DENSE BUT NOT CROWDED:

MAINTAINING A SENSE OF NEIGHBORHOOD COMMUNITY

IN A WORLD OF INCREASING URBAN DENSITY

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Planning)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

April 2021

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the dissertation entitled:

Dense but not crowded: Maintaining a sense of neighborhood community in a world of increasing urban density

submitted by   Eric Douglas   in partial fulfillment of the requirements for

the degree of   Doctor of Philosophy

in   Planning

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Abstract

This study investigates the relationship between urban density and sense of community. In particular, it tries to establish whether residents' sense of community diminishes as density increases, and, if so, what can be done to moderate this relationship. It used an explanatory sequential mixed-methods approach that included an online survey and semi-structured interviews. The findings suggest that there is a negligible relationship between density and sense of community at all density levels except for very dense environments, in which case the relationship is negative. Several types of public space may moderate this relationship, however. Both the survey and the interviews suggest that high-quality parks, walkways, and community centers may increase residents' sense of community.

Lay Summary

With more and more people moving to cities, and with cities becoming more and more dense, are we squeezing the life out of our neighborhoods? Or, are there ways that our cities can accommodate growing populations and also provide excellent neighborhoods? Can we offer ever more people a higher quality of life in our urban environments? If so, how?   The purpose of this study is to investigate the relationship between urban density and sense of community. While sense of community is only one aspect of a person's quality of life, it serves as a fairly good proxy for quality of life in general. When we feel at home in our neighbourhood and comfortable around our neighbours, it makes the good times better and the tough times easier to handle. In a world of increasing density, sense of community is a great thing to have.

Preface

The entirety of this research was designed, performed, analyzed, and described by the author alone. No part of this thesis has been previously published except for citations that have been properly referenced. This research was approved by the UBC Behavioral Ethics Research Board (id# H17-02209).

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Acknowledgements

Thanks to my wife, Teresa, for suggesting I get a PhD (because she recognized I needed something to do), and for then supporting me through the many years it's taken to get it. Thanks to my advisor, Dr. Maged Senbel, for his guidance and patience. Thanks to Dr. Penny Gurstein and Dr. Nathan Lauster for agreeing to serve on my committee. Thanks to Dr. Scott McIntyre for guidance regarding my quantitative analysis. And, thanks to my colleagues in the School of Community and Regional Planning and my neighbors in Acadia Park for the many lively and enjoyable discussions, debates, and conversations. The ride's been bumpy but the scenery not without merit.

Chapter 1: Introduction

Many contemporary urban designers advocate "compact city" principles for North American urban areas (Farr, 2007; Hester, 2006; Duany et al, 2010; Calthorpe, 2011). These principles include walkability, dense clusters around transit nodes, and high-density mixed-use development (Talen, 1999). Benefits of compact city design may include increased social interaction (Raman 2010), lower carbon emissions (Calthorpe, 2011), and improved access to amenities (Hester, 2006). However, the increased density of such compact city design has also been associated with several negative effects, such as increased aggression (Evans 2000), decreased privacy (Evans et al. 1989), and decreased neighborhood satisfaction (McCarthy & Saegert 1978).

While researchers have studied residential density's relationship with many conditions, one association that has not been sufficiently explored is the relationship between high-density residential areas and residents' sense of community. Putnam (2000) showed a relationship between low-density suburban neighborhoods and reduced sense of community (although he also showed it was difficult to theorize a specific causal relationship from the data he used). Other researchers have considered the association between higher-density areas and sense of community, but these were just higher-density sections of low-density areas (Wilson & Baldassare 1996; French et al. 2014). Also, their results were inconclusive. Researchers have investigated factors that may influence sense of community, such as community empowerment (Amad et al. 2016), sense of place (Wise 2015), diversity (Neal & Neal 2014), neighborhood associations (Kingston et al. 1999), and social capital (Long & Perkins, 2007). Other studies have investigated how the built environment in general may influence sense of community (Jung et al., 2015; Ebrahim, 2015; Kaźmierczak, 2013; Francis et al., 2012; Schwaller, 2012; Talen, 1999). While much has been written about urban density and sense of community separately, few studies have sought to link these topics empirically.

Interest in the concept of sense of community among sociologists, community psychologists, and city planners has grown since Sarason (1974) popularized the term. Chavis et al. (1986) provided further theoretical structure to the definition of sense of community by claiming that the construct required four elements, namely, *membership*, *influence*, *shared values*, and *shared emotional connection* (also McMillan & Chavis 1986). Researchers have

associated sense of community with several personal and societal benefits, such as improved mental health (Hall 2017; Davidson & Cotter 1991; Pretty 2006), reduced crime (Jacobs 2011), and resiliency after disasters (Wickes et al. 2015). Others have noted potential hazards, such as exclusion (Halamova 2016), rigid conformity (McMillan & Chavis 1986), compromise of personal safety or values (Sense of Community Partners 2004), lack of diversity (Walker & Ravel 2017), and compromise of solidarity to other groups (Pretty et al. 2006). While planners tend to assume that building a sense of community is a beneficial endeavor and somehow within their purview (www.planning.org), it is unclear when this effort is appropriate (some people would rather be left alone (Brower 2011)), whether the effort is specially challenged in high-density areas (and why), and, if it is, what may and should be done about it and by whom.

Given the interest among North American city planning departments in both compact design and community building (Brower 2011), it is important to fill the gap in understanding regarding the relationship between high-density development and neighborhood sense of community. This study considers this relationship, as well as built environment strategies that may affect sense of community in high-density neighborhoods. My intent is not to question whether cities should become more compact, but rather to understand possible negative ramifications of this process and what might be done to ameliorate or alleviate them. As cities continue to develop high-density neighborhoods, understanding the associated effects on sense of community, and strategies to address them, will continue to be relevant.

Problem statement

Some urban theorists have contended that compact neighborhoods generally create a stronger sense of community among residents than do low-density suburban neighborhoods (Talen, 1999). Sense of community refers to an individual's perception that she feels connected to her community, feels invested in it, and feels a shared set of goals with her neighbors (Ebrahim, 2015). Sense of community has been shown to have several societal benefits, such as civic involvement (Sense of Community Partners, 2004), emotional wellbeing (Hall, 2017; Lardier et al. , 2017; Francis et al., 2012), perception of safety (Sense of Community Partners, 2004), and community resilience (Walton 2016). While New Urbanism theorists have argued that very low residential densities negatively correlate with sense of community (Audirac, 1999), they do not discuss the potential negative effects of very high densities on sense of community. High urban

residential density brings potential benefits (such as increased return on investment for developers, increased housing options for residents, and reduced environmental impacts), but it may also diminish a neighborhood's sense of community if the urban form it requires reduces, rather than increases, opportunities for residents to interact (Francis et al., 2012). For example, highly dense environments, such as apartment towers, may afford little opportunity for neighbors, even adjacent neighbors, to interact.

Although sense of community can form in virtual (online) environments, *neighborhood* sense of community tends to require some form of direct, in-person interaction (Francis et al., 2012). If it is the case that high residential density leads to a lack of semi-public space in which residents can interact, and if it is true that the resulting lack of interaction leads to a loss of sense of community, then sense of community would clearly be a casualty of increased density. It is, therefore, critical to examine the relationship between sense of community and density, especially with a view to understanding public space strategies intended to encourage sense of neighborhood community in high-density environments, if we wish to ensure that density and sense of community are compatible.

State of the field

Researchers have discussed built environment design strategies specific to both high-density environments (Lehman 2016; Moroni 2016) and to sense of community (Walton 2016; Ebrahim 2015), but there has been almost no discussion in the literature attempting to bridge these two concerns (Francis et al. 2012; Talen 1999). I have found no studies that have examined the relationship between sense of community and increasing density in high-density environments, nor studies that discuss the role of various types of public space in enhancing residents' sense of neighborhood community in high-density environments. While no published studies have sought to establish this relationship directly, many studies have shown an association between high-density environments and outcomes, such as aggression and withdrawal, that researchers commonly consider antithetical to sense of community (Cramer et al. 2004, Evans 2003, Boyko & Cooper 2011, Burton 2000, Audirac 1999).

Research objective

The primary objective of this study was to investigate how residents' sense of community relates to increased density in high-density urban environments. A secondary objective was to

investigate how public space can increase residents' sense of community in high-density urban environments. Results of this study may inform stakeholders interested in providing, maintaining, using, or understanding high-density urban environments in which residents experience a high sense of community. Such stakeholders may include design professionals (such as architects), regulators (such as city planners), housing suppliers (such as developers), and researchers (such as environmental psychologists and community psychologists).

Key research questions

The primary question of this study is, **How does population density relate to residents' sense of neighborhood community?** Derivative questions include the following:

- Does sense of community tend to diminish in high-density neighborhoods?
- If so, is this tendency due to a lack of opportunities for residents to experience informal meetings?
- If so, can developers and planners increase sense of community with the thoughtful addition of public open space?
- Finally, what other factors might mitigate any potential negative effects of high density on sense of community?

Note that these derivative question are predicated upon the relationship I expected to find.

Personal Interest

During my architectural training, I took special interest in how the built environment could provide venues for people to interact. As part of my planning education, I also learned about the value of public space and the importance of providing pedestrian-centric infrastructure. So, it was with particular delight that I moved into my current neighborhood, Acadia Park, the student family housing section of the University of British Columbia. Here, for the first time, I was able to experience a pedestrian-oriented master-planned community. It was as if the ideas on which I had been academically raised but could never find architecturally expressed had finally been put to use. I was also delighted to find that the area seemed to work just as the architectural and planning theorists imagined. My neighbors seemed to have something. What was it? Yes, they enjoyed being here, but there was something more. Over time, I came to understand this 'something more' as 'sense of community' and learned that it was a real thing, a thing that

people studied. I wanted to study it, too. I wanted to know if the ideas that I had learned in school—that good urban design could create better living experiences—had a real basis.

But, I also wanted to know about density. The university has a long waiting list of students who would like to live on campus, but have no place available to them. The university is currently investigating how many new units it can build on its remaining land. It is even considering demolishing Acadia Park to make way for denser housing. This brings up the question, if there are aspects of Acadia Park that make it a "high quality"[1] area, what are those aspects, and can they be applied to a neighborhood that accommodates more people? Or, how dense can one make Acadia Park without losing what Acadia Park is? And, more generally, how can we build better neighborhoods that accommodate more people? How can we provide more and better housing?

These were some of the thoughts that got me started on the topic of this thesis. What follows is what I found out.

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[1] Ideally, aspects that we can identify with the concept of "quality" without going mad (Pirsig 1974).

Chapter 2: Literature Review

Architectural affordance as a theoretical framework

This investigation into the relationship between sense of neighborhood community and urban density exists within the more general inquiry into the relationship between quality of life and the built environment. I find this investigation compelling because I am interested in understanding how to improve quality of life through changes to the built environment. Further, I believe this research is topical because more and more people are living in increasingly dense environments. These dense environments create conditions that some research has suggested may prove challenging to residents' sense of community (Cramer et al. 2004, Evans 2003, Boyko & Cooper 2011, Burton 2000, Audirac 1999, Baldassare 1982, Nguyen 2010). Yet, the *explicit* relationship between density and sense of community remains poorly researched and poorly theorized. This study seeks to fill this gap in knowledge by investigating this relationship.

The findings of this research may include applications in theory, practice, and industry. An application to industry might be the question, '*How much non-rentable/non-salable space should a developer set aside in a housing project for amenities?*' An application to (planning) practice might be, '*What concessions should a city require of a developer who wishes to increase the density of a residential tower above that allowed by typical zoning law?*' An application to theory might be an argument as to whether physical design decisions (such as a provision of public space) are able to influence human values (such as sense of community). A commonality across this range of inquiries is that we must assume the ability of the built environment to shape people's perception and experience. While commonly taken for granted, this assumption is unproven and, even if true, may represent a chaotic rather than a mechanistic relationship.

Given our intended objectives, we need to find a theoretical framework that allows for a causal relationship between the built environment and human perception. We can begin this search by trying to understand the nature of causal relationships generally. If we can gain this understanding, we may be able to then see which causal framework is most suitable to our research question. Thus, we begin with a discussion of causality.

<p style="text-align:center">***</p>

What is causality? How does one thing make another thing happen? A review of the relevant literature suggests that no one seems to know. We can imagine that there are different kinds of causality. For example, we might distinguish physical causation (one billiard ball strikes another and 'causes' it to move) from psychological causation (an advertisement 'causes' someone to make a purchase) and from social causation (a prominent event 'causes' a population to vote for a particular candidate). But, in all of these variants, we never see the causal mechanism. We don't observe how the electro-magnetic force transfers energy from one billiard ball to another, which aspect of an advertisement tips a person to enter a store he otherwise would not have considered entering, or how an event alters an election. We can theorize about how these mechanisms work[2], but we can never falsify our theories because we can never test them. As 18th-century philosopher David Hume noted, we never observe laws or causes, but from the manifestations and results of them we merely assume causality (Durant 1926). So, perhaps the best we can do is to rationalize that some theories of causality make more sense than others.

An academic search for books and articles on causality returns few fruitful entries. Much of the current literature on causality has little to say about the nature of causality, but rather bypasses this discussion and moves straight to discussions of how to model relationships (for example, see Halpern 2016, Berzuini et al. 2012, Pearl 2009, and Morton & Williams 2010). Yet these causal models are constructed with pre-conceived assumptions about the causality of the relationships (Kleinberg 2012). Research scientists tend to eschew reference to causality, preferring to talk about association and correlation instead (Illari et al. 2011). They may point out that randomization is critical to the identification of causation, but the mere introduction of randomization tells us nothing about the mechanics of causation (Berzuini et al. 2012). In fact, randomized controlled trials, considered in most research fields as the best indicators of causal associations, still give no indication as to the fundamental nature of these associations (Kleinberg 2012). The paucity of attempts to define causality may reflect a fundamental lack of understanding among scientists as to its very nature.

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[2] Little (2011) describes "causal realists" as those who maintain that "we can only assert that there is a causal relationship between X and Y if we can offer a credible hypothesis about the sort of underlying mechanism that might connect X to the occurrence of Y."

Some writers, however, *have* struggled with the problem of what causality is. The most prominent writer on the topic of causality is Hume. He argued that causality had three essential elements, namely, contiguity (cause and effect must be proximate in time), temporal priority (the cause must precede the effect in time), and necessary connection (the effect requires the cause) (Kleinberg 2012). He claimed that causes may be objects, events, or processes (Kleinberg 2012). More recently, John Leslie Mackie has argued that a cause may be an Insufficient but Non-redundant part of an Unnecessary but Sufficient condition (INUS[3]) (Kleinberg 2012). This consideration of sufficient non-necessity brings up the messy potential of "overdetermination," which Kleinberg (2012) describes as a case in which "there are two or more possible causes for an effect and all are present (such that) all causes will turn out to be spurious aside from the earliest.[4]"

Little (2011) defines a cause as "a condition that either necessitates or renders more probable its effect." Kleinberg (2012) also asserts that a causal relationship may be either deterministic or probabilistic, and notes that probabilistic theories of causality may consider the lack of determinacy in a system to be inherent (ontological) or based in limits of observation (epistemic). He also places a distinct emphasis on temporality, noting that a fundamental aspect of causality, though one that is often overlooked, is the time range within which causality may happen (Kleinberg 2012). Still, even these refinements and digressions may be no more than circular tautologies if all they do is tell us that, in one way or another, causes are things that make other things happen (or more likely to happen). But, this was all I could find. So, I still don't know what causality is. And, I don't think anyone else does, either.

Yet, we have to deal with it. We have to assume that causality exists. Most research relies upon this polite assumption. So, how do researchers work around the necessity of causality? Pearl (an often-cited authority on the topic) sees it this way:

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[3] "Unpacking this, we have that:
1. $C \wedge X$ is sufficient for E.
2. $C \wedge X$ is not necessary since Y could also cause E.
3. C alone may be insufficient for E.
4. C is a non-redundant part of $C \wedge X$." (Kleinberg 2012)
[4] Kleinberg (2012) suggests that one way to resolve this problem of causal attribution when multiple causes are involved is to say that a single necessary and sufficient cause would have a significance of unity, but shared causes would have a significance between 0 and 1.

"We view the task of causal discovery as an induction game that scientists play against Nature. Nature possesses stable causal mechanisms that, on a detailed level of descriptions, are deterministic functional relationships between variables, some of which are unobservable. These mechanisms are organized in the form of an acyclic structure, which the scientist attempts to identify from the available observations." Pearl (2009, p. 43)

I would challenge most of these statements, though. How can induction inform the causality involved in a singular event?[5] Does nature really posses stable causal mechanisms, or could the mechanisms be chaotic (or absent, leaving mere chimeras of chance)? Are the relationships really deterministic, or could they be probabilistic[6]? Are only some of the relationships unobservable, or are all of them unobservable? Are the mechanisms really acyclic, or could they be recursive, involving variables that are both influencing and being influenced by other variables? Despite these criticisms, I think Pearl's viewpoint reflects the tacit assumptions of most natural scientists.

But, what can be done for those in the social sciences? They seem to be the most challenged by causality. Theoretical fields, such as mathematics, may perhaps legitimately claim causality (in that the addition of two numbers can be shown to result in the creation of a new one), and physical sciences may be able to make a strong argument of causality based upon the consistencies of associations that they observe among inanimate matter, but social sciences must account for a virtually infinite number of potential variables. A social science researcher, trying to explain the entire string of causality involved when someone reacts to a given stimuli in a certain way (say a child was stung by a bee, started crying, then tried to look brave in front of his friends), might need to account for the causal factors associated with fields ranging from botany to biology to entomology to anatomy to psychology to sociology, along with subfields within each. Where was the real cause of the reaction? What is one to do when none of the causes is observable?

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[5] Causal relationships may be *typical*, applicable universally and generally used for prediction, or *token*, applicable to only a specific instance of a relationship and generally used to explain a past event (Kleinberg 2012).
[6] Pearl (2009) also notes that most causality models express causality in terms of probability.

How much more fraught than a single reaction is the search of causality in a group or chain of reactions[7]? Yet policy research must attempt to do just this, if it is to have relevance (Illari et al. 2011). Unfortunately, political scientists have not invented a methodology to assign causality. Instead, they borrow from the methodologies of the statisticians and economists (Morton & Williams 2010). According to Morton & Williams (2010), the standard experimental approach in political science involves four principles, namely,

     1-designate a target population

     2-apply an intervention

     3-account for confounding variables

     4-randomly assign control and treatment to sample group.

This approach should look familiar to any laboratory technician. It may even produce the best data that can be produced. What it can not do, however, is show causality. This may not be an impediment, depending upon the level of scrutiny the research receives. Still, at some point, every policy position will face criticism. Every policy based on research *should* have *someone* asking the researcher, 'but how do you *know* that x causes y?' The likely response will be a reference to methodology, but, as Illari et al. (2011) note, "causality is at the crux of metaphysical, epistemological and methodological issues in the sciences (and) giving a *methodological* answer to someone concerned about the *metaphysics* of this question, or vice versa, will not help them." (italics theirs)

Further complications for the social sciences include the uncomfortable fact that, unlike epidemiology, causal relationships in sociology may not even have an obvious statistical association (Little 2011), thus knocking the wind out of this primary touchstone of causality in the natural sciences. Also, it is impossible to perform true experiments in real-world sociological

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[7] Tolstoy (2017, p571) confronts this dilemma with respect to the folly of assigning causality to major historical events:

     "When the apple is ripe and falls—why does it fall? Is it because it is drawn by gravitation to the earth, because its stalk is withered, because it is dried by the sun, because it grows heavier, because the wind shakes it, or because the boy standing under the tree wants to eat it?

     Not one of those is the cause. All that simply makes up the conjunction of conditions under which every living, organic, elemental event takes place. And the botanist who says that the apple has fallen because the cells are decomposing, and so on, will be just as right as the boy standing under the tree who says the apple has fallen because he wanted to eat it and prayed for it to fall. The historian, who says that Napoleon went to Moscow because he wanted to, and was ruined because Alexander desired his ruin, will be just as right and as wrong as the man who says that the mountain of millions of tons, tottering and undermined, has been felled by the last stroke of the last workingman's pick-axe. In historical events great men—so called—are but the labels that serve to give a name to an event, and like labels, they have the least possible connection with the event itself."

settings, as one can not observe the same sample both with and without an intervention (Berzuini et al. 2012). The world is not a laboratory. Finally, we should note that some laws that appear universal may instead be localized, like an orderly set of numbers within a larger random string (Svozil 2018). What applies at one level of government or scale of population might be just opposite of the application in another.

What to do? Is there any way forward? The lack of causal observation is even more damaging to the social sciences than to the natural ones because there are more variables and less control. We have to live in the experiment whilst it plays out and wonder what might have turned out if things had been different[8]. We have to study it while it is happening and hope that our guesses are no worse than random. Yes, we can still run regression models and look for correlations, but we can not escape the trite axiom that 'correlation does not imply causation'[9]. This taunting reminder lures us with the promise of a metaphysical escape from responsibility, but offers no clue as to what *does* imply—or, better yet, show—causality.

Unfortunately, this metaphysical pardon doesn't excuse us entirely. We may not understand how causality works, how to observe or demonstrate it, or even what it is, but still we must answer for it. If we look for associations between independent and dependent variables, even variables as complex as density and sense of community, we do so because we expect these relationships to be causal, not random. Otherwise, what is the point of the research? Does or does not the independent variable determine (at least to some extent) the outcome of the dependent one? (If not, why call it *dependent*?) In this sense, causality is inextricably linked to determinism. In another sense, they are, in fact, the very same thing. And, while "causality" has no precedent as a theoretical framework, "determinism" most certainly has. Therefore, is determinism the most appropriate theoretical framework under which to consider our particular research question?

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This study is premised on an assumed relationship between the built environment and human perception/behavior, a relationship that is sometimes obvious and uncontested (as when a locked door impedes entry) and sometimes obscure and subject to debate (as whether a park

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[8] One test for causality involves an evaluation of counterfactuals, or, what would have happened if the proposed causal agents had been different, absent, or abetted or supplanted by other factors (Berzuini 2012).
[9] Of *course* correlation implies causality. That's way we *use* it. It just doesn't *prove* causality. But, then again, neither does anything else.

bench facilitates social interaction). It builds on a rich history of interest in the reciprocal relationship between how societies shape, and are shaped by, their environments. Discussions regarding the influence of the environment on perception and behavior usually fall within the theoretical framework of environmental determinism. This is unfortunate for two primary reasons. First, while environmental determinism has had a long and extensive discussion and produced substantial bodies of literature and thought, the more traditional scope of environmental determinism concerns the primal effects of the natural environment rather than the mediated effects of the built environment. Second, environmental determinism has become tainted with unpalatable political applications (such as justification of colonialism or even ethnic purges) that have left many academics dismissive of the entire corpus of the theory out of hand.

Despite its current unpopularity, the framework under which this study would fall by default is environmental determinism. In the spirit of due diligence, however, we should review whether some other option may be even more appropriate. With our discussion of causality in mind, let us turn to the field of determinism generally, along with several descendent subcategories (including environmental determinism), to see which linkage between the built environment and perception might be most appropriate for our current needs.

Determinism involves one phenomenon being determined, in whole or in part, by another. A strict deterministic doctrine would hold that one condition (or set of conditions) is both necessary and sufficient to determine another[10] (Faubion 2008) and that "all events, without exception, are just effects" (Honderich 2005). While determinism provides a basis for understanding causal effects of environmental conditions, it connotes a fatality that has little application to the intent of the inquiry of this study.

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[10] A philosophical debate concerns whether human free will can be completely subsumed by external factors that predetermine human actions. Philosophers have argued (though not necessarily using the word 'determinism') that human actions result primarily, or exclusively, as a result of an omniscient deity (Luis de Molina (1535–1600), Baruch Spinoza (1632–1677), Gottfried Wilhelm Leibniz's (1646–1716)), of a relentlessly mechanistic universe (Galileo Galilei (1564–1642), Rene´ Descartes (1596–1650), David Hume (1711–1776), Immanuel Kant (1724–1804), Pierre-Simon de Laplace (1749–1827)), or some combination thereof (Chene, 2004). While there could be many potential types of determinism, only a few (such as theological, physical, environmental, cultural, sociological, technological) have received serious discussion (Faubion 2008) (though Ballinger (2008) would counter that most of these 'determinisms' are false, in that they are themselves influenced by outside sources, and, thus, not deterministic because they are not first causes). Advocates of strict determinism may consider the human mind to be indistinguishable from the human brain, a complex machine that produces a series of electro-chemical responses that would be predictable if all of the inputs could be known (Osborne 2005).

Physical determinism, a sub-category of determinism, builds on the principle of universal laws of motion and extrapolates these, to varying degrees, to the idea that all actions and consequences can be derived from the positions and motions of physical entities (Chene 2004). For example, according to Laplace, "Given for one instant an intelligence which could comprehend all the forces by which nature is animated and the respective situation of the beings who compose it...for it, nothing would be uncertain" (Laplace 1814/1951, p. 4 as quoted in Moxley 1999 p 100). Leibniz held that the universe, given a sufficient knowledge, was as predictable as the motions of billiard balls. (James Clerk Maxwell (1882-1969), on the other hand, countered that the predictability of simple, stable systems did not necessarily extend to complex unstable ones (Moxley 1999)). While the question of whether we live in a predetermined universe receives little attention among contemporary theorists, it has received much attention in the past. Philosophers who address physical determinsim have generally fallen into one of three camps: determinism (human actions result directly from universal laws), libertarianism (human actions result from uninfluenced free will), or compatibilism (universal laws are compatible with free will) (Honderich 2005, Ernste & Philo 2009). Like determinism, physical determinism carries a fatalistic implication and takes little interest in the social dimension, making it poorly suited to this study.

Environmental determinism more directly focuses on the balance of influence between the environment and individual free will. For those who assume that the environment is subject to predictable forces, environmental determinism may be seen as a subcategory of physical determinism, (itself, as noted, a subcategory of determinism). As with physical determinism (and determinism generally), environmental determinism can be viewed from a deterministic, libertarian, or compatibilistic perspective (Ernste & Philo 2009). Although environmental determinism engages and draws from many fields, it has fallen most directly within the field of geography, "the field that has the longest sustained record of engagement with questions of human-environment relations" (Meyer & Guss 2017). Definitions of environmental determinism include arguments that social and cultural features such as creativity, productivity, and diversity result only from environmental factors (Thomas 2008, Johnston 2009), that "human existence and society, arguably including everything from settlement to language, (can) be determined by prior and external natural environmental conditions" (Ernste & Philo 2009, p 102), and that "human activity, culture, and physical and mental characteristics are, at once, informed and

inhibited by the geographical and climatic conditions of the physical environment" (Keighren 2015, p 720). However, according to Meyer and Guss (2017, p 5), environmental determinism need not be fatalistic, but can be defined as merely "treating the environment as a factor influencing human affairs independently and from the outside." Others have provided similar non-fatalistic definitions, proclaiming that environmental determinism "treats the environment as a separate, simple cause or 'factor' not mediated by culture: something external to culture and influencing it from the outside" (Blaut 1993, 69 as quoted in Meyer and Guss 2017, p 6), or that it sees the natural environment as "an active factor exerting simple and direct causal influence on human life" (Platt 1948, 351 as quoted in Meyer and Guss 2017, p 6).

Although ideas and mythologies relating the physical environment to social and cultural development date from antiquity, environmental determinism, as it developed in Western thought, traces its ancestry to such thinkers as Hippocrates of Cos (c.460–377 BC), Aristotle (384–322 BC), and Strabo of Amaseia (c.63 BC–AD 23) (Keighren 2015). Aristotle, seeking to explain the superiority of Greek civilization, suggested relationships among climate, race, and intelligence (Keighren 2015)—a suggestion that would later influence, and then taint, environmental determinism in the 19th and 20th centuries. More recently, the idea that climate and availability of natural resources strongly influence the evolution and capabilities of living organisms developed with the writings of Jean-Baptiste de Lamarck (1790–1869), Thomas Malthus (1766–1834), Charles Darwin (1809–1882), and Alfred Russell Wallace (1823–1913) (Thomas 2008). These writers strongly influenced early advocates of environmental determinism including Friedrich Ratzel (1844–1904), Ellen Churchill Semple (1863–1932), Ellesworth Huntington (1876–1947), and Griffith Taylor (1880–1963) (Fellman et al. 2009).

While highly influential in the 19th and early 20th centuries, and with some notable recent exceptions (such as Diamond 2017), geographers and other social scientists have generally rejected environmental determinism since the mid-20th century (Keighren 2015, Meyer & Guss 2017). The primary point of contention for many has been the application of the theory, rather than newly-discovered flaws in its internal logic (though there have been some). For example, the idea that a scientific rationale explained the disparities in levels of civilization, prosperity, and sophistication of societies based on geography provided a justification in the minds of some for the exploitation and subjugation of 'primitive' societies (Thomas 2008). This rationalization resulted in an academic backlash against the theory behind it.

In addition to the exploitative applications of environmental determinism in the early 20th century, changes in dominant perceptions of the physical universe also eroded its perceived legitimacy. The rigidly causal form of determinism that borrowed legitimacy from a mechanistic, Newtonian view of the universe suffered from the indeterminate nature of quantum physics as it ascended to prominence in the mid-20th century (Ballinger 2008). It would no longer do to compare the determinacy of human actions to the determinacy of billiard balls if the billiard balls might take unpredictable routes. The theory has also been attacked for a lack of tangible evidence. Ewing et al. (2016), in their critique of studies claiming that the built environment affects travel behavior, note that most of these studies are cross-sectional and thus lack a theoretical basis for claiming causation. They further note that non-built environment factors (demographic, social, economic, etc.) may also be influential, or even exclusive, behavioral determinants. Of course, this has always been the primary counterargument, or, rather, counter position, to environmental determinism. Other counter positions include humanism, which argues that human ingenuity can overcome the natural environment, and materialism, which argues that societies and environments co-produce one another (Johnston 2009). A further challenge to environmental determinism is the varied nature of human response at both the group and individual level. Theories such as post-colonialism, feminism, and intersectionality (Crenshaw 1991, Crenshaw 1989) strongly challenge the concept that people react in a universal way to a given stimulus.

Criticism of physical determinism may be mild (accepting the premise but claiming its effects are minimal), limited (for example, accepting that built environment effects are substantial but challenging the interpretation of the effects), or severe (claiming that built environment effects are insignificant or non-existent) (Jabareen & Zilberman 2017, Gans 2017). Franck (1984) points out four specific areas in which she considers physical determinism to be vulnerable to criticism, namely, 1) an exaggerated claim of influence of the built environment, 2) an assumption of only direct effects, 3) ignoring people's capacity to exercise discretion, and 4) ignoring people's ability to modify their environment. She suggests a remedy to such totalizing claims is to consider the influence of mitigating factors when investigating built environment influences.

While a strict, fatalistic, version of environmental (or any other type of) determinism is unlikely to enjoy a renaissance, the basic concept of environmental influence is unlikely to

disappear entirely, either. Environmental determinism can still refer to environment/social relationships that are merely influential, or even mutually influential (Meyer & Guss 2017). Also, concerns about the effects of climate change on humanity have brought a renewed interest in environmental determinism, even if this specific phrase is not used and if the locus of concern has shifted from the field of human geography to the field of paleoanthropology (Livingstone 2012). Still, the emphasis on first cause and universal reaction leave environmental determinism more in need of qualification than I would prefer. Before we abandon it entirely, though, we should consider whether modified versions, such as possibilism and probabilism, reconcile its deficiencies sufficiently to adopt it for our purposes.

Possibilism represented a counterpoint to environmental determinism. Advocated by writers such as Lucien Febvre (1878–1956), Paul Vidal de la Blache (1845–1918), Jean Brunhes (1869–1930), Isaiah Bowman (1878–1950) and Carl Sauer (1889–1975), possibilism emphasized free will over fatalism, yet retained an assumption of environmental influence (Fellman et al. 2009). It promoted the idea that, while environments offer a range of possibilities and opportunities from which people may choose, it is primarily human decisions and actions, rather than influences of the natural environment, that shape culture (Herbert 2014, Sullivan 2009, Johnston 2009). Possibilism was introduced by Vidal de la Blache in the late 1800's as a framework for the field of geography that did not rely on strict environmental deterministic explanations of human development (Berdoulay 2009). It was further popularized by Febvre, who claimed that "there are no necessities, but everywhere possibilities; and man, as master of the possibilities, is the judge of their use" (Febvre 1932 p 27 as quoted in Johnston 2009, p 560). Despite its being a response to the increasingly unpopular theory of environmental determinism, possibilism failed to gain nearly as much attention as its rival, perhaps because geographers and other social scientists had abandoned the discussion entirely, and perhaps because "possibilism seemed to threaten the very raison d'etre of geographical study...by reducing it to...sociology with some locational reference" (Spate 1958). However, this study, like geography, is inextricably linked to location and the relationship of location and society, thus making possibilism (in addition to its lack of theorization) poorly suited as an underlying theory. Others who found possibilism lacking responded with the theory of probabilism, in a sense, the sysnthesis of possibilism (as antithesis) and environmental determinism (as thesis).

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Probabilism is "a thesis about the relationship between culture and nature, which proposes that while the physical environment does not determine how human societies will react to its influence, it renders some responses more likely or probable than others." (Johnston 2009) The concept of probabilism was introduced by O.H.K. Spate (1911-2000) in 1952 as a middle ground between determinism and possibilism. While he made a clear distinction between environmental determinism and the free-will-acknowledging probabilism, his distinction between probabilism and possibilism was less defined, the main argument being that not all possibilities are equal—the environment renders some options more probable than others (Flowerdew 2009). Spate criticized possibilist geographers of "writing sociology, without sociological techniques" (Flowerdew 2009 p 449)

Although simplistic in summary, probabilism has room for nuance and application in several fields[11]. A probabilistic view of the world may be either subjective (epistemic) or objective (ontological) in that it may assume either a randomness based upon incomplete knowledge or one that is inherent in the workings of our universe (Duus-Otterstrom 2009). Empirically, both conditions look the same, but, theoretically, the difference is fundamental. For example, a researcher might observe a bus stop for several hours and notice that half of the passengers sat and half stood. However, she would have no way of knowing from her observation whether the presence of a bench predestined exactly half of all passengers to sit, whether it predestined a different percentage to sit that she would have discovered had she looked longer, whether it predestined a range of sitting percentages that included the percentage observed, whether the percentage were a necessary product of all factors involved at that particular time and location, or whether the observation were a simple fluke. The answer to what she would have actually observed could only be theoretical, not empirical.

Despite reconciling many of the conflicts of both determinism and possibilism, probabilism suffered even greater disregard than its predecessors. There are many potential reasons that probabilism did not gain a wide acceptance at the time: It suffered some of the drawbacks of both previous theories without fully reconciling the failings of either; it was a

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[11] A strain of probabilism applies to the field of ethics, wherein one may be ethically compelled to act contrary to one's conscience if the preponderance of one's expert peers holds a belief different from one's own (Schwartz 2014). Environmental risk managers may follow a deterministic rationale, evaluating all possible hazards solely upon their potential outcomes, or a probabilistic rationale, weighing hazards as products of both their potential outcome and their probability of occurrence (Basta 2014).

response to a response to an issue that had generally died in the minds of its primary guardians and thus spoke to an issue that no one still found compelling; it could be interpreted as simply a clarification of possibilism, rather than a competing theory; and, human effects on the environment were becoming a more immediate concern than the obverse (Flowerdew 2009). Also, it was not necessarily a repudiation of determinism since probability may, in fact, simply be determinism viewed at a larger scale. Duus-Otterstrom (2009) notes that "even if we settle for explaining patterns of outcomes, it might be that what on aggregate adds up to probabilism is the effect of complete determinism on the level of the individual case." Finally, the move from determinism to probabilism does not necessarily make room for free will, since the odds of someone taking a certain action may be just as fixed as the certainty of the person doing so. Contrariwise, the probability of a number of people in a group holding a given opinion may not necessitate the probability of any member of the group believing it (Duus-Otterstrom 2009).

Probabilism has the potential to be a useful tool in theorizing the relationship between society and environment. It can tap into the legacy of discussions surrounding its antecedents without evoking the viscerally antagonistic response associated with environmental determinism. However, it may also suffer from a lack of depth in its own right, saying nothing of real importance (such as that 'some things make other things likely to happen'). Further, it still focuses on the unidirectional relationship of environmental effects on society, tending to ignore reciprocity. More useful to many studies involving the built environment would be an accounting of how cultures and their environments influence each other. For example, Alexander von Humbolt (1769-1859), in his book *Kosmos*, discussed the reciprocal and inter-related nature of society and the environment. He viewed nature as influencing, rather than determining, human actions and considered how human actions, in turn, might influence environmental systems (Keighren 2015). Unfortunately, this thinking did not spawn a following and, to date, the socio-spatial inter-relationship does not have a substantial body of theoretical literature, despite the tacit assumption of its existence in many fields, such as architecture. While probabilism reconciles some aspects of environmental determinism, it fails to address the reciprocal nature of society and the environment, and gives only marginal differentiation between the built and the natural environment, making it only marginally useful for this study.

One field that attempts to address the relationship between humans and the built environment is "environment-behavior studies." Rappoport (2008) discusses environment-

behavior studies and notes that it has gained little traction. He traces the origins of environmental-behavioral studies to the 1960's, growing out of "dissatisfaction with the lack of knowledge about how people and environments interact," and cites three primary questions that it seeks to address, namely,

> "*(1) What bio-social, psychological, and cultural characteristics of human beings...influence characteristics of the built environment?*
> *(2) What effects do which aspects of which environments have on which groups of what sets of conditions, and why?*
> *(3) What are the mechanisms of these two-way interactions between people and environments?*" (p 277)

While there is considerable interest in environmental design research (as evidenced by such bodies as The Environmental Design Research Association (www.edra.org), the International Association of People-Environment Studies (iaps-association.org), and the Man-Environment Research Association (www.ebs-net.info)), the field lacks a substantive body of theoretical literature (Rappoport 2008). This may be due, in part, to the highly interdisciplinary nature of the fields and topics involved in understanding the reciprocal relationship between humans and their built environment (Demsky & Mack 2008). It would be helpful to have a robust body of theory discussing the dialectic between society and its use of space. Soja (1980) discusses what he calls the Socio-Spatial Dialectic, but his interest focuses on Marxist spatial analysis rather than a more general discussion of the reciprocal influences on each other of society and urban space. So, if we can not find a body of theory that discusses a reciprocal relationship between society and the built environment, can we at least locate a discussion that emphasizes the built, rather than the natural, environment, even if it means a return to determinism? In fact, we can, if we turn to architectural determinism.

Architectural determinism, a sub-category of environmental determinism, argues that the built environment influences behavior, either directly, through constraint or opportunity, or indirectly, through subliminal pedagogy or mnemonic devices—the later enjoying far less consensus than the former (Pop 2014). There is a robust history of architects and planners who attempted to influence society by means of the built environment. Jabareen & Zilberman (2017) trace modern interest in architectural determinism to architects and urban designers such as Clarence Perry (1872-1944), Le Corbusier (1887-1965), Walter Gropius (1883-1969), Frank

Lloyd Wright (1867-1959), and Ludwig Mies van der Rohe (1886-1969). Other notable figures in this realm include Frederick Law Olmsted (1822-1903), who sought to uplift the lower-class masses of New York City by providing them a venue (Central Park) in which to view their more refined urban counterparts, Daniel Burnham (1846-1912), whose City Beautiful movement was intended to purify society through the construction of elegant structures, and Ebenezer Howard (1850-1928), whose Garden Cities were to cure social ills and make society more productive (Riggs 2014). Although usually well-intended, architectural determinism has also had questionable applications, such as the attempt of Jesuit priests in 19th-century Montana to change the culture of the local American Indian population through the use of architectural and spatial interventions (Van west 1987).

Despite widespread acceptance among practitioners of the behavioral and perceptional effects of design[12], the theory of architectural determinism is backed by little empirical data, largely because post-occupancy evaluations are rarely commissioned and thus purported design benefits are rarely verified (Marmot 2002). While some studies, such as Newman's (1973) investigation of tenement buildings' negative effects on residents, make a strong argument for the validity of environmental influence, others, such as Atlas's (1982) study of the relationship between spatial and architectural factors and rates of violence in prisons, find that cultural variation seems to have greater explanatory power than do living conditions. Thus, not only does the degree of influence of environmental design on behavior remain unresolved, so does the question of whether this influence even exists. Finally, there is the ethical imperative to consider--architects and planners often proceed under the general assumption that thoughtful and skillful adjustments to the built environment can make the world and the people in it better off (Gans 2017, Lang & Moleski 2010), but this requires the dual assumptions that people's lives need improvement and that it falls to the architect or planner to effect this improvement (Broady 1966, Simon 2016).

Its failings (a lack of theoretical articulation, a paternalistic legacy (and perhaps a paternalistic nature), a lack of serious discussion and debate, a lack of empirical findings, and a lack of successful application) notwithstanding, architectural determinism comes closer than competing theories to describing the relationship between the built environment and society that

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[12] According to Broady (1966, p173), architectural determinism is "more often found implicit in architects' thinking than in any clearly argued form: and it is probably the more dangerous for that."

I am seeking to explore. It might be useful to combine the ideas of architectural determinism and probabilism, but architectural probabilism might not afford any insights that could not be accommodated by architectural determinism (which carries no significant historical burden of fatalism). It would also be more helpful to have a theory that considers the wider built environment (architecture, to me, connotes a limitation to buildings) and that addresses the type of reciprocity between people and the environment that Rapporport considers. But, again, such a theoretical discussion seems to be lacking in the literature. Therefore, within the context of the above critiques, considerations, and disclaimers, it seems that architectural determinism may be an appropriate existing theoretical framework to use to consider the effects of urban density on people's perception of their neighborhood and of their quality of life. Is it also appropriate as a framework for considering sense of community?

While this study will involve several variables (sense of community, perception of density, fear of crime, etc.) each with its own body of related theories, the primary issue it will seek to address involves the relationship between the built environment and people's individual and collective responses to it. Several studies suggest connections between built environment features and social interaction (Talen 2000). A review by Talen (2000) of planning documents of twenty major U.S. cities found that such documentation showed a general acceptance that the built environment could increase sense of community through facilitated social interaction. However, the *mechanisms* by which the built environment may influence sense of community remain poorly theorized (Moustafa 2009) and researchers have found little empirical evidence linking any specific feature of the built environment to any specific component of sense of community (French et al. 2014). As Kingston et al. (1999) note, it may be that sense of community is determined solely by individual characteristics, such as a personal desire for interaction, or by socioeconomic status, rather than directly by any environmental factor. Parsing which factors contribute to sense of community is difficult, and attributing the portion for which the built environment is responsible is even harder.

Researchers have produced inconclusive and contradictory assessments as to whether the physical environment can affect sense of community at all (Jung et al. 2015; Ebrahim 2015). Despite a growing body of popular and academic literature linking New Urbanist design principles to sense of community, there remains a paucity of empirical evidence to support this link (Talen 1999). Even if urban design can influence social interaction, it is unclear how much

social interaction alone influences sense of community (Talen 1999). Talen (2000) highlights three practical limitations to the link between physical design and aspects of community: 1) most research examines effects on social interaction as a proxy for sense of community rather than on sense of community directly, 2) most research has focused on the scale of sites rather than of neighborhoods, and 3) most research considers only indirect effects of the built environment rather than aspects of the built environment directly. Supporting this last point, a study by French et al. (2014) showed that residents' perception of their neighborhoods were more closely associated with their sense of community than were objective measures of environmental characteristics (see also Francis et al. 2012). Also, neighborhood design elements that do increase sense of community may do so indirectly by encouraging a homogeneous population rather than directly by facilitating interaction (Talen 1999). While some studies seeking to understand psychological effects of physical typologies fail to account for non-physical factors (Jabareen & Zilberman 2017), other studies emphasize them, supporting the notion that neighborhood residents have been 'liberated' from the need to make social connections within their neighborhood (Talen 1999).

Given the multiple proposed components of sense of community, including shared emotional connection, neighborhood attachment, membership, influence, reinforcement, and sense of place, it is unclear to what extent these all might be affected by simply facilitating random encounters among residents with strategically placed public space (Talen 1999). A study by Jabareen & Zilberman (2017) found 13 percent of variation in sense of community due to physical typologies (design, compactness and transportation), 13 percent due to a demographic factor (length of residence), and 19 percent due to the socio-cultural perception of trust. Expectations of increasing sense of community by providing nearby social space may be misguided if they fail to predict residents' preferred methods of finding companionship and associated barriers to doing so (Broady 1966). Notions of spatial determinism that predict an association between sociability and proximity presume that residents put a high "spatial cost" on relationships that are far away, and this may not be the case (Talen 1999). While architectural determinism may provide a venue for such criticisms, it does little to provide a meaningful response to them.

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Another way of conceptualizing the relationship between the environment and users of the environment was proposed by James Gibson in the 1970's with his theory of affordance, which moved away from determinism by imbuing animals with agency (Withagen et al. 2012). Gibson rejected the behaviorist idea, popular at the time, that animals had little choice in how they reacted to their environments. He suggested, instead, that objects in the environment provide various opportunities to animals that entice them to respondent actions. He extended this theory to humans and noted that, particularly with humans, this relationship could be reciprocal. "Why has man changed the shapes and substances of his environment?" he asked. "To change what it affords him." (Gibson 2015, p122) But, what, exactly is an affordance? What does the term "affordance" mean?

Gibson introduced the term "affordance" in 1979, in his book, "The ecological approach to visual perception." According to Gibson,

> "The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes,* either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment." (Gibson 2015, p119, emphasis his)

Although researchers universally credit Gibson with coining the term, they have not all accepted his definition without modification. According to Norman (2013), affordances are relationships between physical objects and people. Evans et al. (2017, p. 39) also consider affordances to "belong...to the relationship between individuals and their perceptions of environments." There seems to be a general agreement that "an affordance indicates the potential for a behavior, but not the actual occurrence of that behavior." (Maier et al. 2009) There is a lack of consensus, however, as to whether affordances are always helpful. Maier et al. (2009), like Gibson, believe that affordances can be both positive and negative, but Norman (2013) considers objects that prevent or hinder activity to be constraints (though he also refers to them as 'anti-affordances'). Mehan (2017) explicitly extends the influence of affordances beyond activity by arguing that the environment may offer several types of affordances, including physical, social, emotional, and

cognitive[13]. Still, a commonality among all researchers seems to be an agreement that affordances represent ways that the environment influences users of the environment.

Of course, this influence can only take place if the users can perceive the affordances around them, and perception has been intimately linked to the concept of affordance from the outset. In fact, both Gibson and Norman were *primarily* interested in the issue of perception. As noted above, when Gibson introduced the idea of affordance, it was within the context of perception. He claimed that "the composition and layout of surfaces constitute what they afford...to perceive them is to perceive what they afford" (Gibson 2015, p119), and that "what we perceive when we look at objects are their affordances." (Gibson 2015, p126) Norman also was keenly interested in the role of perception in the user/environment relationship as well, though he rejected Gibson's assertion that animals perceive affordances directly. Instead, he believed that "affordancs are not mere opportunities for action, but are *perceived* action possibilities that *suggest* actions to an animal." (Withagen et al. 2012, p. 253, emphasis theirs) Norman (2013) believes that the affordance of some objects can be perceived due to the nature of the object, but that other objects require 'signifiers' to make their affordance known. "Affordances determine what actions are possible. Signifiers communicate where the action should take place." (Norman 2013, p. 14) Do we perceive affordances directly, or do we perceive signifiers and assume that the signifiers represent affordances? Gibson and Norman did not agree on that point.

This disagreement regarding perception is indicative of a more profound lack of consensus regarding the very nature, or ontology, of the concept of affordance. As Greeno asks, "Is the affordance that a chair provides for sitting a property of the chair, a property of the person who sits on it or perceives that he or she could sit on it, or something else?" (Greeno 1994, p. 340) This question is fundamental to our conception of how affordances work. In contrast to Gestalt psychologists like Lewin and Koffka, Gibson believed that affordances exist independently of perception (Withagen et al. 2012). He thought that "'values' and 'meanings' of things in the environment can be directly perceived" and that "values and meanings are external

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[13] Similarly, Montello (2014, p75) posits that "like other physical environments, architecture influences human cognition, experience and behavior by allowing, facilitating, requiring, impeding or preventing various perceptions, thoughts, emotions and acts."

to the perceiver." (Gibson 2015, p119) He gives us a somewhat 'quantum', or, at least, ambiguous description of how he viewed the nature of affordance:

> "An important fact about the affordances of the environment is that they are in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental. But, actually, an affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer."
> (Gibson 2015, p121)

Subsequent researchers have supported Gibson's contention that affordances are objective realities, detached from the perception of users. Withagen et al. (2012) agree with Gibson (and not Norman) that affordances exist even if they are not perceived. They further agree with Gibson that "affordances do not change as the intentions or needs of the actor change (p. 255). Rietveld and Kiverstein also agree, commenting that "affordances are real... in much the same way as colors are real. Both are there independent of any particular individual's action." (Rietveld and Kiverstein 2014, p. 338) The main proponent of the subjective nature of affordances seems to be Norman.

Despite the enthusiasm generated by Gibson's idea, few researchers have done much to advance the theory of affordance or to use it as a theoretical framework in the realm of environmental design. Maier et al. (2009) provide the most comprehensive attempt to apply the concept of affordance to architecture and to explicitly discuss this application as theory. Unfortunately, no one seems to have applied their ideas empirically. Mehan (2017) considers the concept of affordance in his discussion of the public realm and Coolen (2015) suggests using a matrix of affordances as a means of cataloging and evaluating user housing preferences, but neither one tests nor advances the theory. The only example I found of someone using the concept of architectural affordance as a research framework was Bichard (2015), who used it in her thesis exploring publicly accessible toilets. Bichard presents affordance as a more 'elastic' concept than determinism, but makes no effort to elucidate architectural affordance as a theory or to reference any related discussion of the topic other than Gibson.

Thus, the concept of affordance generally and the application of this concept specifically to the influence of the built environment on human behavior remains largely un-theorized. It certainly lacks consensus. Evans et al. (2017) reviewed 82 communication-oriented scholarly works on the topic of affordances and found little consistency among them on how they applied the term. This leaves open for interpretation (and explication) how, indeed, affordance—if it is real—works.

Norman (2013) believes there are six key elements involved in our ability to discover and understand our environment: affordances, signifiers, constraints, mappings, feedback, and the conceptual model of the environmental system. While this may be so, I think we only need a few of these items to describe a system of affordance. I think the flow of influence from environment to environmental user might be represented like this:

environment >	elements >	affordances/ constraints >	agency/desires/ limitations >	user >	feeling/ actions
		signifiers >	perceptions >		

Table 1 - Chain of influence from environment to user

What does this table mean? We can imagine that there is some environment (say, an urban park) with elements in it (say, benches). The elements provide affordances (flat surfaces that afford sitting) and constraints (armrests that make sleeping difficult). These elements also provide signifiers (shape, color, texture, material) that offer clues as to their utility. Within the environment are users who have both agencies (abilities to do things) and desires (such as to sit or sleep). These users also form perceptions about their environment and the elements within it. If their perceptions of the signifiers align with their agency and desires, these signifiers may influence them to take advantage of the affordances (and avoid the constraints) of the elements in the environment. This influence may motivate them to take some action. If it does, the built environment has thus 'caused' behavior. It is this series of connections, this application of affordance to the built environment, that I think we can refer to as "architectural affordance."

What is architectural affordance? I have not found an explicit definition (though Maier et al. (2009) provide thoughtful discussion), so I wish to provide one here:

Architectural affordance is a theoretical framework that posits that the built environment influences human perception and behavior by providing both affordances (opportunities and encouragement to experience some feeling or perform some action) and constraints

(corresponding limitations or discouragement). The environment also contains signifiers[14], some of which correspond to its affordances and constraints, and some of which are perceived by environmental users. These users relate their perception of these affordances and constraints (by perceiving the related signifiers) to their own agency (ability and capacity to feel and act) and desires and then respond with a modified feeling and by acting within the limits of the existing constraints. In this way, the built environment (as with the environment generally) influences human perception and behavior.

This definition is not based on observation, but it is rather a working definition that I intend to describe my understanding of how architectural affordance works. I think it raises several questions in need of clarity. Those questions (and my answers) follow:

- Are affordances always positive?
    - Yes. I believe affordances are always positive ('helpful') to the organism (in this case, the human user) to which they *afford* a feeling or behavior. I reject the idea that affordances can be negative and I reject the idea of "anti-affordances." Instead, I believe the opposite of affordance is constraint. I think that constraints can still fall under the theory of architectural affordance, however, because, generally, the intent of the built environment is to afford action rather than prevent it. Some objects (multiple armrests on a bench) may act as both affordances for some activities (resting arms while sitting) and constraints for others (sleeping on the bench).
- Are affordances inherent?
    - No. I reject the idea that affordances are inherent. This is a minority viewpoint, but it is shared by Norman. I believe the idea that affordances are inherent properties of objects (like color or texture) is easily countered. Consider a bench. Is the affordance of 'sitting' an inherent property of the bench? I say no. It affords no opportunity for sitting to a giraffe or a whale or a person in a wheelchair. It affords no opportunity for anything if it is on the moon or anywhere that users can not apprehend it. There may be an infinite number of

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[14] "Affordances determine what actions are possible. Signifiers communicate where the action should take place.... Signifiers can be deliberate and intentional, such as the sign PUSH on a door, but they may also be accidental and unintentional, such as our use of the visible trail made by previous people walking through a field or over a snow-covered terrain to determine the best path." (Norman 2013, p 14)

affordances associated with the bench (or none), depending on the life forms and personalities that encounter it. But, if you throw the bench into the middle of the ocean, its affordances do not sink with it. They simply cease to exist, and new ones arise as it settles into its new home.

- Are affordances perceived directly?
  - No. Here, again, I disagree with Gibson (and Withagen et al. and Rietveld & Kiverstein) and embrace Norman. I contend that affordances are not perceived at all. In order to benefit from the affordance of a bench, one must perceive that it is associated with an agency and a desire (like sitting, or laying down, or performing a skateboard trick). But *users do not perceive the affordance before they make use of it*. In order to use the affordance, users must first perceive the *signifier*. They must see that the thing that looks like a bench affords sitting. Of course, the bench may not. It may be wet with water or paint. It may be behind a barrier, such as a fence. You may need to buy a coffee in order to sit in that bench. The bench may be hidden from view and need an explicit signifier such as a sign to point out that sitting is available nearby. Also, there may be a boulder next to the bench that would afford sitting just as well as the bench, but the user would have to interpret a signifier associated with the boulder to mean that it affords this activity. And, the bench may afford many other activities that would only be perceived if suggested by signifiers. This brings us to the next question, which is related.
- Do signifiers align with affordances and constraints[15]?
  - Sometimes. Signifiers *tend to* align with affordances and constraints, but there is imperfect overlap. A ramp may be perceived as an affordance for a wheelchair user, but it may still restrict some wheelchair users and it might afford passage for people making deliveries with a dolly. A gate may signify to users that they are not allowed to pass, but it may keep out people who should pass or allow people

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[15] Although beyond the scope of the current discussion, note that this disconnection between signifier and affordance, which I present as primarily functional, harmonizes with the post-modernist aesthetic disconnection between object and symbol in architecture as popularized by Venturi el at. (1972).

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who shouldn't. Thus, the 'signifiers' of the ramp and the gate may *align* with the related affordances and constraints either well or poorly.

- Do users consciously perceive signifiers?
    - Sometimes. When users see a "don't walk" sign, they likely process this on a fairly low level, changing their behavior (walking) without much thought. Another signifier, such as the smell of smoke, may trigger a much higher level of awareness and thought. A feeling of calm in a natural setting or a feeling of reverence in a large cathedral may not be a conscious reaction at all, or such feelings may be heightened by reflection.
- Do affordances and constraints influence perception?
    - Yes. I agree with Mehan (2017) that affordances may influence many aspects of human perception and behavior, including physical, social, emotional, and cognitive conditions. Affordances and constraints, or the signifiers associated with them, may influence both what we do and how we view the world.
- What is the range of influence of affordances and constraints?
    - The built environment offers a full range of influence, from minimal (as an opportunity for a place to sit) to complete (as a jail cell). By their nature, affordances tend to be optional (things you *can* do) and constraints tend to be mandatory (things you *can't* do). Influence may be either directly by affordances and constraints, or indirectly through related signifiers.
- Can we prove a causal pathway?
    - No. Unfortunately, we have still not resolved the conundrum with which we began our discussion, namely, *Can the built environment* cause *human behavior, and, if so, how?* We have, however, suggested a pathway for causality, which puts us, at least, a bit better off than when we started.

These may not be the right answers. The true nature of the relationship between the built environment and human behavior might be nothing like this. It might not even exist. But these are the assumptions I adopt as I present my research.

To close this discussion, I think it is useful to compare the words "facility" and "facilitate." Seeing them together makes me think that the purpose of the built environment (echoing Gibson above) is to make it easy for us to accomplish things. The built environment is

built purposefully to make it easier to stay dry, to sleep, to eat, to learn, to work, and to do whatever else we need to do. Facilities facilitate. Architecture affords. That's why we build it. Several researchers have noted the lack of a working theoretical framework in the field of architecture (Gibson 2015, Maier et al. 2009, Coolen 2015, Broady 1966). The nascent concept of architectural affordance may be able to fill this gap.

Using this theoretical framework, therefore, I wish to explore the primary research question noted at the outset, namely, *"How does population density relate to residents' sense of neighborhood community?"*, along with its derivative questions. I see this question fitting into a hierarchy of human-environment relationships as follow, from general to specific:

➢ How does the built environment influence human behavior and experience?
  o How does the design of a neighborhood affect residents' quality of life?
    ▪ ***How does urban density relate to residents' sense of neighborhood community?***
      • How does public space in a neighborhood (among other factors) moderate this relationship?

To prepare for this research, I spend the balance of this literature review discussing the relevant topics of sense of community, urban density, and public space.

What is sense of community?

The concept of community as used by sociologists, community psychologists, and urban planners relates to a group of people (possibly with some other defining characteristics added). What, then, does it mean to have a sense of this thing? Does it mean that one senses that a group exists? This definition would be insufficient to merit the level of attention the phrase 'sense of community' has garnered over the last few decades. As a sense, of course, it requires a consciousness to sense it. It may, however, be an ubiquitous sense with a nature that many people can agree upon (like the color blue) such that a group may share a common sense of community and have some expectation that its members are experiencing approximately the same feeling. Or, it may be that this sense is experienced differently (if at all) by each person. When people speak of 'building' or 'strengthening' a community, they may be referring to modifying the perception individual members have of their community, rather than increasing a community's numbers or influence (though they could mean these things as well). It is this

perception that people have of their community, usually held to be a positive perception, that is usually referred to in related literature as sense of community. However, the definition, and the theory behind it, deserve a more nuanced consideration.

Most definitions of sense of community involve some combination of notions of belonging, membership, interdependence, support, connection, commitment, empowerment, sharing, and participation, though they may or may not involve location (Ebrahim 2015). Psychological sense of community generally refers to "how an individual perceives his or her bond to a community and the intensity of these ties to the community" (Halamová 2016). According to Sarason (1974 p157) sense of community involves "the perception of similarity to others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, (and) the feeling that one is part of a larger dependable and stable structure." Talen (2000, p174) defines sense of community as "the interrelationship between the individual and the individual's social structure." McMillan & Chavis (1986 p9) state that sense of community is "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together." In a study of sense of community and New Urbansim, Ebrahim (2015 p26) defines sense of community as "social attachment and togetherness experienced by neighbourhood residents and an attachment to place where the environmental experience of this togetherness happens and people's needs could be met." Cochrun (1994 p93) describes sense of community as a psychological construct that refers to "the feeling an individual has about belonging to a group and involves the strength of the attachment people feel for their communities or neighborhoods." Researchers have associated sense of community with neighboring behaviors, political efficacy, walkability, intended length of residence, neighborhood satisfaction, safety, control over one's environment, and community bonds (Johnson & Halegoua 2015). Sense of community is related to "neighboring," which Unger & Wandersman (1985) describe as involving "the social interaction, the symbolic interaction, and the attachment of individuals with the people living around them and the place in which they live." Sense of community is also similar to attachment to place, but with an emphasis on people rather than on location (Unger & Wandersman 1985). In fact, the importance of neighborhood may be contested in studies that focus on virtual sense of community (Abfalter et al. 2012), multiple senses of community (Bahl et al. 2019), or school

sense of community (Prati et al. 2017, Prati et al. 2018, Prati & Cicognani 2019). People with a sense of community feel that they are part of, connected to, and committed to a community whose goals they recognize and are motivated to work together to achieve (Ebrahim 2015). Such motivation is often the focus of studies that consider the related topic of sense of community responsibility (Boyd & Nowell 2020, Yang et al. 2020).

Interest in the concept of sense of community has its roots in feelings of dissociation and alienation associated with 19th century industrialization (Halamová 2016). Literature in the field of community psychology tends to present an idealized notion of sense of community that emphasizes positive community involvement and social support structures (Moustafa 2009). In small town or village settings, sense of community may be an expected by-product of residents' familiarity, shared history, homogeneity, and length of residency, whereas in modern cosmopolitan settings many of these elements may be lacking (Cochrun 1994). Yet, such elements may be more than quaint provincial trappings and may represent actual needs of the human psyche. Baumeister & Leary (1995) reviewed a body of empirical literature to test commonly accepted theories of the human need to belong and found that humans do, indeed, have a fundamental need to belong and that we seek frequent interactions within long-term, caring relationships. Such relationships build social capital. Long & Perkins (2007) propose that sense of community is one of the four elements comprising social capital, along with collective efficacy, neighboring behavior, and formal citizen participation, and that sense of community is the best predictor of these other three elements. Chavis & Wandersman (1990) posit that sense of community can act as a catalyst in community involvement by mobilizing members' perceptions of their physical environment, of their community relationships, and of their own level of empowerment in the community. McMillan (1996) emphasizes the need for community members to feel safe and rewarded by being in the community. He notes that once a group is confident in their similarities and shared goals, the members may then feel comfortable negotiating resolutions to their differences. Researchers have theorized the structure of sense of community. McMillan & Chavis (1986) propose four elements that form the amalgam of sense of community, namely, "membership," "influence," "integration and fulfillment of needs," and "shared emotional connection" (see also Chavis et al. 1986). McMillan (1996) later reframed the four elements of sense of community using more emotive descriptors categorized as "Spirit, Trust, Trade, and Art." Chavis et al. (1986) formulated a sense of community index (SCI) as a

means to empirically quantify the components of sense of community. Several researchers have used some variant of this index to compare sense of community with other variables. It remains, in one form or another, the most commonly used metric of sense of community found in current literature (but see Appendix 'A' for a comprehensive discussion of sense of community measures).

Many elements may affect, and be affected by, sense of community.[16] Studies have associated sense of community with social engagement (Wells et al. 2019, Tang et al. 2017, Talo et al. 2014, Miranti & Evans 2019, Dinnie & Fischer 2020), life satisfaction (Hombrados-Mendieta et al. 2019, Ditchman et al. 2017), empowerment (Ramos-Vidal et al. 2019), and well-being (Prati et al. 2018, Rollero et al. 2014, Jorgensen et al. 2010, Coulombe & Krzesni 2019, Moustafa 2009). Several studies have shown a strong relationship between quality of life and neighborhood social connections (Talen 2000). Researchers have associated sense of community with benefits at many scales, including the individual (better mental and physical health and higher quality of life), the community (increased pro-social behavior and cooperation), and society in general (greater interest and involvement in civic affairs) (Halamová 2016). Studies have associated sense of community with feelings of safety, self-efficacy, and well being and actions such as volunteering, community participation, voting, and helping others (Sense of community Partners 2004). A study by Davidson & Cotter (1991, referenced in Cochrun (1994)) found that sense of community was associated with more happiness, less anxiety, and greater perceived personal life competency (also Farahani 2016). A potential outcome of sense of community is social support, which can be emotional, functional, or informational (Unger & Wandersman 1985). A study by Forsyth et al. (2015) showed a positive relationship between sense of community and environmental engagement. Davidson & Cotter (1991), found strong positive relationships between sense of community and happiness (r = 0.45, 0.19, 0.34), but weaker relationships with worrying (r = 0.06, 0.11, 0.12) and coping (r = 0.16, .016, 0.17). A study by Gattino et al. (2013) found sense of community to be positively associated with the World Health Organization Quality of Life index.

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[16] In this section, I discuss relationships in which sense of community tends to be thought of as influencing something else. In the section 'How does urban design influence sense of community,' I discuss relationships in which the direction of influence tends to be considered as opposite. Of course, these are just organizational conventions. My point in neither section is to establish causality or suggest uni-directionality. I just want to show what people have researched.

Ahmad et al. (2016) found that community projects were more likely to succeed when members felt empowered and had a strong sense of community. In more targeted studies, researchers have associated sense of community among adolescents with such positive outcomes as a more solidified ethnic identity, increased access to positive adult mentors, a reduced tendency to engage in destructive behaviors, increased psychological and social well being, and an increased drive to reduce common problems (Lardier et al. 2017). Mendoza et al. (2016), found sense of community to be the strongest predictor of a college student's tendency to thrive in the campus environment. Farahani (2016) claims that the advantage of neighborhood sense of community is not an ability to provide the highest levels of intimacy but rather the benefits of access and proximity. An argument in favor of this benefit comes from a study that found that socially isolated residents during a 1995 Chicago heat wave were seven times more likely to die from heat exposure than were those with some social network (Montgomery 2013). People with a strong sense of community tend to have healthy feelings of belonging, control over their environment, shared history with fellow members, personal investment in community success, and conviction that their needs can be met through the collective abilities of their community (Cochrun 1994).

While it may be tempting to romanticize sense of community, it would be naïve to imagine that it could never create or exacerbate negative outcomes (Sarason 1974). Communities may be founded, consciously or unconsciously, on constructive ideals such as faith, hope, and tolerance, or on destructive ones, such as fear, hatred, and rigidity (McMillan & Chavis 1986). It is often possible to exploit social cohesion and social capital to nefarious ends (Putnam 2000). The unity of a group is in no way a guarantee of good intentions, harmless actions, or immunity from deception. Even with best intentions, a community member's sense of community must correspond to the nature and values of the community. Some members may consider identification or association with the community to represent a compromise of their personal values or even a reduction in their safety (Sense of community Partners 2004). The conflicts between members' values and their understanding of the community's values may range in severity or may be themselves conflicted (some values may be in harmony, some in minor conflict, and some in fundamental conflict). In a study by Walker & Ravel (2017), the authors interviewed undergraduate students from rural towns about their home communities. They found that the students generally felt a strong sense of community in their home towns, but

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had felt the communities lacked diversity and access to opportunity. The authors speculated that the students may have felt some obligation to remain in their home towns to help preserve the community. In other cases, residents may develop a negative sense of community in neighborhoods they consider to be more of a threat than a resource (Pretty et al. 2006). In addition to conflicts of values, sense of community may have negative effects if the community is in harmony but built on values that are harmful to society at large (such as racism or drug smuggling). In forming a sense of community, it is important to question whether it is based on exclusion of some members of the community and what types of diversity the community may not tolerate (Halamová 2016). Developing a sense of community may be dangerous if members of the community in question have unsupportive or predatory values (Halamová 2016). Such values may surface more readily in cases of severe heterogeneity and a perceived lack of resources. For example, an influx of immigrants may pose challenges to the sense of community of both immigrants and the established community into which they enter (Pretty et al. 2006). A minority group's sense of community may be used against its members by outsiders who are antagonistic toward it because of its ethnic, religious, cultural, or political makeup (Pretty et al. 2006). Close-knit, morally homogeneous neighborhoods may prove harshly judgmental of those it perceives as deviants (Unger & Wandersman 1985). While sense of community has many benefits and is generally perceived as benign, there are darker aspects that we should acknowledge.

Since the phrase 'sense of community' was introduced by Sarason in the 1970's, it has come into popular use and is often used by planners and developers as a positive aspect associated with a location. While I have attempted to show a comprehensive range of definitions and applications of sense of community in recent literature, the purpose of this larger research project is not to engage in disambiguation of the term or to explore all applications of it. Rather, the focus, as noted earlier, is on the relationship between sense of community, as broadly defined above, and urban density, as broadly defined below.

How do we react to urban density?

Increased density and compact urban development have become widely accepted goals among city planners and urban design professionals in North American cities. Development, planning, and environmental organizations such as the American Planning Association, the Urban Land

Institute, the Congress for New Urbanism, the Natural Defenses Resource Council, and the United States Green Building Council promote compact city and smart growth goals, including increased urban densities. This unanimity of emphasis on increasing density is striking in view of the history of urban planning. From the early to mid twentieth century, urban planners were quite intent on solving the *problem* of urban density rather than promoting it. It has only been in the last few decades that urban density has become regarded as something of a panacea for many social and environmental ills.

In fact, so closely has density become aligned with ecological sustainability that many urban designers consider compact neighborhood design to be a fundamental aspect of sustainable urbanism. Some purported benefits of density include more land for biodiversity and human access to nature (Hester 2006; Farr 2007). Density may also have indirect benefits. Calthorpe (2011) suggests a chain of personal, societal, and environmental benefits stemming from urban density, with dense environments leading to reduced auto use, which leads to reduced pollution and more walking, which lead to better health and stronger communities. While many of these benefits may be achieved with low densities, high density environments often offer economies of scale that allow market forces to align with economic and environmental objectives. Some success stories are available. For example, by using density to encourage transit use and walkable neighborhoods, Portland, Oregon has preserved farmland, increased housing options, and reduced per capita vehicle miles traveled (Calthorpe 2011). Other cities have used design standards in industry guidelines that include minimum residential and commercial density requirements, such as LEED for Neighborhood Development, to shape density policy.

While it is clear that density has many advocates, it is useful to consider what it is about density that they find so appealing. To do so, we will discuss the meaning of urban density and the advantages and disadvantages of increasing it.

How is density an issue for city planners?

Density is not new. While the modern professions of city planning and urban design are only a few generations old, density has been a part of urban structure since antiquity. The most current framework for conceptualizing urban density is the compact city movement (Randolph & Tice 2013). Therefore, it is useful to understand current issues of density through this lens.

Density is essential to the compact city. Compact cities are attempts to accommodate more people with less land and fewer resources. This does not necessarily involve a uniform increase in density everywhere. New Urbanist ideals call for concentrated density around transit nodes, but not high density generally (Churchman 1999). According to Ewing et al. (2015) compact development includes medium to high densities with "strong centers," mixed land uses, and contiguity with existing development. Compact city designs include dense, mixed-use development with an interconnected street network that facilitates mobility by transit, walking, and cycling (Lehmann 2016; Tian et al. 2015). While these features are primarily intended to leverage the resource efficiencies that high density affords, other motives relate to transportation and social interaction. Compact city principles call for urban growth boundaries and higher residential densities as a means to reduce auto use (Churchman 1999). Also, dense urban neighborhoods may offer greater opportunities to share knowledge through face-to-face interactions (Moroni 2016). While some of these ideas may appear novel in the context of modern North American development, Neuman (2005) reminds us that the term "compact city" is a redundancy that only has meaning when contrasted with the term "sprawl." Indeed, cities have traditionally been defined by, or at least characterized by, density, until personal, affordable automobility enabled the more dispersed settlement patterns known as suburbia. The compact city movement is less a celebration of urbanism than it is a rejection of suburbia, with the critical difference involving density. But, density itself has no intrinsic value. It is not a quality like 'happiness' or 'prosperity' whose inherent value increases with quantity. It is simply a result of certain market forces and policies that create, or are associated with, certain conditions. (Moroni 2016). Still, to understand its associated values, we should understand what urban density means.

Definitions of density

The dictionary definitions of the words "compact" and "dense" make their relationship unclear.[17] In general use, their meanings are similar (having or made of things that are close

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[17] The Concise Oxford English Dictionary defines "compact" as "adj. 1 closely and neatly packed together; dense.>having all the necessary components or features neatly fitted into a small space." and "dense" as "adj. 1 closely compacted in substance. >crowded closely together." Merriam Webster's Dictionary of Synonyms contrasts the words "compact" and "dense" this way: "**Dense** applies to something in which the arrangement of parts or units is exceedingly close....The term commonly implies impenetrability and an extended use may lose the basic notion of close packing of parts. **Compact** suggests close and firm union or consolidation of parts, especially within a small compass; it often also implies neat or effective arrangement."

together), with "compact" carrying an aura of neatness about it. However, each is a relative term and neither is particularly precise. This base ambiguity is compounded in the application of the term "density" to describe the ratio of human beings to land area. This ambiguity remains at all scales of measurement and has led to confusion and need for interpretation. There is no universally accepted measure for neighborhood density, making comparisons between studies difficult (Regoeczi 2003). Boyko & Cooper (2011) identify 23 working definitions of density and argue that density policy can be very complex. Such complexity may be lost, however, when descriptors of density as high, medium, or low, are used without specifying thresholds. Yet even with thresholds, whether arbitrary, contrived, or based upon some rationale, definitions of density may vary widely according to cultural, political, and geographical regions (Churchman 1999 p399).

Three common ways of discussing density as it affects people's life are as 1) a simple ratio of persons or dwelling units per area, 2) as perceived density (the range of subjective reactions to density), and 3) as crowding, a negative reaction to perceived density (Churchman 1999). Common measures of density include "Net Dwelling Density" (dwelling units per area of residential land), "Gross Residential Density" (persons, households, or dwelling units per residential area, including streets), "Neighborhood Density" (persons, households, or dwelling units per area of land used for residential or community purposes), and "City Density" (using city limits as the denominator) (Alexander 1993). Some factors involved in calculations of density include dwelling form, dwelling size, lot size, block configuration, measurements used and methods used to take the measurements (Alexander 1993). However, measures of density are often ill-defined because it may be unclear which area is included in the denominator (Churchman 1999). Even when the area is clear, the density measure may have little applicability due to variation within the area. For example, while densities within urban boundaries may be instructive, metropolitan area densities may be quite meaningless because they involve both urban areas and rural areas (Demographia 2017).

In addition to the complications of deciding how to structure the numerator and denominator of the urban density equation, the resulting ratio may have limited applicability for planning and policy purposes. This is because perceived density, people's experience of, and reaction to, density, is, ultimately, more important than net or gross measures of density, though it is far more difficult to measure (Hester 2006). Further, it is difficult to translate physical

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density into a measure of perceived density because the relationship between the two is weak (Alexander 1993, Rapoport 1975). Despite these complications, we can generally understand urban density to refer to the ratio of people per land area.

The ambiguity and lack of consensus or consistency in defining urban density create a challenge for those interested in measuring or discussing density. Even focusing on a discussion of high density, as this study does, is challenging. Dave (2011), in his study of neighborhood density and social sustainability, adopts the density thresholds of the Mumbai Metropolitan Authority for low (up to 200 units per hectare), medium (between 201 and 400 units per hectare), and high (between 401 and 600 units per hectare) densities, but these levels would likely have little currency in most other cities (Rapoport 1975). I have found no literature that attempts to define "high density" in either numeric terms or express characteristics in a North American context. While this may be an appropriate response, given that any definition would need to be tied to some geographic context and, even then, would likely be an arbitrary definition (Rapoport 1975), still, it shifts the burden of definition to every author who discusses the term.

Issues associated with low and high urban density

To understand the kinds of problems compact city designs are intended to address, we have to understand the kinds of problems suburban sprawl causes. Compact city goals can be understood in the context of addressing these problems, usually by containing sprawl, and may be focused on economic benefits, sustainability objectives, or social outcomes (McFarlane 2016). Economic benefits may include increasing opportunities for local retail merchants, concentrating a labor pool, increasing employment opportunities, providing efficient infrastructure, and providing affordable housing (Boyko & Cooper 2011). Higher density may promote sustainability by improving transit efficiency, facilitating walking and biking as mobility options, and reducing auto traffic congestion (Boyko & Cooper 2011). Other environmental benefits include reduced energy use (including options to use district energy systems), reduced auto use (for improved air quality), and preservation of farmland and open space (Churchman 1999; Calthorpe 2011). Compact city principles also include a social component. While early twentieth-century planning focused on reducing density, as cities were generally considered to be crowded, noisy, and dirty (Moroni 2016), compact city advocates believe higher density benefits outweigh such nuisances. Compact cities may increase opportunities for interpersonal interaction by favoring pedestrian mobility and providing public space (Bramley & Power 2009;

Talen 1999). A study by Freeman (2001) suggests a strong inverse relationship between automobile use and neighborhood social ties. According to Ewing (1997), "leapfrog" development fails to provide functional open space where authentic communal public life can occur. Other compact city social goals include increasing housing options, bringing vitality to neighborhoods, and improving safety (Churchman 1999; Boyko & Cooper 2011).

While these goals will likely appeal to many urban planners, by what mechanisms can density achieve them? Generally, the tools planners have include policies and pricing mechanisms. Pricing mechanisms, especially those with a clear nexus (such as increased infrastructure costs) could, in theory, curb sprawl, but many, such as congestion pricing, are politically difficult to enact (Ewing et al. 2015). Policies may include zoning regulations and growth boundaries. Zoning regulations may allow for denser development but may not be able to sufficiently incentivize it if market conditions are inhospitable. Growth boundaries may be effective at setting physical limits to sprawl, but have not been widely used and so have had few success stories. A study by Anthony (2004) showed that state growth management programs were not effective at limiting sprawl, but a study by Carruthers (2002) suggested that state growth management programs with consistency requirements and enforcement mechanisms might be (Ewing et al. 2015). Portland, Oregon has enacted urban growth boundaries in an effort to contain sprawl and seems to have enjoyed some success (Song & Knaap 2004). However, in order to accept that compact city principles can mitigate the problems associated with sprawl, one has to accept a series of premises. These premises include, in order, that problems exist, that they are caused by sprawl, that aspects of compact city design (including density) can address these problems, and that policy mechanisms can bring about these design solutions. These premises must be both technically viable and theoretically defensible. Are they?

Compact city claims have several vulnerabilities. They may be invalid because they are technically infeasible, politically infeasible, over-stated (good, but not as good as claimed), mis-matched (good, but for other problems), misguided (misaligned with the problems they are intended to address), or conceptually flawed. Many of these contestations are considered elsewhere, but this review will only consider the conceptual soundness of compact city claims. While compact cities may offer economic efficiencies of scale and infrastructure and increased access to goods and labor, economic disadvantages are also noteworthy and may include higher construction costs, higher costs of goods and services, and higher costs of housing (Boyko &

Cooper 2011). Density is often touted for its ecological superiority, but environmental disadvantages may include loss of urban open space, higher ecological construction costs, and higher pollution due to traffic congestion (Churchman 1999). If we consider extreme examples of density, we see that they are not sustainable by many metrics. For example, Kowloon Walled City in China, with a population density of 1.2 million people per square kilometer (until it was demolished in 1992), was an example of a neighborhood with an unhealthy, unsafe, and unsustainable level of density (Lehmann 2016). While compact cities may offer more opportunities for social encounters, social disadvantages may include increased anxiety, reduced privacy, reduced safety, reduced environmental control, increased competition for resources, increased social segregation, loss of recreational opportunities, difficulty supervising children playing outside, and loss of sense of community (Churchman 1999; Boyko & Cooper 2011; Bramley & Power 2009). Transportation disadvantages may include increased pedestrian and vehicular congestion and a lack of parking (Boyko & Cooper 2011). Even today, many people associate the word "urban" with crime, congestion, poverty, and crowding (Calthorpe 2011). Suburban living still appeals to Americans for several emotional reasons, including feelings of independence, success, privacy, safety, familiarity, luxury, and ownership (Hester 2006). For many such reasons, it would be a mistake to assume that resistance to compact city principles is unfounded (Moroni 2016). After all, it was not that long ago that planners' prime directive was to alleviate the problems of urban density. Density has gone from a perceived environmental and social liability to a perceived asset in only about a generation (Tonkiss 2013, p37).

Density and high-rise development

When we consider urban density, it is important to distinguish between area density and building density. Although people may intuitively associate high-rise development with high density, this association is by no means fixed (Churchman 1999). As Lehmann (2016) makes clear, building density and area density are not necessarily associated, as a given area density may be achieved, theoretically, by different housing typologies. But, in practice, high-rise buildings are only financially viable when land costs and housing demand are high, and this combination is usually limited to downtown cores. While different building typologies can, in theory, produce equal area densities, they tend to occur within particular density ranges. Alexander (1993) compares the density ranges of residential buildings by typology (single family detached, row housing, low-rise garden apartments, and high-rise apartments). He finds that

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single family housing tends to range up to 10 units per acre, row housing and garden apartments tend to range from 20-40 units per acre, and high-rise apartments tend to range from 60-170 units per acre. This provides some rationale for tying density to building typology. However, functional differences in density may not be reducible to simple ratios of only one numerator and one denominator. To provide meaningful comparisons between areas, it may be that several density measures should be considered. Dovey & Pafka (2014) argue that urban densities can only be meaningfully compared when they consider a suite of metrics that include building typology, building density, population density, and open space. They refer to these compilations as 'density assemblages.' A genuine understanding of urban density would likely take some such suite of measures into consideration.

As noted by Alexander (1993) (and, as seems intuitive), high-rise development is most likely to produce the highest building densities, and, by extension, the highest neighborhood densities. This suggests that literature on the experience of living in high-rise structures would be very helpful in a discussion of urban density. Unfortunately, as several authors note, there seem to be few recent articles that discuss the socio-cultural aspects of the high-rise building typology in the North American context (Nethercote & Horne 2016, Harris 2015, Graham & Hewitt 2012)). This lack is particularly notable when searching for the experience of particular demographics, such as families with children living in high-rise environments (Whitzman & Mizrachi 2012). While a large body of literature from the United States in the 1970's focussed on issues of social degradation and crowding associated with inner-city high-rise social housing, more recent literature seems to coalesce around theories of "vertical urbanism," such as by Nethercote & Horne (2016), Harris (2015), Graham & Hewitt (2012), and Harker (2014) (who all seem inspired by the work of Eyal Weizman on power and space in the West Bank in Israel (Harker 2014)), or on more pragmatic issues related to high-rise living in highly-dense Asian cities, such as reported by Randolph & Tice (2013), Karsten (2015), Yeh & Yuen (in Yuen & Yen 2011), and Cho & Lee (2011).

The character of residential high-rise (or, "tall") buildings, as discussed in the literature, allows for some variation. For example, high-rise buildings may contain several uses, but traditionally these uses are only mixed at the ground level; most floors in a high-rise building are mono-functional (Dovey & Pafka 2014). In many locations, residential high-rise buildings are traditionally constructed for the rental market, but not all high-rise residents are renters.

Condominium buildings, usually high-rise, have a financial structure that allows residents to own their units. In many cities, this arrangement is very popular. For example condominium units in Toronto increased from about 65,000 in 1981 to around 280,000 in 2011 (Rosen & Walks 2014). Also, the height of a high-rise, or "tall" building, is open to interpretation. Nematollahi et al. (2016), in their study of residents' attitudes toward density in Perth, defined high-density housing as apartments over four stories tall. Verhaeghe et al. (2016) also use this definition. But, according to the Council of Tall Buildings and Urban Habitat, "tall" buildings are ten stories or more (Yeh & Yuen in Yuen & Yen 2011). Nethercote & Horne (2016), in their case-study investigation of high-rise residents in Melbourne, consider high-rise buildings to be 15 stories or more. Perhaps the height threshold of a high-rise building varies by region. It is difficult to know from the academic literature if this is so, but it critical to the discussion.

In the last few years, there seems to be a growing body of theory around the relationship between high-rise buildings and social forces, generally in the field of human geography. Baxter (2017) discusses the origins of high-rise architecture springing from the International Style (popularized by architects such as Le Corbusier and Walter Gropius). He notes that most literature discussing high-rise issues is concerned with the social failure associated with high-rise living (such as Pruitt-Igoe), but he also points to an emerging dialog around vertical urbanism that seeks to understand issues of vertical living that range from power dynamics to 'ordinary topologies.' Graham & Hewitt (2012) discuss the relationship between building height and power and money. They point out that in many cities, such as Dubai and Hong Kong, elevation (especially with fast elevators) is a symbol and mechanism of elitism, as wealthy high-rise residents are able to vertically separate themselves from the masses (see also Harker 2014 and Harris 2015).

Some researchers have sought to discuss the particular characteristics of high-rise living. Boyko & Cooper (2011, referencing Mitchell 1971 and Bagley 1974) claim that residents of high-density dwellings are more likely to suffer from emotional illness, hostility, and neuroticism. Kitchen et al. (2012), using Statistics Canada data from 2008, found sense of community belonging to be lowest among residents of high-rise apartments. Karacor & Parlar (2017) suggest that an increase in high-rise buildings in a neighborhood in Istanbul has resulted in a reduction in use of public space and thereby a reduction in collective efficacy and place attachment. Other researchers are more nuanced in their conclusions. Van Soomeren et al.

(2016), in their study of crime in two neighborhoods with high-rise buildings (one in Amsterdam and one in Barcelona) suggest that the high-rise buildings were less related to crime than was the low-density environments in which they were placed, as this low density led to deserted public spaces, fear of crime, and criminal acts. And Verhaeghe et al. (2016), using data from the 2001 Belgian Census, found that residents in high-rise buildings tended to report having poorer health, but these findings could mostly be accounted for due to socioeconomic and demographic variables (meaning they found no negative health effects associated with high-rise living).

Few recommendations seem to be available in academic literature for architects seeking to improve the lot of high-rise dwellers, but the City of Vancouver (1992, p7, 8) has provided a set of guidelines for the construction of high-density (including high-rise) housing for families. Some suggestions include the following:

- Provide direct visual and physical access between each unit and at least one common play area (3.4.3)
- Strictly segregate children's play and circulation areas from vehicle traffic (3.5.3)
- Design interior corridors to accommodate children's play and toys (3.6.3)
- Provide indoor amenity spaces for play and large gatherings (3.7.2)

Such strategies, while directed at family housing, may prove beneficial for any high-rise development. On the other hand, it may be that such concerns are much ado about nothing, or that they can be resolved monetarily. Economist Edward Glaeser is quite sanguine about high-rise development, arguing that "limiting high-rise development...guarantees high prices" (2011, p152). He claims that "canyons of glass and steel and concrete, such as those along New York's Fifth Avenue, aren't an urban problem; they are a perfectly reasonable way to fit a large amount of people and commerce on a small amount of land. Only poor policy prevents a long row of fifty-story buildings from lining Mumbai's seafront....height is the best way to keep prices affordable and living standards high." (p160). Glaeser suggests replacing poor policies, such as those preventing new construction from blocking light and views, with a fast-track tax system that financially compensates "neighbors who lose light from a new construction project" (p161).

While high-rise living has developed a somewhat negative reputation in many Western lands, in Asian cities, such as Hong Kong and Singapore, the common perception is a bit different. The literature on high-rise living favors consideration of Asian cities and dates back

several decades. Mitchell (1971), in his study of high-rise residents in Hong Kong in 1967, produced several findings, including the following:

- Density within dwelling units had limited effects on occupants

- Attitudes toward lack of privacy corresponded with densities within dwelling units

- High densities affected worry and unhappiness, but only for the poorest residents

- Densities alone did not affect intense emotional strain and hostility

- The condition of non-related families sharing a unit caused them stress

- Parents living in high-density housing had limited control over children playing outside

- High-density housing discouraged interaction among neighbors

Other researchers have focussed more on the social aspects of high-rise living in Asian cities. While Dave (2011), studying neighborhoods in Mumbai, found no connection between household density and social interaction, he did find that building form influenced behavior. He found that there was less informal chatting among neighbors who lived in high-rise buildings. This may have been due to a lack of community space. In their study of high-rise residents in Seoul, Cho & Lee (2011) suggest that provision of community spaces and community programs will improve resident satisfaction. Some cities seem to be taking such suggestions to heart. Yuen (in Yuen & Yeh 2011, p136) notes that Singapore is not content to provide minimally acceptable public high-rise housing, but rather "a total living environment" that would support "quality living, recreation and accessibility to facilities and a sense of community spirit and belonging."

Researchers have given special attention to issues of family life in high-rise environments in Asian cities. Rapoport (1975) notes that, in Chinese culture, upper stories of high-rise buildings are far less desirable than lower stories for residents with children. Whitzman & Mizrachi (2012) studied how children living in high-rise buildings in Melbourne used public space as part of their Vertical Living Kids research project. They found that children who lived in public housing tended to have a high level of freedom and a low quality of public space (a 'wasteland' condition) but children in private housing tended to have a low level of freedom and a high quality public space (a 'glasshouse' condition). Randolph & Tice (2013) studied the demographic data of high-rise occupants in Melbourne and Sydney and found that they are primarily childless renters. They suggest that if planners wish to use high-rise development as a means to produce compact city environments, they should structure these developments so that

they will accommodate a wider range of lifestyles. A study by Karsten (2015) of middle-class families with children living in high-rise apartments in Hong Kong found that few interviewees interacted often with their neighbors and most felt that the environment provided poor opportunities for their children to play. On the other hand, considering the culture and lack of housing alternatives, interviewees felt that, overall, high-rise living was compatible with raising children. As Karsten notes, this viewpoint tends to contradict most other findings.

What are the effects of increasing density?

Researchers have considered density's relationship with a variety of economic, ecological, and social issues. For example, researchers have recognized the role of density in facilitating agglomeration economies (Boyko & Cooper 2011). Such agglomeration economies lead to an increase in job opportunities within the sector and in supporting sectors (Tonkiss 2013, p39). This, in turn, may increase the desirability of an area for employment, and, in turn, its marketability as a residential area. Yet, some studies have shown cases of a low market demand for high-density neighborhoods (Tian et al. 2015; Bramley & Power 2009). Other studies have shown that residents in high-density areas are often dissatisfied with their neighborhoods, especially in low-income neighborhoods (where residents may have no good options for moving) (Baldassare 1982). Studies associate increased density with reduced automobile and energy use (Hall 1999), but also with decreased affordability (Boyko & Cooper 2011). City planners often seek to enhance a city's marketability, sustainability, and livability, and may look to density to address all of these goals, yet these goals may be poorly compatible. For example, with respect to energy use, there may be conflicts among the goals of livability (high energy use), sustainability (low energy use), and marketability and affordability (low energy cost), that density cannot resolve. One of the paradoxes of the compact city is that sustainability and livability may be inversely related (Neuman 2005, Howley et al. 2009, Bay & Lehmann 2017). Other relationships among density-affected variables may be similarly complicated.

How density affects marketability

It is difficult to know how density affects marketability in a given market, since people's preferences differ. If the question of marketability reduces to maximization of cash value of land, density may offer so much monetary advantage in number of units to sell that any disadvantages may be completely offset. Still, it is useful to consider what advantages and disadvantages dense environments offer on a per-unit basis. One marketing advantage is

proximity to employment centers, especially when these tie in to agglomeration economies that may offer robust employment options (Boyko & Cooper 2011, Glaeser 2012). The question is how appealing this proximity is in comparison to other quality of life factors. Several surveys show American preferences both for the high-density advantages of walkable environments with close amenities and short work commutes as well as for the low-density advantages of privacy, space, and free parking (Tian, et al. 2015). Privacy in general, and private outdoor space in particular, is of paramount importance in some cultures (Mulholland Research & Consulting 2003). While compact city and smart growth environments are advocated by many environmentalists, planners, and urbanists, most renters and home buyers in North America have not shown a high demand for them (Tian et al. 2015). In a study of English housing, Bramley & Power (2009) found an inverse relationship between density and neighborhood satisfaction across all demographics they sampled. A survey conducted in Salt Lake City, Utah showed that the highest priority of respondents, when considering where to live, was convenient parking (Tian et al. 2015). However, a balance of several preferences is at play in the marketability, and financial viability, of dense developments. Whatever people's affinity for, or aversion to, density *per se*, the North American market has shown that some popular areas, such as downtown San Francisco or midtown Manhattan, continue to maintain high prices for housing irrespective of the densities involved. In the last few decades, the density of Vancouver, B.C. has more than doubled and so has the cost of living in condominiums in the densest parts of the city (City of Vancouver as cited in Montgomery 2013). This is not to suggest that the market is willing to pay more for housing *because of* high density (more likely it is *despite* the density), but simply that, in some areas, density and marketability can rise in tandem. Density may also carry a substantial cultural connection which may be positive or negative. For example, in Singapore, today one of the densest cities in the world, residents, who had traditionally lived in low-density villages, had to become accustomed to the high-rise building typology, which they initially viewed as foreign (Lawson in Ng 2009).

How density affects sustainability

In its EcoDensity charter (City of Vancouver 2008), the City of Vancouver claims that "A denser city uses less energy, provides easier access, promotes public health, and is more affordable than a less dense city." Several North American cities have made similar claims. While a commonly-cited motive for increasing density is to improve ecological sustainability,

there remains a paucity of empirical evidence that the compact city is actually more sustainable than its alternates. Some sectors, such as transportation, offer compelling rationales. The relationship between the built environment and travel demand, according to Ewing et al. (2015), has become the most researched subject in planning literature, with empirical studies being in general agreement that a strong relationship exists. Studies show a positive correlation between density and walking and a negative correlation between density and vehicle miles traveled (VMT), although effect sizes vary greatly. Some studies have shown higher-density cities reduce automobile and energy use, but non-linearly and with decreasing benefits (Hall 1999). Other studies have shown relationships between density and biodiversity (negative), concentration of pollutants (positive), and per capita energy use (negative) (Boyko & Cooper 2011). Buildings in dense environments may have lower energy needs due to the insulative benefits of shared walls, but differences in energy savings in high-density buildings as compared to low-density buildings may be less significant today than in past decades due to overall improved building techniques (Holden & Norland 2005). Phinyawatana (in Schropfer 2016) cites several strategies for enhancing the sustainability of high-density buildings, but all of the strategies Phinyawatana cites would be equally valid for low-density buildings. Public health can be considered an issue of sustainability. Ewing et al. (2015) found that health problems, such as obesity, heart disease, high blood pressure, and diabetes are less common in compact environments than in low density environments. However, given the varied findings in recent literature, it may be argued that compact city principles are neither necessary nor sufficient to achieve urban sustainability (Neuman 2005).

How density affects livability

Of special interest to this study is the affect of density on quality of life. Studies have associated density with several aspects of quality of life (Macdonald 2007), perception of environment, and social issues. In what the authors consider to be the first study of the effects of density upon quality of life, Cramer et al. (2004) found that quality of life varied inversely with density, even when controlling for factors such as levels of education and income. Mouratidis (2018), though, found the opposite relationship, as did Bardhan et al. (2015). Psychological effects of living in high-density environments may include decreased perception of privacy and increased anxiety (Raman 2010) as well as loneliness and lack of control (Evans 2003). Several studies have shown the deleterious effects of high-density, high-rise, multi-family housing

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environments on families with young children, especially when compounded by the effects of poverty, restricted play opportunities, and lack of public socializing spaces (Evans 2003, Krysiak 2018, City of Toronto 2017). Studies have shown a negative relationship between density and mental, emotional, and physical health (Boyko & Cooper 2011) though some health agencies claim the opposite (BC Centre for Disease Control 2018). Burton (2000) found that higher density areas tended to be associated with less domestic living space, less affordable housing, higher crime levels, and lower levels of walking and cycling, but higher transit use, less social segregation, and better access to facilities, than lower density areas. Bolleter (2020) claims that adding greenspace to dense environments can relieve many of the psychological stresses common to density.

In addition to studies of density, studies have considered perceptions of density. Perceptions of density vary greatly from person to person and may have little relationship to objective measures of density (Raman 2010). A study in New Zealand by Walton et al. (2008) that measured perceived neighborhood quality (to represent residential satisfaction as a component of quality of life) found that their respondents preferred medium-density neighborhoods, but were split as to their lesser preference for low- and high-density neighborhoods. They concluded that resident density preference was based upon trade-offs rather than being linearly associated with density. A national sample of households showed a negative association between density and community satisfaction (Audirac 1999) and a study by Baldassare (1982) suggested that low-income residents in high-density areas showed the most dissatisfaction among the groups sampled.

Social effects of density are particularly noteworthy in view of claims that compact cities may positively influence communal interactions. Some studies suggest that residents in high-density neighborhoods form fewer but stronger bonds with neighbors (Boyko & Cooper 2011). Raman (2010), in a study of six UK neighborhoods, found that social interactions in outdoor public spaces were most frequent in medium density areas (80-100 households/hectare) and least frequent at the lowest and highest densities. Studies have suggested that communal spaces are critical for neighborhood social activities, especially in denser neighborhoods (Raman 2010), yet requirements for community and social spaces may hamper efforts to create very high densities while maintaining a highly livable environment (Hall 1999). A study by Nguyen (2010) found that living in a high density area is associated with low social interaction and volunteering, but

higher political participation. A study by Morris and Pfeiffer (2017) found no meaningful difference between the amount of time spent socializing by urbanites versus suburbanites. And, studies have shown a negative correlation between density and affordability (Boyko & Cooper 2011), though each may be a product of confounding factors, such as job availability. The effects on livability are thus varied and it is difficult to know whether they are, on balance, more positive than negative.

A fundamental livability issue related to high density environments is crowding. Researchers agree that spatial restriction is a prerequisite for crowding, but lack agreement regarding the degree to which it is primarily a physical manifestation or primarily a psychological response. Stokols (1972a, p276) frames crowding as a spatial issue, characterized as a "motivational state directed toward the alleviation of perceived restriction and infringement, through the augmentation of one's supply of space, or the adjustment of social and personal variables, so as to minimize the inconveniences imposed by spatial limitation." Elsewhere, however, Stokols defines crowding as a "multivariate phenomenon, resulting from the interaction of spatial, social, and personal factors, and characterized by the adverse manifestations of stress" (Stokols 1972b, p75). He also distinguishes between non-social crowding (a person not having enough physical space for some task) and social crowding (unwanted social contact—the primary type of crowding discussed in the related literature) (Stokols 1972b). Yust (2012) defines crowding in a numerical, non-psychological way, as "the relationship between the amount of space in a housing unit to the number of individuals in the household," and considers a dwelling unit to be "crowded" at one person per habitable room (which excludes bathrooms and storage rooms), "severely crowded" at 1.5 persons per habitable room, and overcrowded at two persons per habitable room (see also Lauster & Tester 2010). Evans (2000), on the other hand, defines crowding as "an adverse psychological response that occurs when the need for space exceeds the current supply." Standards of crowding in one cultural context may be far different from acceptable standards in another cultural context (Lauster & Tester 2010), although Evans (2000) claims no scientific evidence exists on this point.

How does urban density influence sense of community?

In our investigation of density's effect upon sense of community, we should first consider the breadth of influences upon sense of community. While it is impossible to do this completely, I will show the major themes that I have found in the literature. Halamová (2016) categorizes three approaches to building sense of community, which she calls "accidental" (due to crisis (which she doesn't recommend as a strategy)), "unintentional" (by putting people with similar interests or characteristics into close proximity), and "deliberate" (which involves purposive activities or other interventions). She argues that these approaches may be aimed at individuals, groups, or the physical environment (Halamová 2016). Jabareen & Zilberman (2017) propose a different evaluative framework of sense of community that includes three categories of factors, namely, physical typologies (objective and subjective measures of the built environment), demography and socioeconomics, and cultural perceptions (of, for example, trust). Jung et al. (2015) frame these categories as physical environment characteristics, socio-demographic characteristics, and social interaction characteristics. Kim (2007) groups sense of community influences into four domains, namely, community attachment, social interaction, community identity, and pedestrianism. A commonality among these frameworks is a consideration of how the physical and cultural environments influence how people perceive their communities.

Studies have considered several influences on sense of community, including architectural design (Molana & Adams 2019), migration intentions (Wolfe et al. 2020), leisure time physical activity (Ross & Searle 2019), events (Zhao & Wise 2019), happiness (Ross et al. 2019), economic opportunity (Lardier et al. 2019), loneliness (Itzhaki & Cnaan 2019), diversity (Mannarini et al. 2017), values (Mannarini et al. 2019), walking (Wood et al. 2010), and dog-walking (Toohey et al. 2013). Researchers have found correlations between sense of community and several demographic elements, such as age, length of time in community, number of children, and education, but often separate findings contradict each other (Sense of community Partners 2004). A study by Glynn (1981, noted by McMillan & Chavis (1986)) found that length of time residents expected to live in a community, how satisfied they were with the community, and how many of their neighbors they knew by name were the strongest predictors of the residents' sense of community (see also Cochrun 1994). In a multi-level analysis of several neighborhoods in New York City, Long & Perkins (2007) found length of residence,

participation, neighboring, empowerment, communitarianism, place attachment, block satisfaction, and block confidence to all predict sense of community, with place attachment being the strongest predictor. A study by Wilson & Baldassare (1996) showed positive relationships between sense of community and percentage Anglo, localism (residents' relative interest in local issues), privacy (ability to control one's separation from others), income, and age. A study by Kingston et al. (1999) found positive relationships between sense of community and both income and education. In contrast to Wilson & Baldassare and Kingston et al., Long & Perkins (2007) found positive relationships between sense of community and both affluence and non-white ethnicity, but no relationship with education. Sense of community is strongly related to participation in neighborhood associations, though it is difficult to know how to assign causality (Unger & Wandersman 1985). Similarly, sense of community has been linked to social control of the neighborhood and public ownership of neighborhood facilities (Talen 1999). Given the negative effect of heterogeneity, successful development of sense of community is more likely when members acknowledge and accept cultural differences rather than ignore or seek to suppress differences (Halamová 2016). While establishing common ground is an essential aspect of sense of community, such commonality must include recognition of, and respect for, differences among members in order to be genuine (Putnam 2003).

Many factors may inhibit sense of community. Putman (2000) provides a detailed and compelling description of the decline of civic engagement in America over several decades and provides some speculation as to the reasons for this, including increased financial pressures, sprawl, and television watching, but fails to find any compelling evidence of correlation with any of these factors, or with any others. Wilson & Baldassare (1996) found negative relationships between sense of community and city size, city density, and home ownership. Other studies have found affluence and increased social status to be at odds with neighborhood attachment (Talen 1999). This may be due to a positive correlation between affluence and expectations of privacy. Privacy is an important complicating variable. The relationship between privacy and sense of community appears to be non-linear. Too much privacy reduces opportunities to develop one's sense of community (which may be desirable to the individual) and too little privacy leads to withdrawal from social contact (Wilson & Baldassare 1996). However, withdrawal (or reluctance to engage) may also occur when privacy is not threatened.

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In one neighborhood studied by Merry (1987), residents avoided interaction with neighbors, not out of hostility, but because they were "preoccupied with status, completion, individual growth and fulfillment, and constant activity." Residents met their needs for community interaction elsewhere and considered taking time for informal neighborhood chat to be a sign of lower status and importance. In less affluent settings, safety, rather than privacy, may be a prime consideration. Lack of trust, fear of crime, and struggle for resources all make sense of community in a neighborhood difficult (Jabareen & Zilberman 2017). Demographic diversity has also been shown to hinder sense of community (Neal & Neal 2014). Cultural, ethnic, and other demographic differences can prove challenging to persons seeking to build a sense of community, leading to feelings of distress, distrust, and alienation (Halamová 2016). Ethnically homogeneous sections of a neighborhood may resist integration into the larger neighborhood as defined by spatial boundaries (Unger & Wandersman 1985). Competing communities, such as virtual environments, may reduce sense of community in other, more traditional communities, such as neighborhoods. Farahani (2016) describes a 'virtual sense of community' as "members' feelings of membership, identity, belonging and attachment to a group that interacts primarily through electronic communication," and argues that such online interaction may enhance or detract from neighborhood sense of community, but cannot exactly replace it.

Researchers have claimed several associations between the built environment and sense of community. Moustafa (2009 p81-84) distinguishes between the *instrumental* role of the built environment in affecting sense of community ("the capacity of physical characteristics of the environment to enable or promote the occurrence of behavior"), in which the built environment operates as a tool that provides affordances for interaction, and the corresponding *symbolic* role ("the capacity of physical characteristics of the environment to affect perceptions about the social environment"), such as signs of neighborhood beautification or degeneration that affect residents' pride of place or fear of lingering. Common approaches to influencing sense of community with the built environment typically involve facilitating informal social contact with the thoughtful placement and design of common public areas (Halamová 2016). How this can best be accomplished is the subject of many urban design books. Hester (2006) suggests that good public centers should concentrate multiple uses and provide opportunities for both routine activities (such as shopping) and special rituals (such as community events). Cochrun (1994), on the other hand, warns that when public institutions from several neighborhoods are concentrated

in one area, this may reduce opportunities for local interaction by putting the venues too far away. A study by Kingston et al. (1999) found associations between sense of community and the presence of recreational spaces, the presence of a town grocery, and the absence of auto traffic, but found no association with the presence of neighborhood-bounding arterial roads.

The concept of "New Urbanism" has, for the last few decades, been central to ideas linking the built environment, and, especially the public realm, to sense of community (Hooper et al. 2020). Enhancing sense of community with the built environment is fundamental to New Urbanism. Strategies include the thoughtful integration of private and public space, clear neighborhood boundaries, pedestrian and Transit Oriented Development, and mixed land use (Talen 2000). Some communities have been built according to New Urbanist principles and researchers have evaluated some to test the claimed links with sense of community. Kim (2007) studied ten physical features of Kentlands, a New Urbanist development in Maryland, U.S.A., and found that the mixed-use nature of the development and the proximity of the local shopping center were the most significant built-environment contributors to sense of community. A study by Lund (2003) of several New Urbanist neighborhoods in Portland, Oregon found that amenities such as parks and retail shops tended to increase pedestrian travel and that people who walk in their neighborhoods were more likely to develop relationships with their neighbors. Other studies have found associations between pedestrian-friendly environments and sense of community, but the results vary depending upon whether residents are walking for leisure or for transportation (French et al. 2014). Anecdotal success stories are available, such as that of one Vancouver resident who found that by moving from a higher-level apartment to a ground-level apartment within the same building (a more New Urbanist environment), he went from having no social contact with his neighbors to knowing several of them and having an active social life (Montgomery 2013).

Both within the New Urbanist movement and without, advocates of social cohesion point to the social benefits of open space. However, there are not many studies that directly relate open space to sense of community, and fewer that account for the design and quality of the open space under consideration or the frequency of its use (Francis et al. 2012). However, a few studies are instructive. A study by Kazmierczak (2013) showed that visitors to well-maintained local parks tended to have more extensive social ties within their neighborhoods. A study by Francis et al. (2012) compared six open space types (parks, plazas, sidewalks, shopping malls,

community centers, and schoolyards) according to ten attributes (walking paths, shade, water features, irrigated lawn, birdlife, lighting, sporting facilities, playgrounds, type of surrounding roads, and presence of nearby water) in 1,900 open space locations in Perth, Australia and found a high correlation between sense of community and what residents considered to be high-quality open space. Farahani & Lozanovska (2014) also suggests that social life in public spaces may be enhanced through improved activity-generating spaces (such as parks and plazas), planning strategies (such as incentivizing higher density and mixed land use), and design strategies (such as landscaping and outdoor seating). While high-quality open space tends to be more useful than low-quality space, a study by Cattell et al. (2008) in the 'most ethnically diverse borough in Britain' suggested that even mundane public spaces can act as important venues for building tolerance for neighborhood diversity. Still, we must remember the limitations of our ability to assign causality. For example, a study of two edge city communities by Schwaller (2012) found a positive relationship between the resident use of public space and resident sense of community, though there was little evidence that this sense of community is built either en route (walking) to the public space locations or by interacting at these particular locations. And, a study by Francis et al. (2012) found that, of the many possible uses people might have for open space, relaxation was the only use that corresponded to sense of community. Jacobs (2011) observed that city parks are often unsafe and unused except for crime or other unsavory endeavors. So, while public open space may correlate with sense of community in many studies, there is little basis to assume that any public space anywhere at any time will have similar effects.

A significant limiting factor in the relationship between public space and sense of community is the issue of privacy. Privacy features as a mitigating factor in several studies of sense of community. A study of community-oriented housing in Finland by Helamaa (2013) showed that key features important to residents who sought out such housing included purpose-built spaces for both formal and informal encounters and the ability to control residents' level of privacy. In seeming fulfillment of Lewis Mumford's description of suburbia as "a collective effort to lead a private life," typical suburban shopping malls provide an environment in which its denizens experience 'the presence of others, but not their company' (Putman 2000). A challenge of designing the built environment to facilitate interaction is that the built environment, by its nature, tends to be inflexible. A case study of a co-housing community in Atlanta, Georgia, in which the physical layout was designed for, and the community members were self-

selected for, optimal communal existence, found that the narrow sidewalks created conditions of both wanted *and* unwanted social contact (Brower 2011). Ideally, the built environment should provide residents with the ability to limit their contact with their neighbors without having to retreat entirely (Gehl & Birgitte 2013). A 1973 study of dormitory students by Andrew Baum showed that those who had a semi-private buffer zone between their (private) room and the (public) corridor were far less anxious and more sociable than those who had to transition directly from their rooms to the corridor space (Baum et al. in Aiello & Baum 1979). And, a study of Danish residents by Jan Gehl found that residents were most likely to chat with their neighbors when front porches were close enough to walkways to facilitate conversation but far enough away that conversation could easily be avoided (Gehl & Birgitte 2013).

There may also be built environment challenges to sense of community. While some retail locations, such as pubs and cafes, may increase local social contact by providing opportunities for casual interaction among residents of a neighborhood, other retail locations, such as grocery stores or clothing stores, may decrease local social contact by filling the local sidewalks with transient, non-local shoppers (Baum et al. 1978). A study of three parallel residential streets in San Francisco, California by Donald Appleyard showed a strong negative correlation between the amount of vehicular traffic and the vitality of social life and sense of community of residents on these streets (Gehl & Birgitte 2013). Negative visual cues, such as litter, unkempt yards, and persons loitering, may lead residents to associate a neighborhood with crime and then avoid developing a (positive) sense of community in that area (Unger & Wandersman 1985). This wariness might be mitigated by physical and visual boundary markers that define outdoor private and semi-private space, thereby creating "defensible space" that can help preserve perceptions of safety, privacy, and environmental control (Unger & Wandersman 1985). Based upon their study of sense of community in Beer Sheva, Israel, Jabareen & Zilberman (2017) recommend planners seeking to improve sense of community should seek to improve neighborhood aesthetics, transportation, and accessibility, and should strive to create more compact neighborhoods. Another challenge to neighborhood sociability may simply be time. Jacobs (2011 p73) notes that "the trust of a city street is formed over time from many, many little public sidewalk contacts." She suggests that residents in a new neighborhood may need months or even years of head nods and other small acknowledgements before they begin to commit to engaging conversations.

Having considered a breadth of other potential influences upon sense of community, including influences related to the built environment, let us now turn our attention to what influence density might have. Jabareen & Zilberman (2017) note that physical typologies can involve either objective elements (such as street networks, compactness, density, land-use types and mixes, transportation systems, connectivity, and aesthetic elements) or subjective elements (people's perceptions of the objective ones). While we can benefit from studies that consider the objective measure of density, it would be even more useful to consider studies that compare residents' perception of density (such as crowding) to their sense of community. Unfortunately, this seems to be a gap in research. Some studies do comment on some aspects of density as related to sense of community. Jung et al. (2015) compared residents' sense of community in a pedestrian-oriented neighborhood versus an auto-oriented environment in Seoul, Korea and found negligible difference. Wilson & Baldassare (1996) found a statistically significant negative relationship between density and sense of community, but their finding was limited in that it was restricted to a low-density area and relied upon a single question to describe the dependent variable[18]. French et al. (2014) found a negative relationship between density and sense of community, but this was also in a low-density environment (Mean = 6.36 dwellings/acre, Standard Deviation = 3.02) and their results were statistically insignificant (p-value = 0.08). Baum et al. (in Aiello & Baum 1979) report their findings related to a high-density environment and claim that the nature of the circulation in most high-rise buildings is antithetical to meaningful neighbor contact and prevents the development of sense of community, but their study was very limited in scope and demography, making generalization tenuous. While several studies have related density to behavioral responses, and several others have related built environment factors to sense of community, I have found no studies that attempt to relate high-density residential environments, or perceptions of density, to sense of community. This leaves the relationship unresolved in the current literature.

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[18] "The dependent variable, which is the respondent's overall sense of community, is derived from a question: 'In general, would you describe your city or community as one which has a sense of community, or not?' About 68% perceived that their city or community had a sense of community; 32% said that it did not." (Wilson & Baldassare 1996 p34)

The role of public space

A special focus of this study is the provision and nature of public space in high-density environments. Measurement of such spaces requires an informed understanding of their distinct nature. A premise of the study was that high-density neighborhoods and buildings would experience a lack of quality public space, which would create a lack of informal social interaction and, thereby, a reduction in residents' sense of neighborhood community. I expected this condition to be especially notable in high-rise buildings. The literature tends to support this expectation.

Several researchers have noted the lack of public space associated with high-rise developments. For example, Kim (2014) notes that in South Korea, public spaces and amenities are typically afterthoughts, shoe-horned into undeveloped sections of a lot. Shim et al. (2004), on the other hand, suggest that these spaces are moving from ground level to higher levels in mixed-use high-rises in the form of deck spaces and rooftop gardens. Still, they argue that these elevated public spaces suffer from a lack of integration with the surrounding urban fabric. Holahan (1976) found that a fundamental discontent of residents of a North American ghetto neighborhood who moved into a high-rise environment was the lack of semi-public space, and the resultant lack of opportunities for informal social exchange. Zaff & Devlin (1998), in their investigation of elderly residents in Connecticut housing developments, found that those living in garden apartments had a higher sense of community than those living in high-rise buildings, and theorize that this is due to differences in the amount of both defensible space and semi-public space for informal socializing. Other researchers have had similar findings and certainly none have associated high-rise development with *excessive* public space.

Some municipal authorities have responded to the lack of public space in high-density development with legislation or suggested practices. In response to the poor quality of public space provided by market development in the 1960's and 1970's, the Singaporean government instituted a "New Town Structural Model" based on the precinct unit. Each precinct would include a center which had a playground, garden, or other amenity. The precinct public spaces were intended to promote social interaction and community awareness (Hee 2017). North American cities have also responded to the perceived deficit of public space in dense areas. For example, the City of Edmonton's "Basic planning principles for high-rise residential infill in

mature neighbourhoods" (2007) include a suggestion that high-rise infill projects include both indoor amenity spaces and outdoor social and recreational spaces for residents, and the City of Ottawa's "Urban design guidelines for high-rise buildings" (nd) suggests that public spaces associated with high-rise projects connect and integrate into existing networks of streets, parks, open space, and amenities. Such recognition is noteworthy, as cities are requesting developers to produce non-income-generating space for the public benefit.

A primary challenge for high-rise public space, of course, is that the ratio of available ground-level area per resident is, by the nature of the structures, the most limited of all building typologies (March & Lehrer 2019). This has led to some developments (as noted regarding South Korea above) moving public space to higher levels. To compensate for a lack of ground-floor open space due to the intensive use of land in Singapore, developers have incorporated public spaces into high-rise buildings on raised platforms, podiums, roof deck gardens and skybridges (Menz 2014). Sky gardens in high-rise buildings may offer residents both the social benefits of informal meeting spaces and the mental and physical health benefits of green space (Chan 2005). Some high-rise projects provide internal common space in even more innovative ways. Some examples include the Mirador Building in Madrid, Reliance Tower in Mumbai, the Premier City Project in Almaty, Kazakhstan, Sapphire Residence in Istanbul (Engur 2013), Marina Bay Sands in Singapore (Safdie 2011), and the Raffles City development in Chongging, China (Wang 2017). How well the public spaces in these buildings perform in comparison to ground-based options will be a fertile subject for ongoing study. Some researchers have begun to do this.

During the boom in interest in North American inner-city public housing, Holahan (1976) found that residents of a high-density, low-income neighborhood in New York City relied more on informal social spaces than on formally designed social spaces for neighborhood interaction. For example, formal (linear) seating areas and large grassy areas were far less used and offered less socializing potential than areas that offered a mix of functional, recreational, and leisure uses. (This observation comports with Zarghami & Gheydari (2015), who note that common spaces in high-rise buildings, even those designed for purely functional purposes, can afford opportunities for socialization and, thereby, increase social capital among residents.) More recently, Menz (2014), in his observation of a high-rise building in Singapore, found that the

most popular types of open spaces were playgrounds, open green spaces, and roof terrace gardens. The most common reasons interviewees gave for preferring a public space included

- presence of facilities,
- natural ventilation,
- scenery,
- accessibility,
- density of people present, and
- community networks.

Based upon their observations of how residents in high-rise housing at the University of British Columbia use the public space in their buildings, Daneshpanah et al. (2015) offer the following suggestions for optimizing the quality of internal common spaces:

- Clearly define whether common spaces are appropriate for loud socializing or for quiet studying,
- make spaces large enough to accommodate multiple groups,
- provide amenities (like a café) that facilitate interaction,
- allow space users to modify their environment (for example, by moving chairs),
- make the space easily accessible to all residents,
- provide acoustical isolation to protect private spaces from communal space noise, and
- consider the lifestyle distinctions of potential residents when designing common spaces.

A keen awareness of the special needs that public space serves in high-density environments, and especially in high-rise buildings, will facilitate meaningful observation and measurement of such spaces and how well they are functioning.

Measuring public space

I expected that a primary moderating influence on residents' sense of community would be the quantity and quality of public space. But, how should one quantify and describe public space? What questions should one seek to answer? Fundamental questions suggested by the literature include

- How should one categorize the public spaces to be measured?
- What types of evaluations are instructive?
- What aspects and qualities of these spaces should one measure?

- What procedure should one follow to make these measurements?
- What specific activities are important to record and how should they be recorded?

Some authors have addressed these questions.

Talen (2000) offers suggestions for measuring public open space as it relates to sense of community. She proposes that relevant factors include size, access (distance from residence to open space), "residential grain" (lot density), and "transport environment" (percentage of residential units facing arterial, collector, local, and pedestrian streets). Talen also presents a taxonomy of public spaces that includes

- parks,
- playgrounds,
- squares/plazas,
- community facilities,
- commercial/retail space,
- quasi-public facilities (such as religious buildings),
- and streets.

I believe that all of these spaces are useful to monitor in a study of public space.

Mehta (2014) suggests evaluating public space according to five aspects (shown graphically as a pentagram) including inclusiveness, meaningful activity, comfort, safety, and 'pleasurability.' Similarly, Varna (2016) suggests evaluating the 'publicness' of public spaces according to five aspects (shown, though, as a star) including civility, animation, physical configuration, ownership, and control. Macdonald et al. (2017) offer a rating system that focuses on the quality of the pedestrian environment of neighborhoods. Each paper provides rationales for highlighting its aspects of choice.

In their book *How to Study Public Life*, Gehl & Svarre (2013, p13-19) discuss strategies for evaluating public spaces. They recommend framing evaluations according to key questions such as the following:

- How many? (Taking count of the number of people in a space and noting the time and circumstances of their activities.)
- Who? (Demographic data, such as gender and age, can prove instructive in understanding why a space attracts some people and not others.)

- Where? (Every space has sub-spaces within it with their distinct characteristics.)

- What? (Gehl & Svarre claim that primary public space activities include walking, standing, sitting, and playing. Activities may be categorized in many ways, but the categorization should be intentional.)

- How long? (Duration of individual visits can be just as instructive as head count in an area in estimating how appealing it is.)

Menz (2014), in a study of public space in dense environments in Singapore, proposes a similar list of potential observations, including

- what people were doing,

- where they were doing it,

- how long they did it,

- how they entered the public spaces in which their activity took place,

- who they were (demographic data), and

- what kinds of interactions they had while they were there.

Further to these general questions, Jan Gehl (Gehl & Svarre 2013, p107) suggests a series of specific characteristics to note when evaluating the conditions of a site. They include

- protection against traffic & accidents,

- protection against crime & violence,

- protection against unpleasant sense experiences,

- possibilities for walking,

- possibilities for standing,

- possibilities for sitting,

- possibilities for seeing (fenestration, views, lighting, etc.),

- possibilities for hearing and talking,

- possibilities for playing or unwinding,

- provision of small scale services (notice boards, signs, waste bins, etc.),

- provision of design for enjoying positive climate elements, and

- provision of design for positive sense-experiences.

Having a set list of observations for which to check will be especially important when comparing the activities of different sites according to identical metrics.

What procedures may be useful to make these observations? Gehl & Svarre (2013, p24-34) recommend a variety of procedures for documenting activity in public spaces, including

- counting (as people at a given time, people over a set time interval, or objects),

- mapping (such as locations of people in an area at various times of day),

- tracing (for example, paths of pedestrian or cycling activity),

- tracking (such as routes taken by specific individuals),

- looking for traces (finding evidence of use after people have left an area),

- photographing (to capture a depth of data that would be difficult to record otherwise),

- keeping a diary (as a means of creating a focused record of conditions and events), and

- test walks (to gain understanding of the actual experience of moving through a space).

Many of these techniques were used by observers in Vancouver as part of the "Places for People Downtown" initiative led by Gehl and the City of Vancouver (Gehl + City of Vancouver 2018). Holahan (1976) observed people's use of public space by recording their behavior in ten 30-second intervals as verbal interaction, non-verbal interaction, or isolated activity. He also created an activity map according to (instantaneous) observations of active recreation, leisure activity, or functional activity. It would seem that several observation procedures could provide instructive data, provided the observer is rigorous, detailed, and consistent.

<div align="center">***</div>

In summary, we have discussed the importance of addressing causality, as both the findings of this research and any recommendations that derive from them will imply that certain environmental conditions—and modifications to those conditions—will either effect, or make more likely, certain outcomes. This thinking falls generally into the realm of determinism. After a review of several variants of determinism, we found that no existing theoretical framework is suitable as a basis of this research, and, therefore, we saw the need for a new one. I have dubbed this new framework "Architectural Affordance" and sketched an outline of its assumptions. We have considered the nature of "sense of community" and of "density" and discussed what the current literature has to say about potential influences of density on sense of community. We have looked at the role of public space in this relationship and considered how we might evaluate it. This literature review and discussion have prepared us to move on to a consideration of the research project at hand, beginning with a discussion of the methodology.

Chapter 3: Methodology

To address the primary research question of this study, namely, *What is the relationship between urban density and sense of community?*, I chose to use an explanatory sequential mixed-methods study[19]. I chose this approach because I wanted to inform the study with both quantitative and qualitative data. I wanted to use quantitative data because I wanted the study to be replicable and generalizable and I wanted to use qualitative data because the thing I wanted to measure and investigate is a feeling. The quantitative data came primarily from an online survey and the qualitative data came primarily from in-person interviews. I also conducted site observations. I discuss the formation, data collection and processing, and limitations of these three sources in this section. Many of the items discussed in this section are described further or have related visuals in the appendices.

   The purpose of this study was to investigate the relationship between urban density and residents' sense of community (SOC). This was challenging, because it involved an independent variable, density, that has a variety of accepted metrics (though typically involving a ratio that includes a count of people in the numerator and a measure of area in the denominator), and a dependent variable, sense of community, that is a subjective concept, a feeling with no universally-accepted method of measurement. Density information for the areas included in the study was available from Canadian census data[20], but linking that data to residents' sense of community was more involved.

   To make this connection, I needed to measure the sense of community of a sample of residents in areas of differing densities. Since sense of community is a feeling, the only way to gain information about it is to ask people. However, simply asking people to rate their own level of sense of community (though other studies have done this) would not produce generalizable results, as people would likely have an inconsistent understanding of the question. I discuss my approach to generating sense of community scores below.

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[19] In the prospectus for this study, I assumed I would treat the research as a case study. I thought this would be the most appropriate methodological approach because I expected to have very few survey responses. Since I was able to reach statistical significance with virtually all of my survey questions, I dropped the idea of framing this research as a case study (but retained the use of a mixed methods approach). For a discussion of what a case study is and when its use is appropriate, see 'Appendix L' of this thesis.

[20] This data provides residential density. A study of 'daytime' density, or locational densities when people are at work might also be informative, but is outside the scope of this study (and would require some methodology to gather, or estimate, the relevant temporal population data).

In addition to addressing this primary relationship, I wanted to control for a reasonable suite of potential confounding variables. This was necessary to validate the primary relationship and show that I wasn't measuring the wrong thing. I also wanted to know what factors might moderate the relationship between density and sense of community. The questions I formed to investigate these issues seemed suitable to a survey format.

Other questions, however, I thought would be poorly suited to a survey. For example, I wanted to know more about what people were thinking as they took the survey, such as how they understood the terms used (terms such as "neighbourhood," "sense of community," and "public space"). I also wanted to gather more discussion about how people used the public space in their neighborhoods than I expected I could get from a survey. I thought a few people might be willing to offer expanded answers, but many wouldn't and would not complete the survey if I loaded it down with too many essay questions. Therefore, I chose to include personal interviews in the study, as I expected I could gain insights from this medium that I could not capture in the survey. Since interviewees would come from the pool of survey respondents, I would be able to link their survey responses to their interview responses.

Finally, I conducted site observations. The chosen locations derived from the areas in which the interviewees lived. I intended to investigate the places that interviewees spoke of and conduct quantitative assessments of these sites. Really, my initial intention was for the study to be an *exploratory* sequential mixed methods study (qualitative, then quantitative), with the survey serving only to generate recruits for the interviews (I did not expect to generate significant levels of data with the survey), the interviews being the main source of data, then the site observations providing quantitative backing for the qualitative interview data. As it turned out, the survey produced a large quantity of significant data and the site observations did not, thus turning my exploratory sequential mixed methods study into an *explanatory* sequential (quantitative, then qualitative) mixed methods study.

Survey

The survey for this study was conducted online using Qualtrics software. I saw no other viable media for collecting survey data.

Creating the questions

As noted above, a critical aspect of this study was the ability to link density data to sense-of-community data. I decided that the best metric to form this link was postal code data. I believed that everyone in my target area (see below) would know his or her postal code and most would be willing to share it. Although the postal code region can be small enough to limit one's ability to maintain anonymity, especially if enough related personal data is linked to it (postal codes encompass a much smaller region than the United States equivalent, the 'zip code'), I believed that people would be willing to share it. The finest resolution at which census density data was available was the 'dissemination block' level, but I had no expectation that survey respondents would know what their dissemination block label was (or what a dissemination block was). To link survey data to census data, I had to relate postal code data to dissemination block data. This proved far more challenging than I had expected. The systems are spatially related but readily linked in no other way. Fortunately, the outlines of the postal code regions *generally* fit within the outlines of the dissemination block outlines. By overlaying the two systems and locating the centroids of the postal code regions within the outlines of the dissemination block outlines, I was able to transfer the density data from the dissemination blocks to the postal codes (see figures 1 and 2). Note that the resolution remained at the courser dissemination block level. I don't know why this exercise has not been performed at the national level previously and the postal code/dissemination block relationship made available for public use, but I think anyone needing this connection in the future will have to go through this process.
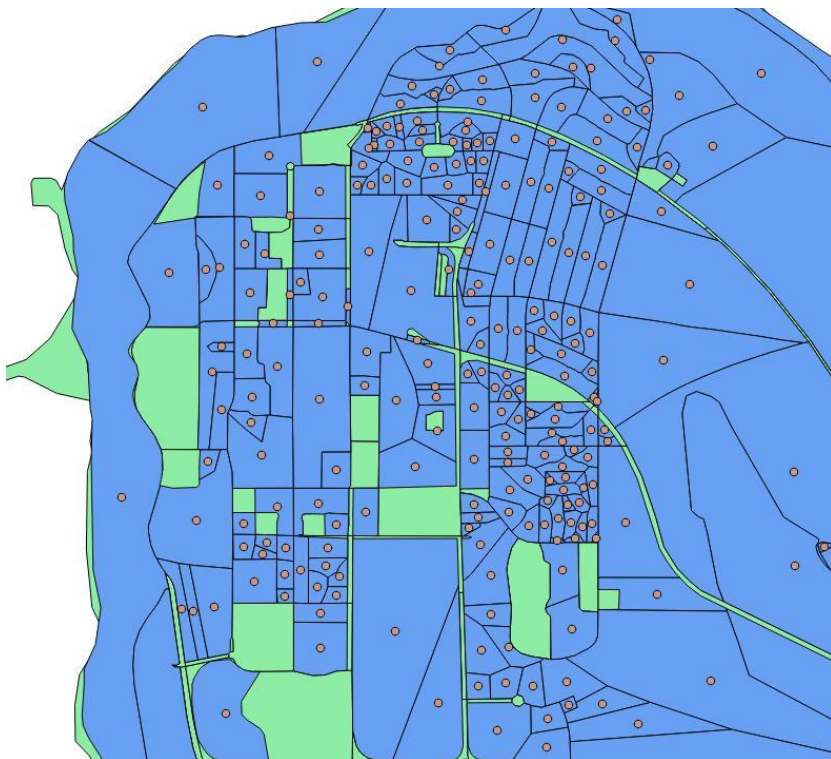
Figure 1 - Postal code outlines (blue areas) with dots showing postal code centroids (green areas show dissemination block areas with no postal code)

Figure 2 - Postal code centroids shown within dissemination block outlines

The most important component of this study was the metric for the dependent variable, sense of community. Although much research has already been done related to measuring sense of community, including an industry-standard measure, the Sense of Community Index (SCI), I felt it was important to investigate how reliable this leading measure (and any similar measures) would be. Appendix 'A' discusses this investigation and details my rationale for creating and selecting the test items I used to create SOC scores for respondents.

In addition to test items (questions) related to sense of community, I also wanted to test for other factors that I thought might be related and that might act as either confounding or moderating variables. I asked questions about demography, as I thought these might significantly influence respondents' sense of community. Since public space was a focus of the study, I asked questions about respondents' use of public space. I especially wanted to understand how use of public space related to residents' sense of community. I also asked about what type of housing respondents live in and whether they felt crowded or unsafe. Previous research has shown a very tenuous relationship between density (an objective measure) and crowding (a negative perception of density), so I saw a need to account for both the relationship between density and sense of community and between feelings of crowding and sense of community (as well as between density and feelings of crowding). Since safety seemed to play a significant role in previous density research, I also tested for feelings of safety (I did no research at all of actual safety, ie, police records and such). Finally, I asked questions related to respondents' previous housing experience. I felt that if respondents had had a substantially better or worse experience in their previous housing situation, this could disproportionately influence their current responses, especially related to sense of community. See Appendix D for a static (offline) representation of the questions used in the survey.

Selecting the target areas

Since this was a study related to high density, I wanted to target areas that included high-density sections. Obviously, this would include urban areas. I also wanted to include proximate areas of medium density for comparison. I was not particularly interested in low-density areas. I felt that the real comparison I was after was in the medium to very-high density range. I wanted to know if my data would suggest what happened to residents' sense of community as urban areas progressed from medium to high to very high density. So, at the outset, I knew my study would focus on at least one urban area.

The next question to resolve was, Which urban area(s) should I try to include? Although there are some cities that naturally lend themselves to studies of density (such as Singapore, Hong Kong, Shanghai, etc.), I felt I had no way to reach potential respondents in distant areas. Besides the language barriers, I had no funds for travel (or for anything else) and no contacts in foreign cities. Although I had no support for outreach and only a poor plan for doing it myself, I decided that my best chance for success at outreach was to keep my study local. This would allow me the greatest opportunity for both initial outreach for my survey and for the subsequent interviews that I intended to conduct. So, I chose the Greater Vancouver Regional District as my general target area. I felt that I could reach any point within this area within a day's trip.

The next step was to decide on which areas within the District I would focus my outreach. I used Google Earth to locate all of the areas within the district that had high-rise buildings (see Appendix B). From this set, I looked for areas that had both very high density sections and medium and high density sections. I thought this would allow me some control over non-proximate factors when I compared the SOC scores from one density level to another. I also looked at the public space of the areas I found. My intent was to 'rate' the public space at the different sites and then later compare the quality of the public space to the SOC scores. I later abandoned this because I didn't have enough qualified areas and because I could not find or create an objective rating system for the quality of the public space.

As a last consideration, I filtered for areas that had a high percentage of families with small children. I was particularly interested in the life quality of this demographic living in high-density environments (where outdoor play spaces were limited). A more detailed discussion of my site selection process is provided in Appendix B.

Advertising the survey

I had no good venues for systematically advertising my survey to my target areas, so it was clear from the outset that I would have to rely on a sample of convenience. I created a table of the sites I wanted to target with my survey and listed any options I could find for advertising (see Appendix C). I used this as a starting point, mostly as locations to post flyers (see Appendix C) both at physical locations and online. I found very few public kiosk locations where I could post flyers. Also, I had no way to track the effectiveness of my outreach actions, so I could only speculate as to how effective any specific outreach was.

In addition to flyering and online posting (I found no opportunity to pass out handbills in person), I sent over one hundred emails to strata and property managers (see Appendix C). By far, the most effective approach was when one property management company (Associa) agreed to advertise my survey in their email newsletter to their residents. Until this point, I had gathered roughly 350 valid responses in over 6 months. After the assistance from Associa, I more than doubled that amount in just over one month. This was very fortunate (and due to the benevolence of one advocate out of hundreds of persons contacted). Since I had no funds for outreach by mailer (which would have cost thousands of dollars for postage alone), this was really the only way I was able to reach residents in high rise buildings. Unfortunately, they weren't necessarily located in just my target neighborhoods, but the results were useful anyway. Of the six areas I targeted, only two (UBC and Port Moody) returned enough results to evaluate. On the other hand, due (I suppose) to paid advertising through Facebook (targeting the Vancouver area) and through help from Associa, I ended up with results all over the Greater Vancouver Regional District.

Processing the data

I ran the survey for nine months, from December 2018 through August 2019 (with a few early returns in November as I was proofing the survey). Qualtrics allows for download into a variety of software formats. I downloaded my data into an Excel format. Valid responses required postal code data and most SOC items completed. I calculated aggregate (average) scores for SOC, feeling of crowding, and feeling of safety. Appendix E shows the variables, response types, data types, and response options used in the survey. I used QGIS and Access to create the density scores for the postal codes and link them to the survey data.

Analyzing the data

After cleaning and arranging the data, I used PSPP (similar to SPSS) to calculate correlation coefficients and p-values (using the Spearman method) for the primary dependent variable (dv) and independent variable (iv) and other relationships (see Table 4 in Findings – Survey responses). I used QGIS to visually evaluate the relationship of SOC scores to density (see Figures 10 – 15 in Findings – Survey responses). I used Tableau to create scatterplots of the various relationships I evaluated (see examples in Findings – Survey responses).

Limitations

The survey component of the study had several limitations. First, it was not possible to make this survey both randomized and statistically significant given the number of variables involved and sample size I had. Second, I had no budget to advertise it (though I did spend some money for Facebook ads). I offered four drawings for $25 prizes (all paid), but it is questionable how much of an incentive this was. Third, there was an unavoidable sample bias in the survey toward those who were willing to take it. How this willingness correlated to respondents' SOC score (thus skewing results), I have no way of knowing, but I suspect that it would skew the results toward higher SOC scores because I imagine that people with a higher sense of community would be more likely to participate in community-related things in general and in sense-of-community-related things in particular. Since I was able to compare SOC scores over a full spectrum of densities, this potential skewing probably isn't significant. Still, one might suggest that the sample is biased.

A fourth limitation was the density resolution, which I applied to the postal code level as derived from the larger dissemination block level. I believe the sample size was large enough to overcome this error, but it still remains unaccounted for. It might be possible to produce more accurate results by manually counting densities of postal codes, but this level of effort was beyond the scope of this study. Further to this limitation was the currency of my population density data. The census data was a few years old at the time I processed my survey data. Some of my respondents lived in neighborhoods that were so new, the dissemination block data still showed a population of zero. Also, the results may be highly dependent upon the scale of areas that I used for my density data. The dissemination block was the smallest unit of density I had, but I could have chosen a larger unit, such as the dissemination area, the next unit larger. To test the potential difference in findings, I chose a subset of my results (the UBC area) to test the potential difference between dissemination block densities and the densities of the dissemination areas within which they lie. I found, as I suspected, that the densities were very dissimilar. For the area I examined, I found that the correlation coefficient between dissemination block densities and their associated dissemination area densities was only 0.26 (n = 44) (although it went up to 0.48 (n = 29) for dissemination block densities under 10,000 persons per square kilometer). Also, the correlation between sense of community scores and density for this area varied drastically, being effectively nil (0.03 (n = 35)) when using dissemination block densities

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and substantial (0.41 (n = 35)) when using dissemination area densities. This suggests that my overall results would be very different if using densities of larger scales. Whether they would be any more *accurate* or *meaningful* are matters for theory and interpretation in future research.

Finally, the survey was very long. In my interest to be comprehensive, I included many topics in the survey. Future researchers interested in conducting a similar study would do well to review the findings and consider whether some or many items could be pruned without deficit.

Lessons learned

Generally, the survey was successful. All of the data gathered was useful to the study and speaks to either the primary question or to issues that critics might raise against the answer to the primary question. On the other hand, after reviewing the findings, it seems that future studies of similar intent could be much shorter without losing needful context. Still, I don't think this could have been known prior to running the survey. One clear win was the use of new test items for SOC metrics. As will be seen in the Findings – Survey results, future studies of sense of community would likely do better to use just two of the test items of this study instead of other indices used previously, based on the results of this study.

Interviews

The purpose of the interviews was to gain insights that would have been difficult to obtain from the survey format, such as what people were thinking as they took the survey. What did they have in mind when they answered questions about their neighborhood or the public spaces in it? What did they think sense of community was? How did their SOC score compare with their own evaluation of their sense of community? These were the kinds of things I hoped to probe in the interviews.

Creating the questions

Creating the survey questions was fairly straightforward once I was clear in the perspectives I wished to gather from the interviewees. These perspectives related to meanings of terms, perception of neighborhoods, perceptions of public space, opinions about crowding, density, and safety, and issues of how culture and personal connections might influence sense of community. The set of interview questions is presented in Appendix 'F'.

I formed the interview questions prior to beginning the survey. Of the three common interview formats (structured, semi-structured, and open), I chose to conduct semi-structured interviews. I thought this was appropriate because the survey had already provided structured response data and open surveys would not provide sufficient control over the discussion to be able to compare different interviewee responses later. I thought that the semi-structured format would allow me to generate comparable data but also allow for discussion and divergence as I saw fit. After conducting the interviews, I believe this was the right decision. I intended to update the interview questions after reviewing the survey responses so as to better probe unresolved issues presented by the survey. However, after an initial review of the survey responses, I saw no need to amend the interview questions from what I had proposed at the outset.

Selecting interviewees

I recruited interviewees through the survey (which asked, at the end, if respondents would be willing to sit for a half hour to one hour interview). Initially, this was the primary purpose of the survey (as a recruitment tool). This proved effective, as 253 respondents (just over a quarter of the total) agreed to be interviewed. Of these, I selected about two dozen who were located in the sites I had selected (and a downtown area that I added because it generally met my selection criteria). Of these, I managed to successfully set up interviews with 15 people in three different sites. Since recruits entered their contact information in the survey, I could connect their survey responses with their interview information. Since I only intended to use the interview data for qualitative research ("explaining" the previously conducted quantitative data), there was no minimum sample size required. In fact, I interviewed as many people as I could get from the sites I had selected. I could have performed more interviews (of the 253 volunteers), but this would have been a burdensome addition to the study. As it was, conducting and processing the 15 interviews was a substantial amount of work and generated, I believe, adequate results.

Conducting the interviews

I asked the interviewees to name a public location in their neighborhoods in which to conduct the interviews. All of the interviewees knew of a local coffee shop in which to meet, so the interviews took place at coffee shops. These were pleasant venues. I offered to buy the

interviewees coffee and gave them the honorarium prior to the interview. I also got permission to record the interviews.

Processing the data

I used Rev to transcribe the interviews. While this was expensive (over $1,000), it saved me a considerable amount of time. I reviewed the transcripts for accuracy and made corrections as needed. Then I divided the transcripts according to the questions of the interviews. Using Access, I created a database that included the answers from each interviewee from both the survey and the interview. I then created profiles for each interviewee (Appendix G) and collections of responses to each interview question (Appendix H). I also created a collection of notable exchanges that I thought could be enlightening if read in their entirety (see Chapter 6).

Analyzing the data

Since these were semi-structured interviews, the answers were pre-sorted and did not require extensive coding, as they would have in an open survey. Also, in creating the database of interview answers, I reviewed the responses extensively and in depth and sorted them as according to content, such that further coding would have added very little organizational value. Still, I had to look for patterns and commonalities among the responses and consider how each response and set of responses spoke to the issues I was investigating. I had to evaluate the best way to show the answers and explain what I thought was relevant to the study.

Limitations

The primary challenge was finding potential interviewees in my target areas. I certainly had no shortage of potential interviewees generally, but the challenge of finding them in my target areas can be seen as an extension of the challenge of targeting my advertising in the sites I wanted. I was also limited by a lack of diversity in my interviewees. Of the 15 interviewees, only one was male. Also, the age of most was fairly high. Again, I did not screen by demographics--I just had a disproportionate number of middle-aged and older females. While not all were white, most were. Of course, all spoke English, but some spoke other languages as well. Also, while I maintain that the semi-structured interview format was the most appropriate, an open format, or even group interviews, might have produced broader results.

Lessons learned

The use of a survey to recruit interviewees was very effective. It allowed me to screen interviewees beforehand. In this case, I only screened for location, but potentially, I could have screened for other factors as well. For example, if I had had more recruits than I needed, I might have screened for diversity or to include parents of small children (a demographic I was especially targeting). Also, I speculate that the survey was effective for recruitment because it allowed recruits to invest only a small amount of their time and yet become exposed to the intent of the survey. Those who found the topic engaging could then opt to make a further time (and trust) commitment of an hour for the interview. And, again, I found the format and venues to be very effective.

After conducting the interviews, I think I would modify some of the questions for future interviews. Although I wanted to know how interviewees would self-rate their sense of community, I never came up with a good question for this. The question I used was "*How would you describe your sense of community in your neighbourhood?*" But, interviewees didn't really know how to answer this question, even with added prompting, and it didn't produce very useful responses. After asking "*Do you speak with your neighbours in these* (public) *spaces?*" I asked the follow-up question "*What types of things do you usually discuss?"* but I don't think the latter question was useful. I asked the question "*Do you wish you spent more time or less time speaking with your neighbours?*" and got interesting responses, but I think it would have been better to provide context by first asking "*How often do you speak with your neighbours?*" Finally, after I ask "*Which communities or groups do you feel connected to?*" I ask the follow-up question "*How would you rank the importance of your connection to these groups?*" I wanted to understand whether outside connections were displacing neighborhood connections, but the question felt too invasive and produced inconsistent results.

Site Observations

The purpose of conducting site observations was to examine the environments described by the interviewees. Initially, I intended to conduct extensive site observations, but, in the end, I conducted only 16 site observations. While useful for many questions, I felt that the observations were not particularly instructive for this study, as they could not address the question of how people were feeling. They could address what people were doing (and where

and how and with whom and such) but not whether their activities were leading to an increased sense of community.

Selecting sites

I selected sites to observe based on the areas in which I had interviewees. In the end, this had little utility, as the sites were not so particular that other sites mightn't have been just as instructive. But, I was following my own protocol and intention of linking sites to interviews (and, to survey data). Of the six sites I initially chose, I had interviews from only two (UBC and Klahanie (a neighborhood in Port Moody)). At UBC, interviewees came from three (or four) distinct neighborhoods, so I conducted one site observation at Klahanie and three site observations at neighborhoods in UBC. At each of these four neighborhoods, I observed activity at four different locations for an hour each.

Selecting metrics

For each site, I was primarily trying to answer two questions, namely *How much do people interact here?* and *What is this place like?* To address these questions, I formed a template that I could use to record both how many people were in a place and how many people were interacting in that place over five-minute intervals. For the second question, I considered work by urban researchers (such as Jan Gehl) to form a set of questions to answer about each location. Appendix I shows the template I formed for the site observations.

Conducting observations

It was difficult to know how much time to invest in doing the site observations. It would have been difficult to argue, no matter how much time was spent, that the observations were sufficient to describe the comings and goings of people during different times of the day, different days, and different seasons. Also, whatever time investment I arbitrarily decided was 'sufficient' for a site observation would have to be multiplied by 16, the number of locations I wanted to observe. I decided that one hour each would prove to be roughly as instructive as two and only take half as much time. I quickly extended this reasoning to conclude that spending more than an hour at each location would be both prohibitive and of diminished return. Less than an hour each, however, seemed useless (and lazy). I conducted the site observations over a series of Saturday mornings in August of 2019, filling out my templates as I went.

Processing data

There was relatively little to process, other than some very basic math, after the site observations were done. I had collected a substantial amount of data about the sites, but, as I had no way to connect this data to my primary research question, I spent little time evaluating it. The results are shown in Appendix J.

Limitations

The two biggest limitations of this site observation process were time and applicability. The site observations are very time intensive for the amount of data they generate. Also, they are poorly suited to addressing questions about perception. Other limitations include the challenges of comparing one site to another (what makes one coffee shop 'successful' and another not, and how do you know?) and generalizing findings. I think with a large enough data set, one could use the templates I developed to produce generalizable arguments, but this level of involvement lay outside the scope if this inquiry.

Lessons learned

I think a future study of sense of community would also have limited use for site observations. Related studies, however, such as studies of who uses public space and for what could make excellent use of the templates developed for this study. I found few references that informed methods for evaluating public space and none that provided a template such as I developed. A future study that included similar site observations should provide justification for the range of times and sites that it would cover and make sure it had sufficient resources to complete such observations.

Chapter 4: A quantitative inquiry into the relationship between urban density and sense of community in the Greater Vancouver Regional District

This section discusses the findings of the study. As this is a mixed-methods study, I will present both survey data and interview data in this section. Some findings incorporate data from both the survey and the interviews. Other findings are limited to one or the other medium.

Discussions of each finding from the survey data will generally include the following topics, unless they have been addressed previously:

- Reason—why I chose to produce data that would inform the finding;
- Measurement—why I chose the metrics involved in the finding;
- Test—why I chose the statistical test that I used to analyze the data;
- Relationship—the strength and direction of the relationship between the data items; and
- Relevance—the implications of the relationship

I will discuss the broader implications of the findings and their relationship to previous research in the Discussion section.

The relationship between urban density and sense of community

As noted earlier, the primary purpose of this study is to see if a meaningful relationship exists between neighborhood sense of community and urban density. The intent of this inquiry, in particular, was to note whether residents' sense of community (SOC) diminished at very high urban densities, and, if so, whether any factors might moderate this relationship.

As noted in the Methodology section, I used a set of 26 5-point Likert-scale questions to form a composite sense of community average score for each survey participant. In order for a survey entry to be valid, a participant had to complete the sense of community questions. To measure density, I used data from the 2016 Canadian census. A particular challenge was translating density data from the census at the 'dissemination block' level to the Canada Post postal code level (smaller areas that generally fit within the dissemination blocks). I used Geographic Information System (GIS) software to accomplish this translation, and ended with a 'persons per square kilometer' value for most of the postal codes used in my study.

Although the statistical test I used did not require breaking density values into categories, I thought it would be useful to set these boundaries for comparison. As noted earlier, 'low,'

'high,' and other categories for density levels are subjective and relevant only to specific areas under consideration. To set these subjective levels for the area of my study, the Greater Vancouver Regional District, I used a 'natural breaks' function in the GIS software and rounded somewhat to achieve a range of density categories ranging from very low (less than 600 people per square kilometer) to very high (more than 6700 people per square kilometer), as noted in Table 2.

The statistical test most appropriate for comparing ordinal data, such as that produced by a Likert-scale test, is the Spearman test. This is the test I used to find correlation coefficients and significance levels for my survey data.

The relationship between sense of community (SOC) and urban density was very weakly negatively correlated, as shown in the scatterplot in Figure 3, by the correlation coefficient (-0.065) in Table 2, and by the maps in Figures 10 – 15. This relationship is the primary finding of the study. Additional to this general trend, I looked at the same relationship as broken into the density categories referred to previously. These relationships are shown in Figures 4 – 8. Note that while all density categories are very weakly related, it is the 'very high' category that is mostly responsible for the overall negative relationship found in aggregate. Also, as I was particularly interested in the possible effects of density on sense of community for families with small children, I specifically noted the density/SOC relationship for this demographic. The results (weakly positive) are shown in Figure 9.

The relationship between sense of community and urban density is significant primarily for what it does not show, namely a strong correlation at any density level. While it is interesting that the relationship trends downward at the very high density category (after trending upward at the high density category), the fact that the relationship is very weak is important, and is potentially good news for advocates of increased urban densities, as it suggests that residents in very dense urban environments may experience a sense of neighborhood community that is just as high as that of residents in any other density category.

SOCvDensity
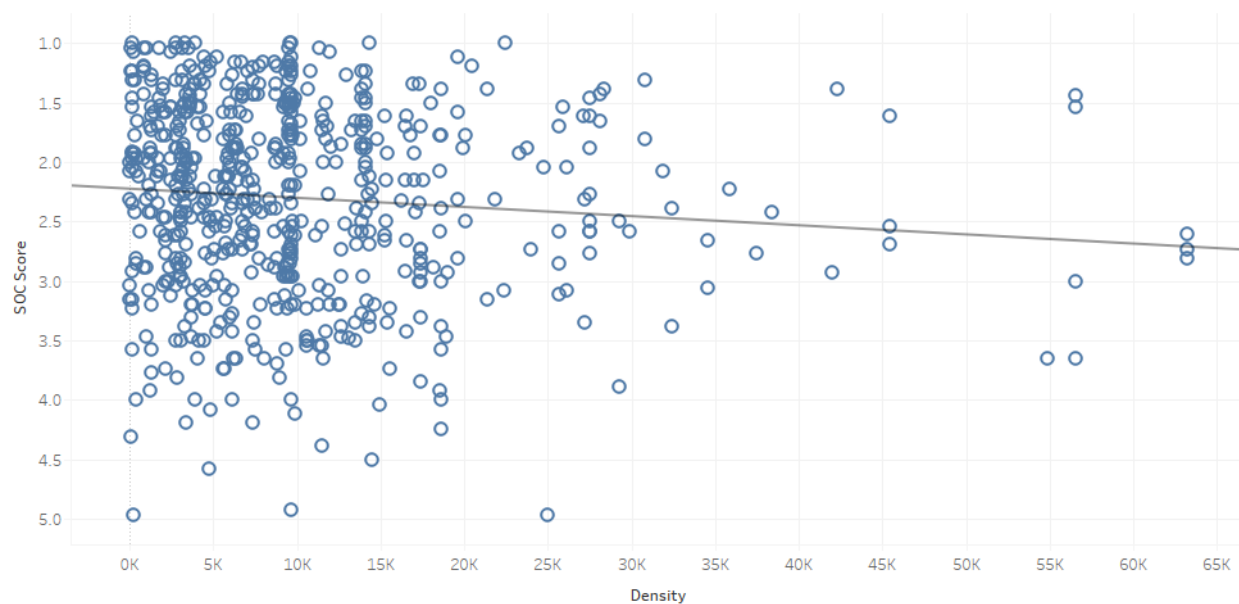
Density vs. SOC Score.

Figure 3 – Relationship between sense of community and urban density (SOC of 1.0 is highest)

General question	Test Item	N	corre-lation	p
How does SOC correlate with density?	among all responses with density data	634	-0.065	0.102
	at the very low quintile range[21]	39	0.047	0.775
	at the low quintile range	76	-0.048	0.677
	at the medium quintile range	82	0.133	0.234
	at the high quintile range	89	0.134	0.212
	at the very high quintile range	353	-0.116*	0.030
	for families with children aged 5-9	76	0.204	0.076
How does SOC correlate with various test items?	age	886	0.278***	0.000
	(male) gender	902	0.014	0.681
	number of people are in household	882	0.111**	0.001
	number of children in household	896	0.136***	0.000
	home ownership	898	0.128***	0.000
	annual income	840	0.149***	0.000
	amount spent on rent or mortgage	836	-0.055	0.111
	a feeling of connection to family	910	-0.148***	0.000
	a feeling of connection to co-workers or school friends	910	-0.002	0.946
	a feeling of connection to a religious group	910	-0.049	0.139
	a feeling of connection to a political group	910	-0.034*	0.030
	a feeling of connection to a sports or hobby group	910	-0.111**	0.001
	a feeling of connection to an online community	910	-0.025	0.447
	length of time at address	905	0.194***	0.000
	use of a building common space	857	-0.027	0.435
	use of a walkway	870	0.133***	0.000
	use of a park	874	0.218***	0.000
	use of a playground	858	0.192***	0.000
	use of a community center	868	0.215***	0.000
	use of a cafe	863	0.140***	0.000
	use of a grocery store	866	0.052	0.128
	use of a non-grocery store	863	0.098**	0.004
	interaction at a building common space	836	0.200***	0.000
	interaction at a walkway	857	0.494***	0.000
	interaction at a park	845	0.454***	0.000
	interaction at a playground	835	0.326***	0.000
	interaction at a community center	847	0.380***	0.000
	interaction at a cafe	842	0.392***	0.000
	interaction at a grocery store	847	0.403***	0.000
	interaction at a non-grocery store	827	0.389***	0.000
	(increasingly dense) housing type	870	-0.157***	0.000

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[21] Density quintiles for this study were set as follows: very low < 600; low = 601 - 2800; medium = 2801 - 4200; high = 4201 - 6700; very high > 6700. These were calculated by rounding from the natural breaks in the data of 0, 594 , 2839, 4222, 6716, 454783. Units are people per square kilometer. Data taken from Canadian census. See Methodology section for method used to apply census data to postal code areas. See appendix for visual examples of density levels.

General question	Test Item	N	correlation	p
	single-family housing type	910	-0.155***	0.000
	low-rise attached housing type	910	-0.033	0.321
	low-rise apartment housing type	910	0.098**	0.003
	high-rise apartment housing type	910	0.074*	0.026
	presence of a neighbourhood association	634	0.058	0.143
	involvement in a neighbourhood association	478	0.217***	0.000
	feelings of crowding	864	-0.320***	0.000
	feelings of safety	864	0.368***	0.000
How do various test items moderate the relationship between SOC and Density?	age	624	0.038	0.348
	(male) gender	637	-0.061	0.123
	number of people are in household	625	-0.016	0.686
	number of children in household	630	-0.007	0.866
	home ownership	634	0.001	0.982
	annual income	597	0.041	0.313
	amount spent on rent or mortgage	593	-0.003	0.937
	a feeling of connection to family	639	-0.112**	0.005
	a feeling of connection to co-workers or school friends	639	-0.035	0.371
	a feeling of connection to a religious group	639	0.060	0.132
	a feeling of connection to a political group	639	0.021	0.601
	a feeling of connection to a sports or hobby group	639	-0.030	0.443
	a feeling of connection to an online community	639	0.012	0.756
	length of time at address	636	-0.096*	0.015
	use of a building common space	608	0.058	0.155
	use of a walkway	617	0.063	0.120
	use of a park	616	0.029	0.469
	use of a playground	612	-0.019	0.643
	use of a community center	618	0.056**	0.016
	use of a cafe	613	0.083**	0.040
	use of a grocery store	615	0.133**	0.001
	use of a non-grocery store	611	0.140**	0.001
	interaction at a building common space	597	0.068	0.096
	interaction at a walkway	608	0.030	0.462
	interaction at a park	601	0.085*	0.037
	interaction at a playground	598	0.013	0.756
	interaction at a community center	606	0.046	0.260
	interaction at a cafe	601	0.070	0.088
	interaction at a grocery store	605	0.084*	0.039
	interaction at a non-grocery store	591	0.004	0.923
	(increasingly dense) housing type	618	0.038	0.345
	single-family housing type	639	0.127**	0.001
	low-rise attached housing type	639	-0.056	0.157
	low-rise apartment housing type	639	-0.068	0.087
	high-rise apartment housing type	639	0.035	0.372
	the presence of a neighbourhood association	440	0.149**	0.002
	involvement in a neighbourhood association	328	-0.117*	0.034

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General question	Test Item	N	correlation	p
	feelings of crowding	607	-0.053	0.196
	feelings of safety	609	0.083*	0.040
How does SOC correlate with past experience?	How does SOC correlate with previous home being a particular (increasingly dense) housing type?	847	-0.099**	0.004
	How does SOC correlate with most of life lived in a particular (increasingly dense) housing type?	819	-0.077*	0.028
	How does SOC correlate with use of a building common space in previous neighbourhood?	795	-0.012	0.734
	How does SOC correlate with use of a walkway in previous neighbourhood?	821	0.087*	0.012
	How does SOC correlate with use of a park in previous neighbourhood?	815	0.135***	0.000
	How does SOC correlate with use of a playground in previous neighbourhood?	808	0.107**	0.002
	How does SOC correlate with use of a community center in previous neighbourhood?	811	0.115**	0.001
	How does SOC correlate with use of a cafe in previous neighbourhood?	809	0.121**	0.001
	How does SOC correlate with use of a grocery store in previous neighbourhood?	820	0.125***	0.000
	How does SOC correlate with use of a non-grocery store in previous neighbourhood?	794	0.123***	0.000
	How does SOC correlate with a feeling that current neighbourhood is safer than previous?	844	0.232***	0.000
	How does SOC correlate with a feeling that current neighbourhood is more crowded than previous?	845	-0.057	0.100
	How does SOC correlate with a feeling that one has more sense of community in current neighbourhood than in previous?	843	0.538***	0.000
	How does SOC correlate with importance of having sense of community in current neighbourhood as compared to previous?	842	0.341***	0.000
How does perception of crowding correlate with density and housing type?	How does perception of crowding correlate with density?	610	0.111**	0.006
	How does perception of crowding correlate with (increasingly dense) housing type?	855	0.113**	0.001
	How does perception of crowding correlate with single-family housing type?	864	0.174***	0.000
	How does perception of crowding correlate with low-rise attached housing type?	864	-0.037	0.273
	How does perception of crowding correlate with low-rise apartment housing type?	864	-0.059	0.085
	How does perception of crowding correlate with high-rise apartment housing type?	864	-0.046	0.173
How does perception of safety correlate with density and housing type?	How does perception of safety correlate with density?	610	-0.078	0.055
	How does perception of safety correlate with (increasingly dense) housing type?	855	-0.126***	0.000
	How does perception of safety correlate with single-family housing type?	864	-0.156***	0.000
	How does perception of safety correlate with low-rise attached housing type?	864	-0.004	0.916
	How does perception of safety correlate with low-rise apartment housing type?	864	0.077*	0.023
	How does perception of safety correlate with high-rise apartment housing type?	864	0.034	0.316

Table 2 - Survey results

Direction of correlations as noted. Significance indicated as * = p < 0.05, ** = p < 0.01, *** = p < 0.001. Strengths of correlation coefficients considered 'very weak' below 0.2, 'weak' between 0.2 and 0.4, 'moderate' between 0.4 and 0.6. 'strong' between 0.6 and 0.8, and 'very strong' over 0.8. Most correlations were very weak.
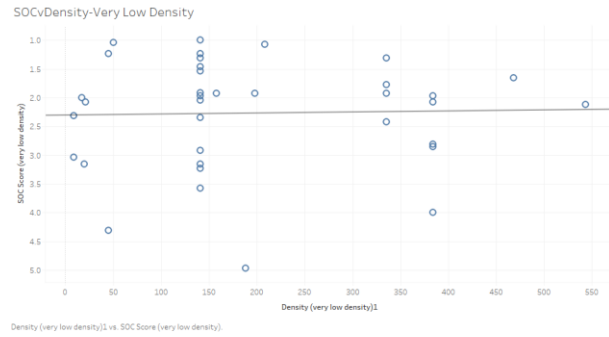
Figure 4 - Relationship between sense of community and urban density at very low density (SOC of 1.0 is highest)
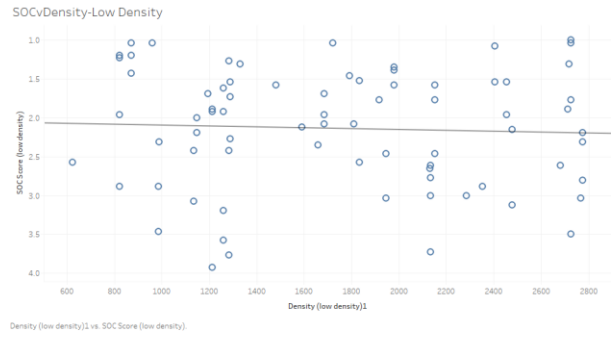
Figure 5 - Relationship between sense of community and urban density at low density (SOC of 1.0 is highest)
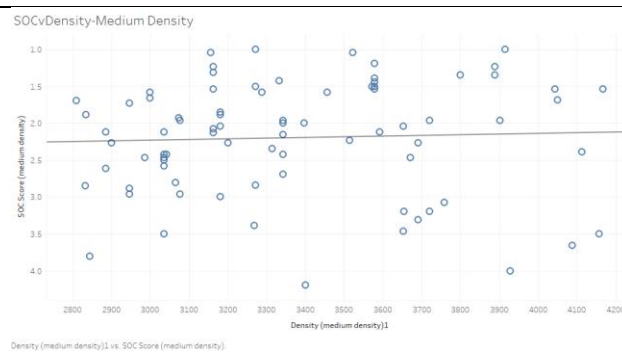
Figure 6 - Relationship between sense of community and urban density at medium density (SOC of 1.0 is highest)
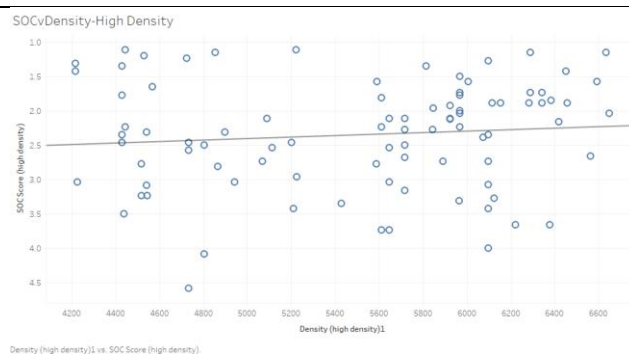
Figure 7 - Relationship between sense of community and urban density at high density (SOC of 1.0 is highest)
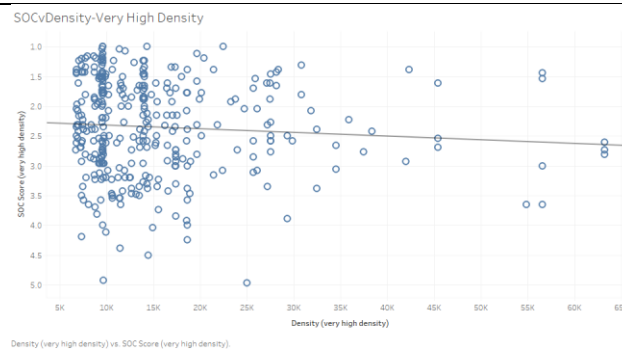
Figure 8 - Relationship between sense of community and urban density at very high density (SOC of 1.0 is highest)
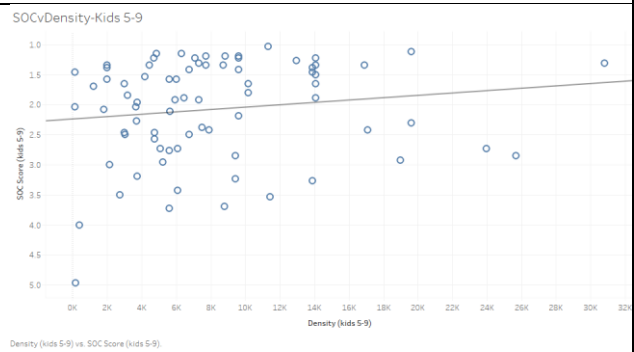
Figure 9 - Relationship between sense of community and urban density for parents with young children (SOC of 1.0 is highest)

Figure 10 - Map of density by postal codes in Kitsalano and downtown Vancouver (darker grey represents higher density)

Figure 11 - Relationship between sense of community and urban density in Kitsalano and downtown Vancouver (green is highest SOC, red is lowest SOC)

Figure 12 - Map of density by postal codes in and near the Klahanie area (darker grey represents higher density)

Figure 13 - Relationship between sense of community and urban density in and near the Klahanie area (green is highest SOC, red is lowest SOC)

Figure 14- Map of density by postal codes at the University of British Columbia (darker grey represents higher density)

Figure 15- Relationship between sense of community and urban density at the University of British Columbia (green is highest SOC, red is lowest SOC)

Potential confounding variables

Many factors may influence one's sense of community. To understand the influence of urban density (the study's primary independent variable) on residents' sense of community (the dependent variable), it is important to consider other factors (secondary independent variables) that may also influence sense of community. While it is impossible to verify which factors may or may not influence sense of community, I sought to test factors I thought would be most likely to do so based upon my review of related literature. Figure 16 below represents these factors, along with the principal independent variable of the study, urban (residential) density.
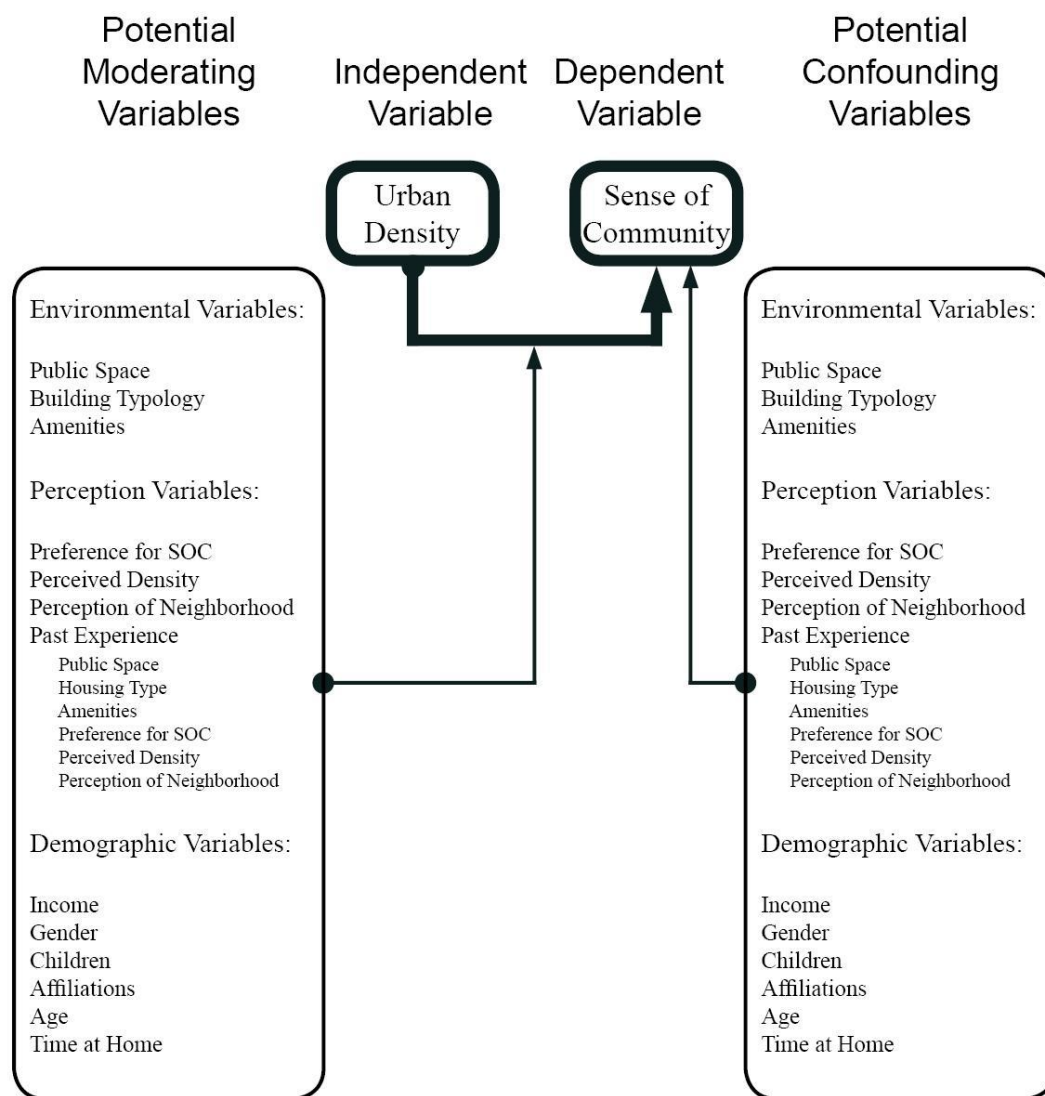
Figure 16 - Potential influences on sense of community and on the relationship between urban density and sense of community

To measure these secondary independent variables, I included questions related to demographics (such as age, gender, and income), use of public space, interaction in public space, housing type, presence and involvement in neighborhood association, feeling of crowding, and feeling of safety (see test items in appendix and results in Table 2, above). As noted above, I used a Spearman test to compare the independent variables to the dependent variable. This test was suitable, even though the independent variables included ratio data (such as number of people in household), ordinal data (such as household income, which was presented in brackets), and nominal data (such as gender). All of these were tested against the dependent variable, SOC, which, as noted above, was a ratio-data calculated average of several Likert-scale (ordinal data) items.

The results of these tests are shown in Table 2 above and in Figures 17 through 20 below. Of the demographic variables, only age had more than a very weak relationship with SOC. As a positive relationship, this suggests that the respondents tend to have a stronger sense of community as they age.

Although many factors showed only very weak relationships with sense of community, the direction of the relationships can still be instructive. For example, SOC relates positively with income, home ownership, and length of time at residence, but negatively with amount spent on housing.

Of particular interest to this study was whether social contacts outside of the neighborhood would have a negative influence on neighborhood sense of community by reducing the need to satisfy one's need for connection within the neighborhood. The negative correlations between (neighborhood) SOC and connections to groups outside of the neighborhood tend to support this supposition.

The survey also investigated both use of, and reported levels of interaction in, local public space. This was a key area of investigation, as type, amount, and quality of public space are some of the very few factors that developers and city officials may be able to adjust when planning new neighborhoods. The results suggest that some types of public space are more positively related than others to residents' sense of community. Examples of public spaces that have a greater-than-average positive relationship with SOC include parks and community centers (see Table 2 and Figure 17).

Even greater correlations exist for variables related to interaction in public spaces. This is reasonable, as it involves more of a behavioral component rather than simply use of public spaces (without interacting with others). Independent variables in this category involving interaction in local walkways, parks, and grocery stores scored the highest correlations in the study (see Table 2 and Figure 18). While this data provides a strong argument for the inclusion of such spaces in neighborhoods as a strategy for increasing sense of community, it is also of limited practical value, in that neighborhood planners cannot provide interactions, but only the venues for interactions. As we see in Table 2, of the three spaces noted for a 'moderate' correspondence in the public space interaction category, only one, parks, scores above 'very weak' for public space use.
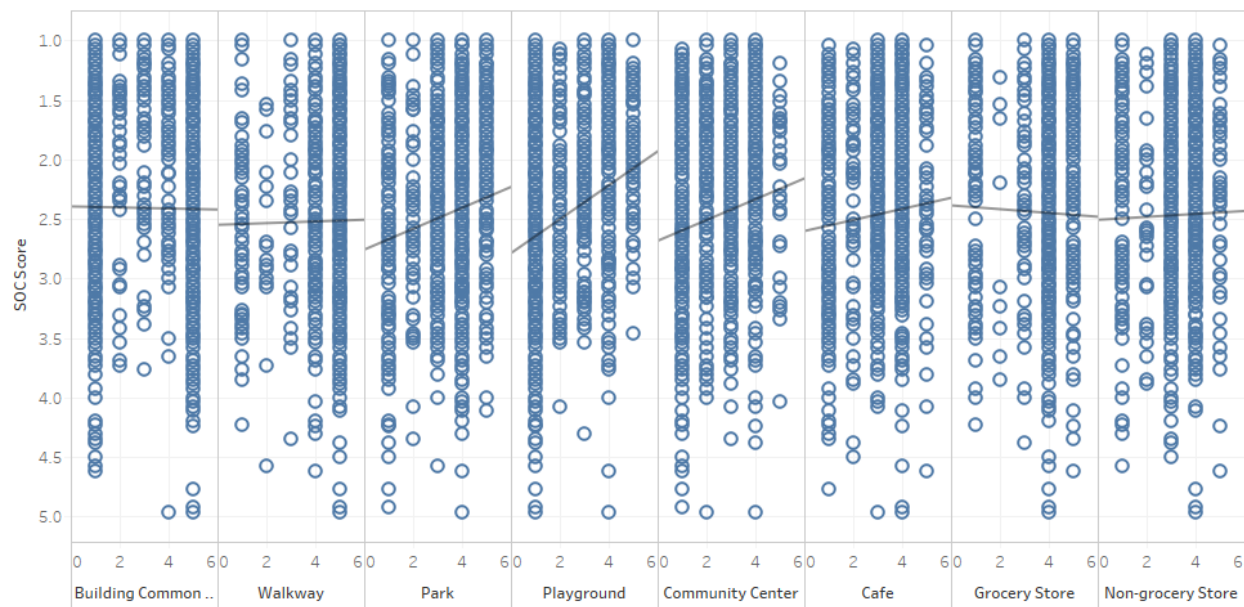
Building Common Space, Walkway, Park, Playground, Community Center, Cafe, Grocery Store and Non-grocery Store vs. SOC Score.

Figure 17 - Relationship between sense of community and use of public spaces

SOCvInteraction

I-Building Common Space, I-Walkway, I-Park, I-Playground, I-Community Center, I-Cafe, I-Grocery Store and I-Non-grocery Store vs. SOC Score.
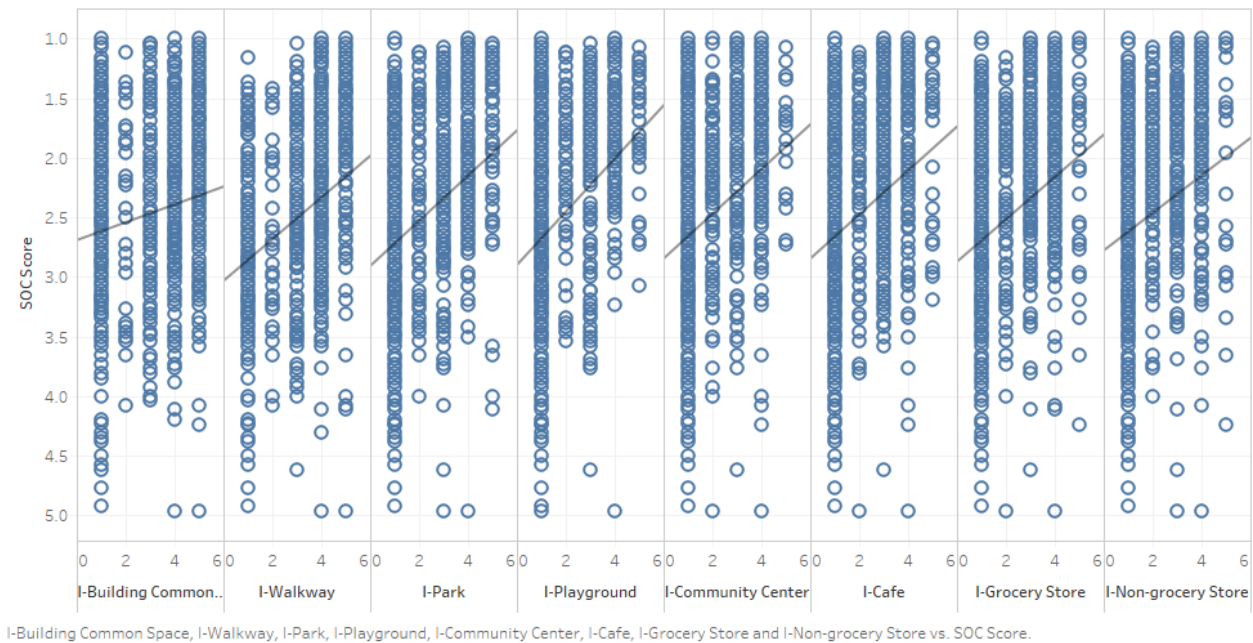
Figure 18 - Relationship between sense of community and interaction in various public spaces

Housing typology is not directly related to density, but it is closely related and represents both a useful proxy and a good point of comparison. Clearly, single-family detached housing is less dense, at least in practice, than high-rise housing (the Corbusian tower-in-a-field typology is virtually unknown, likely as a result of market forces), though attached single family housing and low-rise apartment housing may have density ranges with a high percentage of overlap. This study looked at both the correlation between housing type (as a range from single-family detached to high-rise apartment) and SOC, and the individual correlations between the four housing types considered (see methodology for a discussion of how the housing types considered were selected) and SOC.

At first look, there seems to be a very weak, but clear (correlation coefficient = -0.157; significance = 0.000), negative relationship between increasingly dense housing typology and sense of community (see Table 2). This would suggest that residents' sense of community in single-family detached housing would be slightly—but definitively—higher than residents' sense of community in high-rise apartment buildings. However, when we disaggregate the results by typology, we notice that the results for the single-family detached/SOC correlation (correlation coefficient = -0.155; significance = 0.000) are very similar to the overall results, and may, in fact, disproportionately influence the overall results. I suggest this because the two lower-

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density types (single-family detached and low-rise attached) have a negative relationship with SOC, whereas, the two higher density types (low-rise and high-rise apartment) have a positive relationship. Thus, the individual relationships run counter to the aggregated relationship (and the primary density/SOC relationship). In any event, it seems the relationship between housing type and SOC is very weak.

The study also looked at the potential influence of neighborhood associations on sense of community. A neighborhood association may take many forms. It may be effective or not, highly or poorly representative of the views of the neighbors, congenial or antagonistic, harmonious or fractured, having paid or volunteer members who are either elected or appointed and whose decisions may be either enforceable or easily ignored. It may be formed through strictly grass-roots initiative, by fiat of some higher authority, or incentivized to form and continue by some external entity. To the extent that it can be incentivized, it becomes another tool that neighborhood planners may consider if they wish to influence residents' sense of community.

I asked both whether survey respondents were aware of the presence of a neighborhood association and whether they were involved in any way with the neighborhood association (if they answered yes to the first question). Awareness of the presence of a neighborhood association had a very weak positive relationship with SOC, and involvement had a weak positive relationship. I think these results are fairly intuitive.

Another special interest of the study was the relationship between sense of community and feelings of crowding. Crowding, in this sense, is a negative reaction to excessive density. I devised several Likert-scale questions (see appendix) based upon a review of relevant literature related to crowding. I averaged the responses to these questions to create a single score for respondents' feelings of crowding. As has been shown in several studies, including this one (see below), there is a very weak correspondence between crowding and density. Still, it is fundamental to this study to understand whether the relationship between density and SOC can be framed in terms of a relationship between SOC and crowding (or whether it represents a relationship between SOC and some other aspect of density). It is particularly important to see whether the relationship between SOC and crowding is in the same direction as the relationship between SOC and density. As we can see from Figure 19, it is. As we also might expect, it is

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stronger (weak) than the SOC/density relationship (which is very weak). (See below and Figure 21 to see the very weak but positive relationship between density and crowding.)

SOCvCrowding

Feeling Crowded vs. SOC Score.
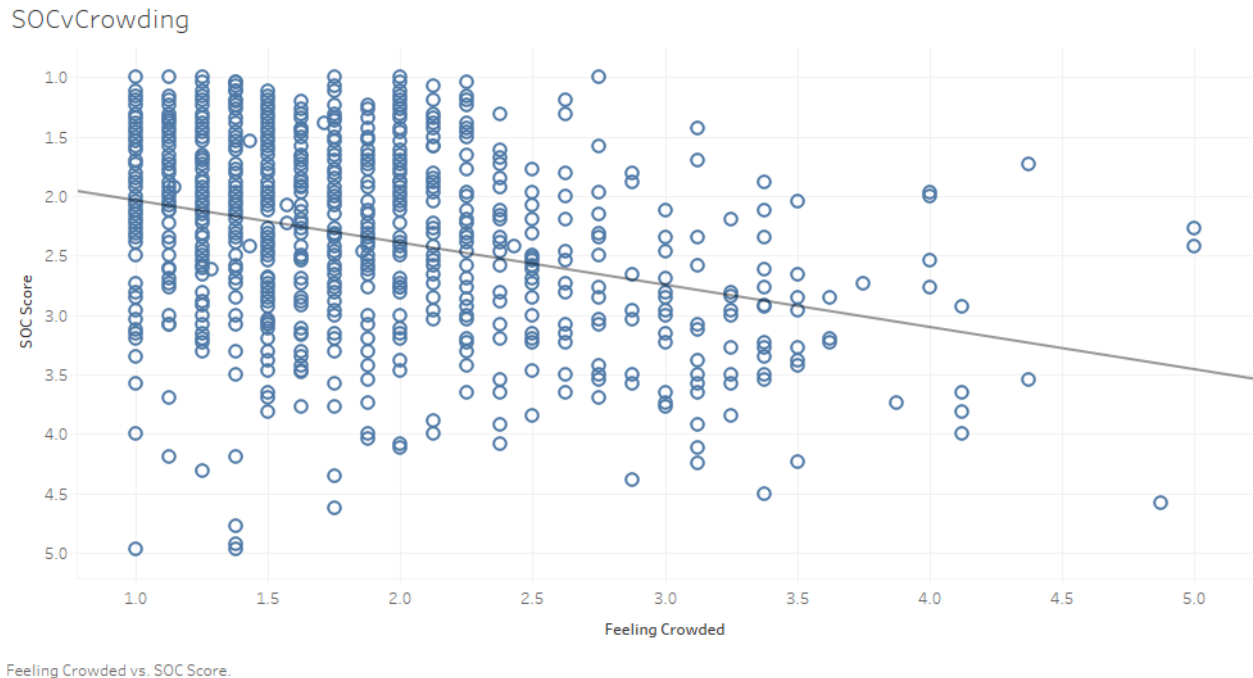
Figure 19 - Relationship between sense of community and feeling of crowding

Similar to the crowding score, I calculated a composite score for respondents' feeling of safety in their neighborhood based upon an average of several questions that I formed after a review of relevant literature. I thought safety would be an important variable for which to control, as I thought it could have a disproportionately high influence on residents' sense of community. Survey results suggest that while the relationship between feelings of safety and SOC is weak, it is positive (as one might expect), and it is stronger than most other factors measured.

SOCvSafety

Feeling Unsafe vs. SOC Score.
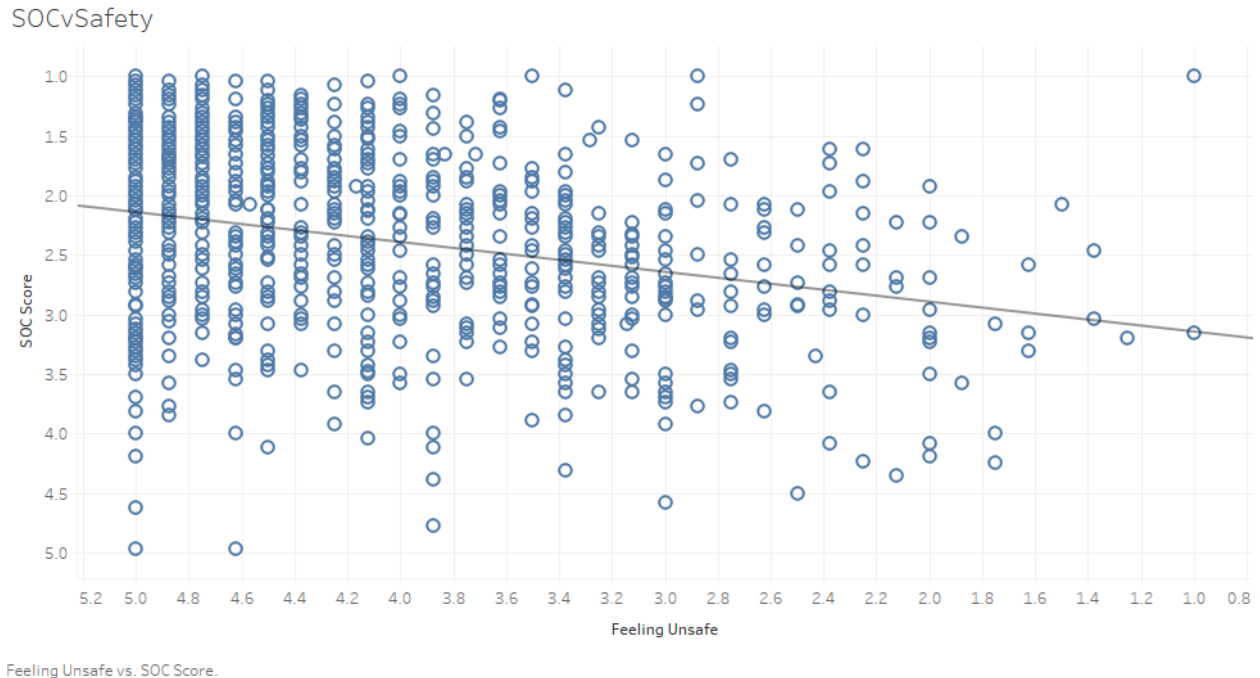
Figure 20 - Relationship between sense of community and feeling of safety

I believed this study would have been open to valid criticism if it had not made a reasonable effort to control for confounding variables. I made some effort to run multiple regressions, but with so many variables and such weak correlation coefficients, I decided it was more instructive to run the regressions separately to better show their particular values. This would still allow me to show whether any secondary independent variables might be overly influencing SOC in ways that might distort the apparent relationship between density and SOC.

It is also worth noting these secondary relationships (secondary in importance within this study) in their own right, as someone might be interested in these other relationships more than in the primary focus of the study. Since a focus of this study was to inform practice, it is worth noting variables that positively correlate with SOC, even if they do so irrespective of density. Examples are the relatively strong relationship between SOC and interaction in some local public spaces, such as walkways, parks, and grocery stores. While one might argue the direction of the causality (perhaps people with high SOC scores just tend to talk to people more, generally), and, while neighborhood planners cannot force people to interact, still, this study suggests that providing these types of public space will have a positive influence on residents' sense of community.

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Potential moderating variables

Additional to my interest in investigating the relationship between density and sense of community, and in considering potential confounding factors that might also influence sense of community, I wanted to test possible *moderating* factors that might influence the *relationship* between density and sense of community (see Figure 18). Why? Because, while I thought it was useful to understand the relationship between density and SOC, I thought it would be even more useful to understand which factors might influence this relationship. This is because density is not an easily manipulated variable. It would be very unlikely for anyone to adjust the density level of a project based on the results of this research. If I could, however, identify factors that reduce a negative density/SOC relationship or accentuate a positive one, that could be useful knowledge. For example, if the study were to show a strong negative relationship between very high density and SOC, except in cases in which residents had community center (or some other tested item), that might be useful to know. While a developer (who wished to produce a development in which future residents would have a high level of SOC) would be unlikely to move the project to a lower density area or reduce the number of units, she might consider adding a community center, if, indeed, the results suggested that this might be a measure that moderated a negative effect.

In order to test the magnitude of the effects of the variables (Figure 18) on the relationship between density and SOC, I first had to express this relationship in terms that I could measure. To do this, I calculated Z-scores for the SOC scores of each survey respondent. I also calculated Z-scores for the density of each postal code in my study area. By multiplying these two Z-scores together, I was able to create a dependent variable that represented the magnitude of the relationship between density and SOC. Then, I used a Spearman test to evaluate various factors as independent variables to evaluate the relationships between these variables and the density/SOC relationship.

As the results of these tests show (see Table 2), the correlation coefficients are very small (meaning that the influence of these items on the density/SOC relationship is very small). At first, this may seem disconcerting. After all, without some indication of what interventions may alleviate the ill effects (or accentuate the benefits) of high, low, or some other level of density, the value of the study is diminished. In any event, the lack of strength of these dependent

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variables is explained, I think, mostly by the fact that the relationship between density and SOC itself is very weak. In other words, the effects of any given intervention on mitigating the effect of density on SOC could only be small because the effect of density on SOC is small to begin with. Thus, such small effects on a small effect leave little to discuss, even though many relationships were statistically significant.

Still, a few of these mitigating relationships are of interest and subject to speculation. I was particularly interested to see whether provision of public space would positively influence the density/SOC relationship. With one exception, both use of, and interaction within, various forms of public space had a positive relationship with the density/SOC relationship, with use of cafes and local stores (grocery and non-grocery) showing a strong statistical significance. This is useful information, because, while the effect is not large, the results are significant. Also, since the dependent variables involve use of, and not just interaction within, these spaces, the results suggest that merely providing these amenities will have a beneficial influence on sense of community, irrespective of density level. Another interesting finding is that the presence of a neighborhood association seems to have a positive effect on the density/SOC relationship, while involvement with a neighborhood association seems to have a negative effect. Perhaps sometimes it's better not to know so much about one's neighbors.

Related considerations

Further to studying the direct relationship between urban density and sense of community, the relationship between potential confounding variables and sense of community, and the potential influence of moderating variables on the relationship between urban density and sense of community, I also wanted to control for other, related factors. In a sense, these could also be considered potential confounding variables, but I present them separately because I think they are further removed—tangential, but important to understand. These considerations include the potential influence of respondents' past experience, their perception of crowding, and their perceptions of how safe their neighborhoods are. I explain the reasoning for including these factors below.

Relationship between sense of community and past experience

I thought it would be important to control for survey respondents' previous experience. I imagined that if someone came from a neighborhood in which he previously had a very high or

very low sense of community relative to his sense of community in his current neighborhood, this could greatly skew the results. In fact, I wondered whether a test of neighborhood sense of community might really be a test of sense of community relative to one's former neighborhood, or relative to the type of neighborhood to which one was most accustomed. Therefore, I included several questions related to respondents' previous neighborhood experience (see Table 2). I used a Spearman test to compare the independent variables to the dependent variable, SOC score.

The results suggest that there is very little correlation between past experience and current sense of neighborhood community. While most of the results in this category were statistically significant, the strength of the associations were generally very weak. The association between feeling that one's neighborhood is safer than the previous and sense of community was notably stronger than most other associations (though still 'weak' at a correlation coefficient of 0.232). Also, questions directly related to feelings of sense of community had a high correlation to SOC score, but this doesn't tell us anything particularly interesting.

While the results of this section suggest that previous experience has very little effect on a person's current neighborhood sense of community, they also serve as a useful control to show that other results were not skewed by respondents' past experience. They also could serve as a justification for future research to leave this section out of a survey with similar objectives.

Relationship between density and crowding

As discussed in the literature review, research on the subject of crowding (a negative emotional response to unwanted social contact, generally associated with high population density environments) has shown a positive but very weak relationship with density. Since this study relied so heavily on understanding residents' emotional response to urban density, I felt it was important to test this relationship, rather than rely solely on the findings of previous studies. To do this, I included several questions related to respondents' perception of density. By comparing their responses to the density values from census data, I could compare their feelings of crowding to the level of density in their postal code. I also asked respondents to identify their housing type. This question served as a secondary test for density as a related proxy. I used a Spearman test to evaluate these relationships.

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For both of the relationships between density and crowding and between housing type and crowding, the results showed a positive but very weak association (see Figures 21 and 22). While counter-intuitive, the results are in line with previous studies, as noted above. Of interest, though, is the fit of the line in the scatterplot in Figure 18, which shows an overall average increase in feelings of crowding at very high densities. Still, there were several respondents who lived in the highest density environments in the study and had very low levels of feelings of crowding. Of course, these are likely persons who self-selected to live in these areas and brought with them a high tolerance for close living. Alternately, it may be that these high-density environments have been purposely designed to minimize negative effects of density with strategies such as noise-resistant construction. But this is only speculation and outside the scope of inquiry for this study.

The relationship between density and crowding is highly significant for this study, as I speculated that feelings of crowding would be the dominant mechanism by which density might suppress residents' sense of community in high-density environments. By showing (as other studies have done) that feelings of crowding are largely disassociated from density levels, I was able to provide a rationalization for the lack of influence of density upon SOC. In other words, if SOC is diminished by crowding (as we've seen that it is, even if 'weakly' with a correlation coefficient of -0.320), but not so much by density (correlation coefficient of -0.065), knowing that crowding is only very weakly related to density (correlation coefficient of 0.111) helps explain why this is so. This, again, is further good news for those who advocate for higher density and wish to rebut those who suggest higher densities may be linked to a lower quality of life.
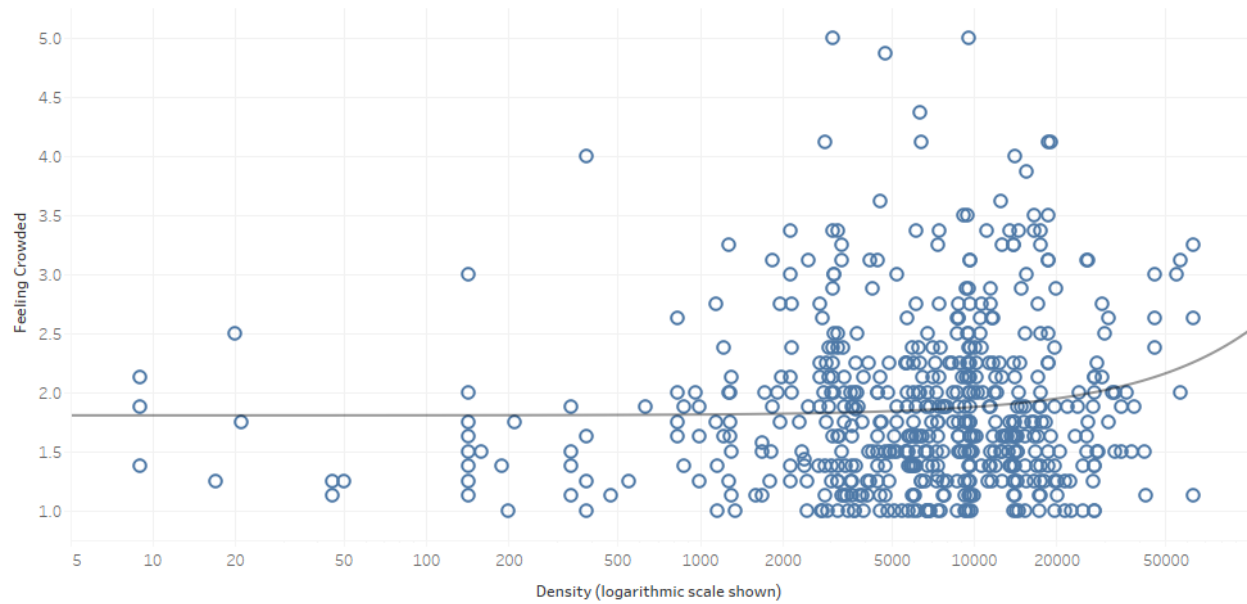
Density vs. Feeling Crowded.

Figure 21 - Relationship between density and feeling of crowding
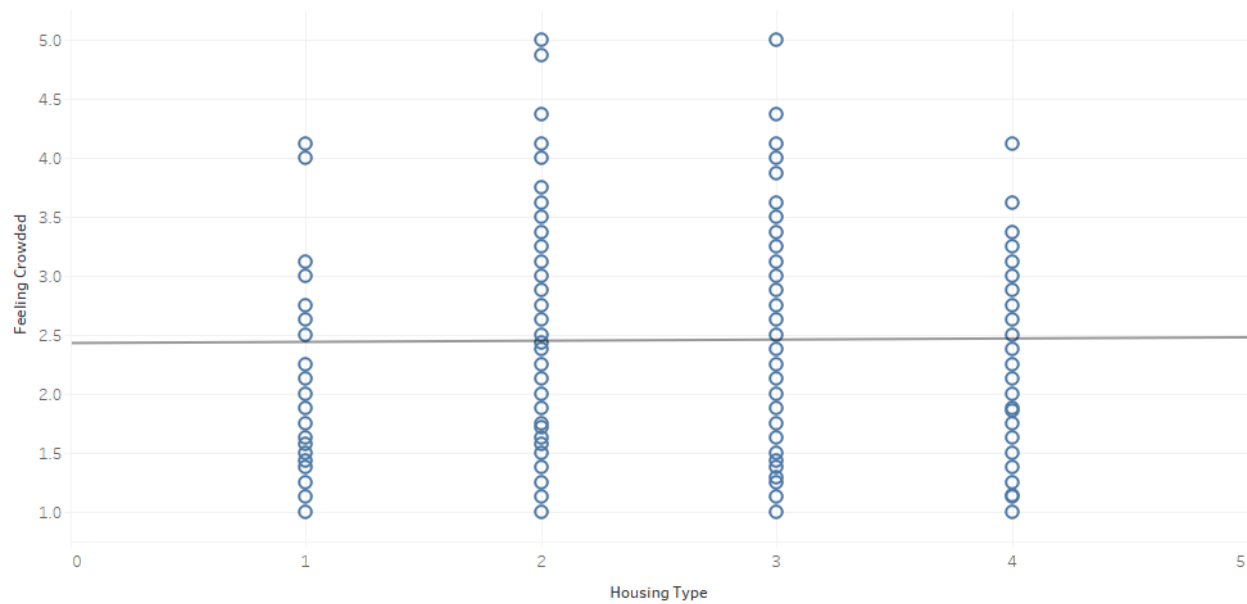
Housing Type vs. Feeling Crowded. The view is filtered on Housing Type, which ranges from 1 to 4.

Figure 22 - Relationship between feeling of crowding and type of housing

Relationship between density and safety

I believed that feelings of safety could also be a strong confounding factor in this study. How could people feel a strong sense of community in a neighborhood in which they felt unsafe? Indeed, as shown in Table 2, the relationship between safety and SOC is statistically significant and, though weak, it is stronger (correlation coefficient = 0.368) than most variables tested. But, was safety a confounding variable? Was the test of the relationship between density and SOC really a test of safety and SOC due to a high correlation between safety and density? I used a Spearman test to compare the composite safety scores to the postal code densities.

As Table 2 and Figures 23 and 24 indicate, there is an overall very weak (correlation coefficient = -0.078 and not statistically significant) relationship between density and feelings of safety. This shows that safety is not a confounding variable in this study. Also, while the relationship between density and safety, and the relationship between increasingly dense housing type and safety, are both negative, looking at the individual relationships between specific housing types and safety tells a different story, as the lower density housing types have a negative density/safety relationship, and the higher density housing types have a positive one. Again, as with the relationship between housing type and SOC, it seems that the disaggregated housing type results differ from the overall trend and, again, it seems to be the strength of the single-family house category that skews the results. In other words, respondents in the single-family house category have such a strong negative association between safety and density (correlation coefficient = -0.156) that it strongly influences the overall relationship (correlation coefficient = -0.126) more than the other categories. While this is a bit ironic, it may be that people who live in the least dense housing category are the most sensitive to perceived crime in increasingly dense environments, and they simply have nowhere less dense that they can choose to live.

DensityvSafety
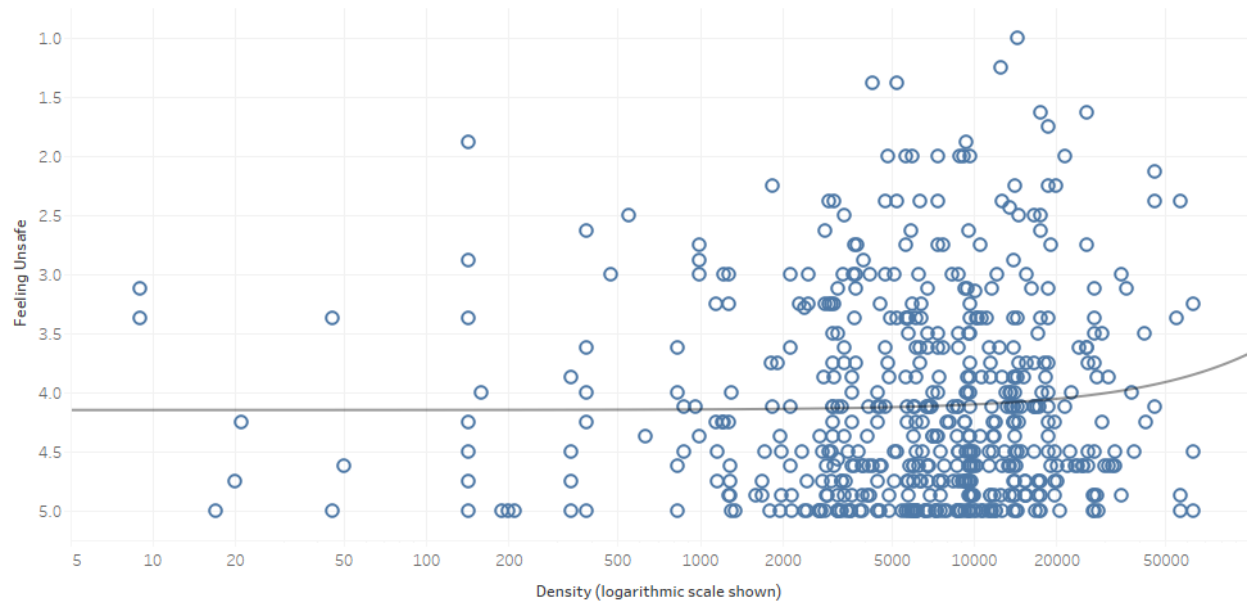
Density vs. Feeling Unsafe.

Figure 23 - Relationship between density and feeling of safety

SafetyvHousing
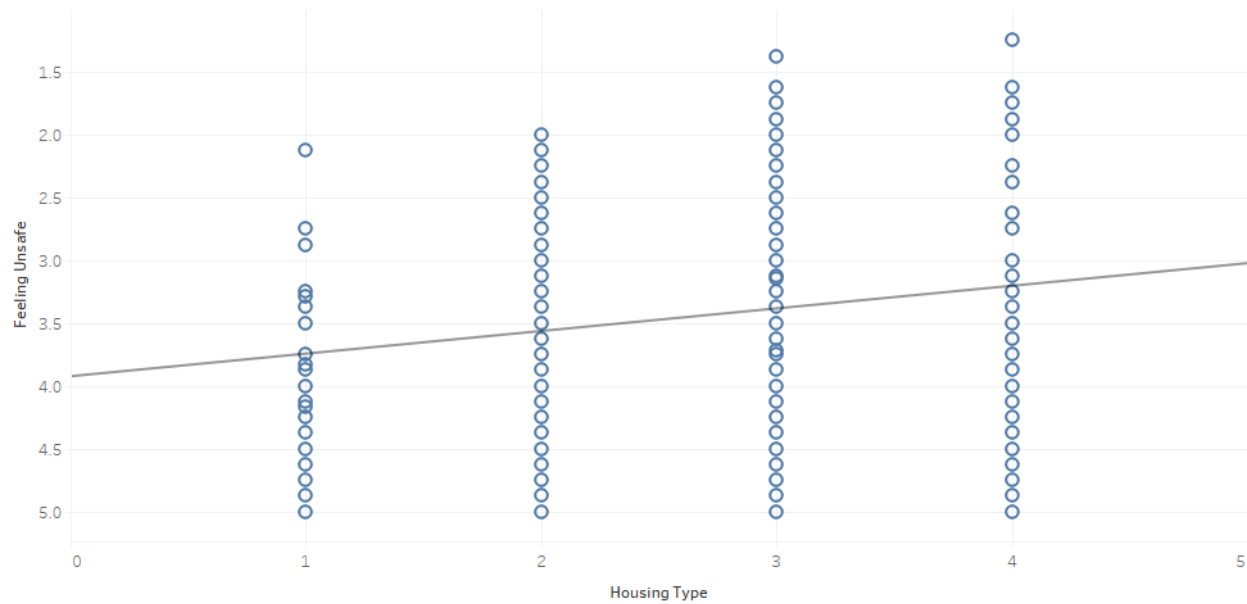
Housing Type vs. Feeling Unsafe. The view is filtered on Housing Type, which ranges from 1 to 4.

Figure 24 - Relationship between feeling of safety and housing type

Effectiveness of test items

As discussed in the introduction, methodologies for measuring both the primary independent variable for this study, density, and the primary dependent variable, sense of community, are poorly established. While the vagaries associated with density can generally be resolved by clearly defining the numerator and denominator used in its measurement, measuring sense of community still suffers from a lack of agreement among experts as to which test items are best suited. Therefore, I thought it appropriate to try to contribute to knowledge in the study's methodology rather than simply accept the most popular test for sense of community (McMillan and Chavis' Sense of Community Index (SOCI)).

As discussed in depth in Appendix A, I chose a suite of test questions that included the 12-item SOCI and a set my own 12 questions based on a survey of leading sense-of-community tests published by several researchers. I also included the statement "*It is important to me to feel a sense of community in my neighbourhood*" at the beginning of the SOC questions and the statement "*If I lost my wallet in my neighbourhood, I would probably get it back*" at the end. This made a total of 26 test items. I used the average score of these 26 items to create the SOC score for each participant. I also asked five number-based ("how many...") questions with Likert-scaled categories, but I did not include these in the SOC score.

To test the effectiveness of these 31 SOC test items, I ran three types of tests. The first was a standard measure of internal consistency for a group of test items known as the Chronbach's alpha. It is intended to show how closely related a group of test items is as a means of determining overall test validity. The Chronbach's alpha scale ranges from 0 to 1, with scores above 0.9 considered excellent. The Chronbach's alpha score for the 31-item SOC test I used was 0.965, which is substantially higher than similar tests by previous researchers.

The second statistical test I used to evaluate the test items was the Spearman test. I simply compared each test item individually against the composite SOC scores to see how well any given item would predict the overall score. The results ranged from "very strong" to "moderate," as shown in Table 3 below (Table 3 also shows the scores for test items related to safety and crowding as compared to their respective composite scores). Figure 25 shows scatterplots of the individual items compared to the composite score (steeper slopes show higher correlation).

Question number	Test: Sense of Community	SO CI	N:	Corre-lation
Q3.1_17	I feel a sense of connection with many of my neighbours.		904	0.854
Q3.1_24	I feel comfortable being around my neighbours.		902	0.808
Q3.1_19	I have neighbours I can chat with when I want to.		900	0.801
Q3.1_18	I belong in my neighbourhood.		900	0.786
Q3.1_6	I feel at home in this neighbourhood.	y	907	0.777
Q3.1_15	It's easy for me to fit in with my neighbours.		905	0.777
Q3.1_7	Many of my neighbours know me.	y	904	0.766
Q3.1_22	If I have an emergency, my neighbours will help me.		902	0.762
Q3.1_21	If I need to borrow something, I don't mind asking my neighbours for it.		903	0.752
Q3.1_16	I'm glad that I live in my neighbourhood.		905	0.748
Q3.1_20	I have friends in my neighbourhood.		905	0.729
Q3.1_5	I can recognize many of the people who live in my neighbourhood.	y	906	0.718
Q3.1_2	I think my neighbourhood is a good place for me to live.	y	908	0.711
Q3.1_4	My neighbours and I want the same things from the neighbourhood.	y	905	0.710
Q3.1_13	I would prefer to live in this neighbourhood for a long time.	y	904	0.708
Q3.1_3	People in this neighbourhood share the same values.	y	907	0.697
Q3.1_23	If my neighbours and I want to improve our neighbourhood, we can.		900	0.690
Q3.1_12	People in this neighbourhood generally get along with each other.	y	904	0.688
Q3.1_11	It is very important to me to live in this particular neighbourhood.	y	905	0.686
Q3.1_10	If there is a problem in this neighbourhood, people who live here can get it solved.	y	904	0.679
Q3.1_14	My neighbours are a lot like me.		906	0.670
Q3.1_9	I can influence what this neighbourhood is like.	y	904	0.664
Q3.1_26	If I lost my wallet in my neighbourhood, I would probably get it back.		900	0.616
Q3.2_1	How many of your neighbours do you know by name?		907	0.593
Q3.1_25	I feel comfortable walking around my neighbourhood.		903	0.571
Q3.2_3	If you had an emergency, to how many of your neighbours could turn for help?		907	0.561
Q3.2_4	How many of your neighbours do you consider friends?		907	0.545
Q3.2_2	From how many of your neighbours would you feel comfortable borrowing a cup of sugar?		907	0.537
Q3.1_1	It is important to me to feel a sense of community in my neighbourhood.		909	0.514
Q3.2_5	How many of your neighbours would you feel comfortable asking to care for your home while you were away on vacation?		906	0.505
Q3.1_8	I care about what my neighbours think of my actions.	y	907	0.480

Crowding

Q5.1_7	In your neighbourhood,... - how often do you wish you had a place in your neighbourhood where you could be alone?	863	0.814
Q5.1_3	In your neighbourhood,... - how often do you feel overwhelmed because you come into contact with too many people?	863	0.781
Q5.1_8	In your neighbourhood,... - how often do you feel you live in a crowded environment?	862	0.777
Q5.1_4	In your neighbourhood,... - how often do you come into contact with people you would rather avoid?	863	0.760
Q5.1_5	In your neighbourhood,... - how often do you go out of your way to avoid interacting with your neighbours?	862	0.753
Q5.1_2	In your neighbourhood,... - how often do you feel annoyed, bothered, or disturbed by the noise or activity of your neighbours?	864	0.701
Q5.1_6	In your neighbourhood,... - how often do you feel angry because people in your neighbourhood don't leave you alone?	862	0.657
Q5.1_1	In your neighbourhood,... - how often do you feel you do not have enough privacy?	863	0.619

Safety

Q6.1_7	I worry about my personal safety in this neighbourhood.	863	0.871
Q6.1_1	My neighbourhood is not safe.	864	0.820
Q6.1_8	I think I would feel safer if I moved to a different neighbourhood.	860	0.792
Q6.1_2	My building is not safe.	854	0.786
Q6.1_3	I am afraid to walk in my neighbourhood at night.	861	0.768
Q6.1_6	I worry about my personal property being damaged or stolen in this neighbourhood.	861	0.753
Q6.1_4	I am afraid that I could be attacked or harmed in my building.	856	0.750
Q6.1_5	I think parents should not feel comfortable letting their young children play in this neighbourhood with minimal supervision.	858	0.659

Table 3 - Effectiveness of various test items by Spearman test.

All correlations are positive with p < 0.001. Items are listed in decreasing order of strength (within categories), with correlation coefficient strengths considered 'very weak' below 0.2, 'weak' between 0.2 and 0.4, 'moderate' between 0.4 and 0.6. 'strong' between 0.6 and 0.8, and 'very strong' over 0.8. Items that are part of the Sense of Community Index test (SOCI) are noted.
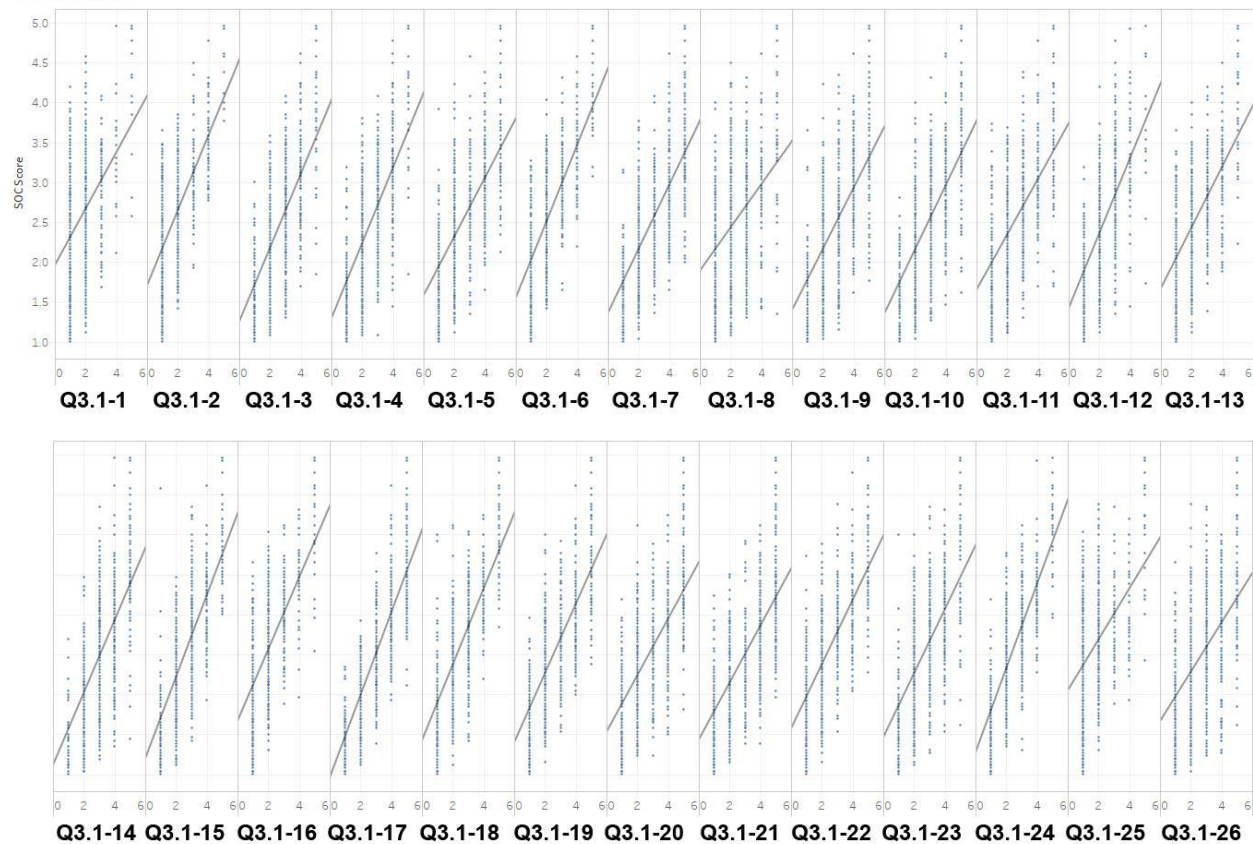
Figure 25 - Effectiveness of sense of community test items

Finally, I ran a regression model to determine how much predictive power successive questions added in determining the overall score. As shown in Table 4, question 3.1_17 ("I feel a sense of connection with many of my neighbours.") is listed first, as it is the best predictor, able to predict about 75% of the change of the overall score (as shown in the "R Square change" column). Question 3.1_6 ("I feel at home in this neighbourhood."), although ranking fifth best predictor per the Spearman tests, was the second most predictive question after 3.1_17 in the regression model, adding another roughly 10% of predictive power. Likely, questions ranked higher than 3.1_6 by Spearman had less cumulative predictive power because they were more similar to 3.1_17 than 3.1_6 was. As Table 4 suggests, additional questions add very little predictive power beyond the 85% given by 3.1_17 and 3.1_6. So, a future survey might do well to just use those two items. As Table 3 shows, question 3.1_6 was an SOCI test item and 3.1_17 was introduced in this study.

SOC Test Items Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
					Change Statistics				
1	.865[a]	.749	.748	.39737	**.749**	938.649	1	315	.000
2	.923[b]	.852	.851	.30582	**.103**	217.828	1	314	.000
3	.944[c]	.891	.890	.26198	**.040**	114.886	1	313	.000
4	.954[d]	.910	.909	.23893	**.019**	64.318	1	312	.000
5	.963[e]	.928	.927	.21376	**.018**	78.792	1	311	.000
6	.968[f]	.936	.935	.20201	**.008**	38.227	1	310	.000

a. Predictors: (Constant), Q3.17

b. Predictors: (Constant), Q3.17, Q3.6

c. Predictors: (Constant), Q3.17, Q3.6, Q3.24

d. Predictors: (Constant), Q3.17, Q3.6, Q3.24, Q3.19

e. Predictors: (Constant), Q3.17, Q3.6, Q3.24, Q3.19, Q3.13

f. Predictors: (Constant), Q3.17, Q3.6, Q3.24, Q3.19, Q3.13, Q3.1

Table 4 - Results of regression model of SOC test items showing predictive power of successive items

I also ran the first two tests for the eight test items I used to generate the score for "crowding" and the eight items used for the score for "safety" (see Table 3 and Figures 26 and 27). The Chronbach's alpha for the crowding items was 0.871 and the score for safety was 0.898, both "very good" scores (and close to excellent). This was heartening, as these tests were less carefully crafted that the one for SOC. In fact, Spearman testing showed that all items for these tests were either "strong" or "very strong."

CrowdingvCrowdingitems
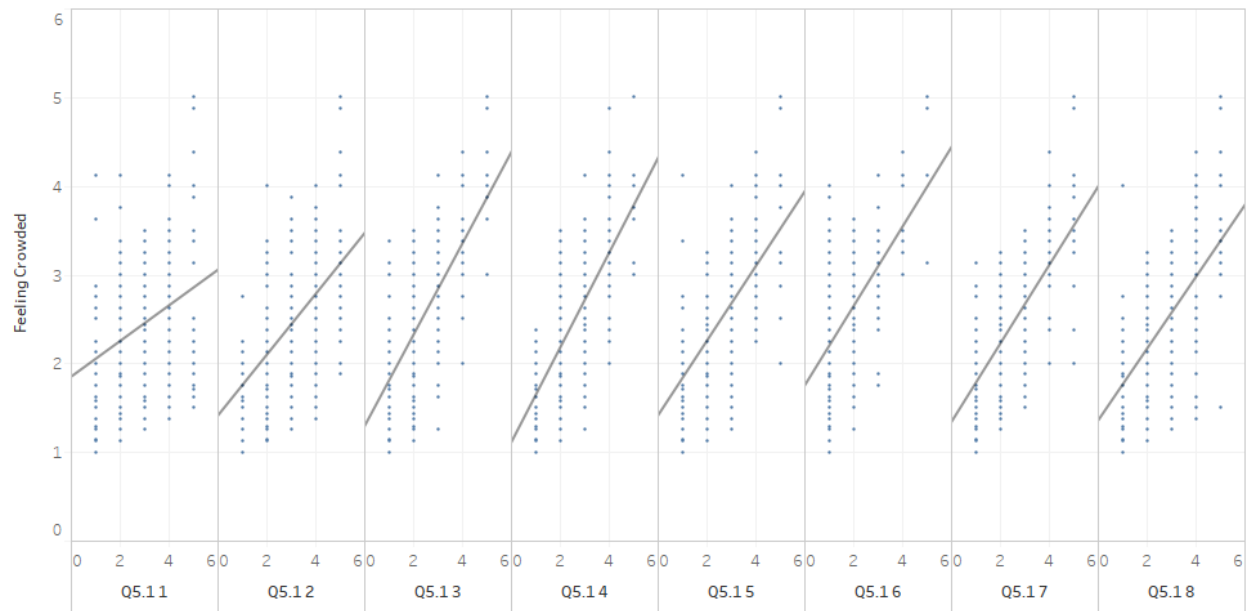
Q5.11, Q5.12, Q5.13, Q5.14, Q5.15, Q5.16, Q5.17 and Q5.18 vs. Feeling Crowded.

Figure 26 - Effectiveness of feeling of crowding test items

SafetyvSafetyitems
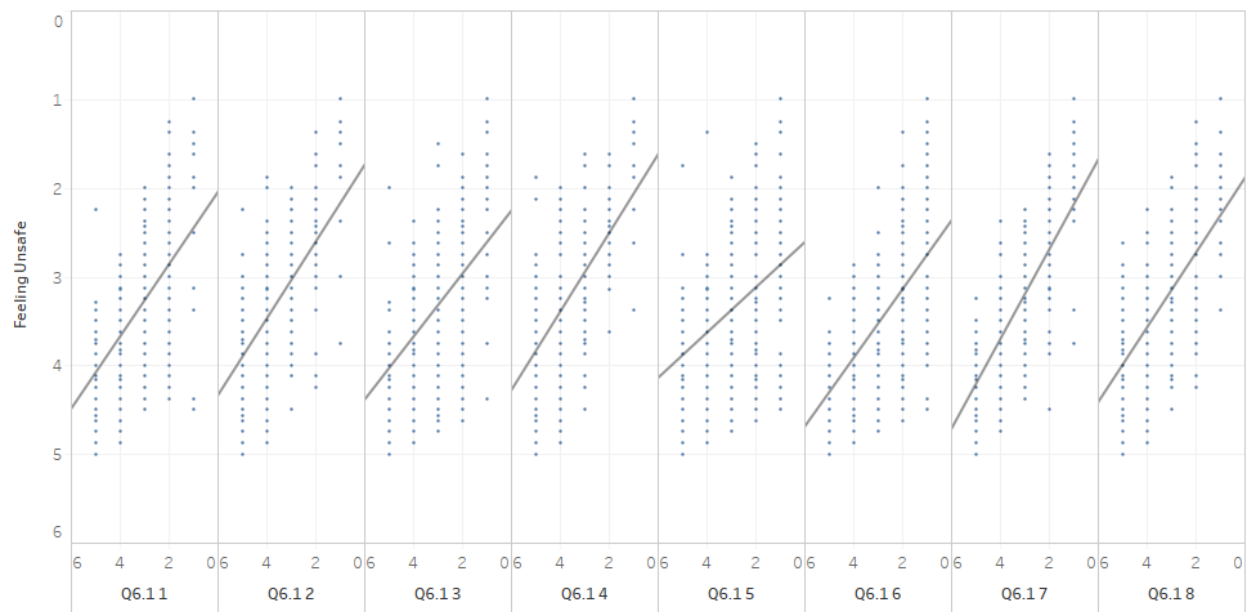
Q6.11, Q6.12, Q6.13, Q6.14, Q6.15, Q6.16, Q6.17 and Q6.18 vs. Feeling Unsafe.

Figure 27 - Effectiveness of feeling of safety test items

The results of these methodological tests are significant. First, the Chronbach alpha scores lend a high level of credibility to the study and make a strong recommendation for these tests to be used in future studies. Second, they suggest that the leading test for SOC is not as

effective as the test items used here. In fact, none of the SOCI test items scored in the top four places and none scored "very strong." On the other hand, three of the test items that I created had "very strong" scores. Finally, these results suggest that a similar future survey could be just as effective with far fewer test items. One could test for sense of community, feelings of crowding, and feelings of safety with only two or three questions each. This could greatly reduce the time needed to complete such a survey and potentially lead to a higher completion rate without substantially degrading the quality of individual results.

Chapter 5: Gaining a deeper understanding of residents' sense of community through semi-structured interviews

I felt that in order to adequately address the question of the relationship between density and sense of community, it would be best to use a mixed-methods approach. I thought it would be necessary to conduct an online survey to achieve an adequate breadth of information, and use a sub-set of this survey for in-person interviews to gain a deeper understanding of the issues involved. From the pool of survey respondents, I had 15 persons from my geographic areas of interest volunteer to be interviewed in person. From these semi-structured interviews, I was able to gain insights that would have been prohibitive to glean from the survey responses alone. (See appendices 'G' and 'H' for summaries of interviewees' responses.)

Perceptions of terms

One of the issues I wanted to discuss in interview format was how the survey respondents/interviewees understood some of the terms I used. Examples of such terms were "neighborhood," "sense of community," and "public space." I could have done extensive research to discuss definitions for all of these terms as they are understood by academic researchers, but this would not tell me what was in the minds of my survey respondents as they took the survey. Also, I thought asking survey respondents to define these terms in the survey would have made the survey prohibitively arduous, especially as it was already quite long. Thus, I saw the in-person interviews as an opportunity to gain insight into what they, and, by extension, possibly other respondents were thinking as they took the survey. Questions that addressed interviewees' perception of terms included the following:

- *What do you consider to be your neighbourhood?*
- *What do you think it means to have a sense of community?*
- *What are the public/common spaces in your neighbourhood?*

I consider these next.

What do you consider to be your neighbourhood?

One word that I decided early on would be very difficult (and useless) to define is "neighborhood." What is a neighborhood? What is *your* neighborhood? From a practical standpoint, the definition can only be subjective. Whatever your neighborhood is for you is up to

you to define. This is why the first question of my interview asked interviewees to define their neighborhood.

Most responses to this question defined boundaries in some way, often including several city blocks. Some responses approached the definition in other ways. Nick (all names are aliases) defined his neighborhood as the people who live around him. Ineth also thinks of her neighborhood primarily as person-based, including her own building and the neighbors who live on either side of her. Dee thinks of her neighborhood as anywhere she can reach quickly by foot, bike, or bus. Similarly, Liz considers her neighborhood to be the area within walking distance of her home. Lou and Whohan both live in the Klahanie neighborhood of Port Moody, British Columbia, but Lou considers her neighborhood to include all of Central Port Moody and Whohan considers only Moody Centre (a much smaller area) to be her neighborhood. The interviewees seemed to substantiate the intuition that, while neighborhoods can have generally-accepted boundaries, there is no way to know what any individual considers her neighborhood to be without asking her.

What do you think it means to have a sense of community?

Another subjective phrase is "sense of community." While it is the core concept of the study, and while I offer substantial digression on the term in the introduction, it is anybody's guess what it means to a survey participant until one can ask him. In fact, even a simple request for a definition may evoke only a tautology rather than a meaningful working definition. I hoped the dialogic nature of a semi-structured interview would allow opportunities to draw out what interviewees were thinking of when they filled out the survey (with the hope, of course, of finding themes that could justify some extrapolation and generalization).

Several words were used by multiple interviewees, such as variants of 'belong,' 'connect,' 'safe,' and 'familiar.' Hearing these descriptors helps triangulate the wording of the test items and verify that the survey questions are indeed representative of what people tend to associate with the phrase 'sense of community.' They also support my intuition that people would closely associate safety with sense of community.

Each interviewee had his or her own take on the meaning of sense of community, but the definitions tended to form a close pattern. Nick thought of SOC as 'a group of people residing together as a team.' Dee talked about having a sense of place, feeling safe, and having 'not quite a sense of ownership, but not wanting to see a place vandalized.' Seedsaver also spoke about a

sense of place, safety, familiarity, and belonging. Lyla focused primarily on safety for both her and her children. Kathy talked about belonging, familiarity, being comfortable, and having things in common with neighbors. Amelia mentioned a willingness to speak up and join a community. Claudia talked of belonging and connection. Marie said, "it means to feel connected with the people...in your community, and feeling a sense of belonging and a sense of ownership." Helen thinks it means "knowing the people that live around you and being involved." Olivia associates SOC with being "happy going back home," being able to greet neighbors, and feeling safe. Liz thinks of sense of community in terms of being able to stop and have conversations with people in her neighborhood. Grace discussed feelings of belonging and inclusion. Lou brought up safety and whether there are "people here that care whether you exist" and if she could "stop with a neighbor on the street and have a chat." Ineth simply related it to 'people who share her values.' And, Whohan thinks SOC means "to be engaged and feel like I'm contributing to the community's spirit and growth and that the community is contributing to my growth."

What are the public/common spaces in your neighbourhood?

The third term I asked interviewees to discuss was "public space." Again, I believe this is a subjective term that people often take for granted. I wanted to know what my interviewees envisioned as they spoke about the nature and quality of the public spaces in their neighborhoods. I summarize their responses here:

Nick:	a *small park, a reading room, a social room, and a gym*
Dee:	*two local streets that are closed to auto traffic*
Seedsaver:	*Jim Davis Square Mall, a community garden, Nelson Park, the English Bay and Cole Harbor sea walls, Stanley Park, the mini park on Butte, and the mini park on Cardero*
Lyla:	*the sidewalks, the shops, the community center, the forest, the farm, the hallways and the building lobby*
Kathy:	*Strip parks, Wesbrook Community Centre*
Amelia:	*roundabouts, sidewalks*
Claudia:	"Everything but the houses"
Marie:	*Old Barn Community Centre*
Helen:	*park with playground; 'Doggie Lane;' field with BBQ area and horseshoe pit area; indoor recreation area with spa, pool, lounge, library, ping-pong table, gym, and woodworking shop*
Olivia:	*community center with community room and gym, coffee shop*
Liz:	*several parks, including a children's park with a swing and a sandbox; pool*
Grace:	*coffee shop, children's playground, condominium amenity rooms, community center, city park*
Lou:	*green space; community center with gym, movie room, dance room, lounge, pool, hot tub; city park; coffee shop*
Ineth:	*community center, building courtyard, green space (used by people with dogs), playground, creekside walkway with benches*
Whohan:	*coffee shops, street plaza, city park, 'Brewers' Row'*

Table 5 - Places that Interviewees considered 'public space' in their neighborhoods

These responses validate, for the most part, the types of spaces I chose to test in the survey, namely,

- A building common space (lobby, corridor, elevator, etc.),
- A walkway,
- A park,
- A playground,
- A community center,
- A café,
- A grocery store, and
- A store other than groceries.

A few interviewees also mentioned gym space, and that would likely have been useful to include as an option in the survey. My favorite response was Claudia's: "*Everything but the houses*."

The survey also offered opportunities for people to suggest public spaces other than those listed above. The survey asked both about which public spaces interviewees *used* and in which public spaces they *interacted with others*. In the "other" category for public space *use*, interviewees suggested several alternatives to the ones given, including the following:

Places for buying goods, such as

- art shop
- convenience store
- corner store
- drug store
- farmers market
- gas station
- mall

Places for buying services, such as

- banks
- bar
- barber
- drycleaners
- hair salon
- health services
- hospital/doctor/other medical
- local breweries
- pub *(several respondents)*
- restaurant *(several respondents)*
- walk-in clinic

Places for recreation or activities, such as

- beach
- community garden
- gardens
- fitness
- gym
- laundry area
- library *(several respondents)*
- live theatre venue

- pool
- recreation centre
- soccer field
- tennis Club

- YMCA
- yoga studio *(several respondents)*
- mailboxes; property gates

Places for gathering, such as

- church
- each other's homes for book club meetings
- local cemetery *(!)*
- school

- seniors friendship society
- UBC
- volunteer facility
- courtyard

Places for moving around, such as

- bike lane
- bus stops
- Langley Airport
- Skytrain

- "The road! All our kids play on the road daily and the neighbours visit."
- transit
- trails

As for the "other" public spaces in which people claimed to *interact*, the list includes the following:

Places for buying goods, such as

- drug store
- farmers market
- mall
- marrijuanna store *(sic)*
- bakery
- gas station

Places for buying services, such as

- breweries
- movies
- pub *(several respondents)*
- hair salon

Places for recreation or activities, such as

- community garden
- gardens
- gym *(several respondents)*
- laundry room
- pool *(several respondents)*

- tennis courts
- yoga studio
- library *(several respondents)*
- mail boxes; property gates

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Places for gathering, such as

- AGM
- backyard
- church
- common outdoor space
- courtyard
- each other's homes for book club meetings

- front yard or street
- HOA annual meeting
- preschool
- school
- seniors friendship society
- Wechat

Places for moving around, such as

- on the street *(several respondents)*
- sidewalk
- Skytrain

- trails
- transit
- transit stop

Based on the above two lists, additional response options that a future survey might offer include "gym," "library," "pool," "pub," "restaurant," and "yoga studio." A review of both the "other" categories of the survey and the responses of the interviewees offer several ideas for researchers as to what people consider to be public space and which public spaces may be more amenable to personal interaction.

Perceptions of neighborhoods

A central purpose of the interviews was to understand how interviewees viewed their neighborhoods and how these views connected to their sense of neighborhood community. To gain this understanding, I used the following questions:

- *How would you describe your sense of community in your neighbourhood?*
- *What do you like about your neighbourhood?*
- *If you could change anything about your neighbourhood, what would it be?*
- *Do you wish you spent more time or less time speaking with your neighbours?*
- *Do you consider your neighbourhood to be very dense?*
  - *Is it crowded?*
  - *Would you rather live in a less dense neighbourhood?*
- *Tell me about how safe your neighbourhood is.*
  - *What would make it safer?*

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I will discuss the responses I received to these questions in this section. I also asked questions related to improving public space, and I will discuss the responses to those questions in a following section.

How would you describe your sense of community in your neighbourhood?

In addition to how interviewees described the concept of sense of community as they understood it, I asked them to describe their own sense of community in their neighborhood. My purpose in asking this question was to calibrate interviewees SOC scores from the survey to their self description of their level of SOC. Interestingly, it mostly failed in that task. In retrospect, I think I never really figured out how to ask the question properly. I still don't know and I think there may be no way to ask it. How can someone self assess the degree to which she experiences sense of community? What could someone possibly use as a baseline? I think what I was hoping for was a description that I could use as a basis for comparing the responses to each other to see if they validated the SOC scores. In this respect, I think the answers are useful. Also, I think the responses to this question were more informative due to the interviewees queuing in to the word "describe" and providing fairly freeform answers in response. This serendipity was possible due to the semi-structured format of the interviews, as I could help guide the interviewees to make the most of the question. Still, in the spirit of my initial intent for the question, I provide the SOC scores along with the interviewees responses below. (Note that the possible SOC scores range from 1 to 5, with 1 being the highest and mean score being 2.28 for all survey respondents. The range for interviewees was 1.31 (at 1.25 standard deviations above the mean) to 3.15 (1.12 standard deviations below the mean)). Here are summaries of their responses listed in decreasing order of SOC score (lower numbers represent a higher score due to the way I coded the questions):

Claudia (SOC score = 1.31)	"I do feel truly connected and I do feel part of the community. I do think that we are building this community and this neighborhood with the people that are here. It's a dynamic community and sometimes I miss people that leave but then I'm always happy to connect with new neighbors and welcome them to the neighborhood."
Ineth (SOC score = 1.31)	"That we respect each other's privacy, that we aren't noisy."
Liz (SOC score = 1.38)	"One of the reasons...we chose our complex was because...there were kids playing outside, or there were obvious signs that kids were just playing outside. So, helmets and bikes all over the place....There was enough room for cars to drive by, but also

	sort of a space in front of each of the units. So, there would be... it seemed every third or fourth house had a hockey net, and garages were open, and bikes were just thrown on the ground. It seemed like a 'lived in' place. It seemed like a place where kids could run out the door and find a bunch of friends and play in the neighborhood."
Helen (SOC score = 1.42)	"I can remember growing up, when my parents would have two or three tables set up in the living room and have other couples come over and play cards for an evening. That doesn't happen anymore. So I think that the sense of community is declining as people go their own way and there's so many things out there happening that everybody's got other things to do."
Marie (SOC score = 1.42)	"I feel very connected to my community, and I think one of the big factors in that for myself is that I actually was one of the first people to move into this neighborhood when it first started, the very first building that went in for staff and faculty. We were one of the first families to move in, so we saw the whole neighborhood grow up around us. I do feel a deep ownership to what's going on in the neighborhood, and I know a lot of the people who have lived here for a while."
Lyla (SOC score = 1.46)	"I have a strong sense of community. I love where I live. I love my home. I love the amenities near my home...the shops, the community center, the forest."
Grace (SOC score = 1.50)	"My sense of community here is that people help each other. Like on Saturday, we had a Klahanie garage sale, and although I wasn't volunteering at it, I went down there. I must have seen five, six people that I knew. You just leave feeling really good, because you had a cup of coffee with them, and you see everything from pregnant moms all the way up to elderly seniors that are there, all sort of knowing each other."
Lou (SOC score = 1.54)	"I feel at home here for sure and it's a comfortable environment. It's a safe environment. There's lots of people that I've met who have similar sort of outtakes on life."
Whohan (SOC score = 1.77)	Whohan likes her neighborhood and feels engaged in her neighborhood, but feels that her sense of community "struggles" for lack of a strong community association and lack of a good meeting venue.
Dee (SOC score = 1.92)	Dee's sense of community in her neighborhood is colored by her role as a property manager, which leaves her "engaged with a certain amount of reservation."
Olivia (SOC score = 2.04)	"Trying to interact and meeting as many people as possible in the neighborhood, that's kind of our sense of community. Relative to the earlier neighborhoods, I would say it's very strong here."
Seedsaver (SOC score = 2.04)	"I feel a sense of belonging--a familiarity with my neighborhood, where places are like public buildings, schools, churches, community garden, public spaces. I don't feel so much of a sense of community with the new buildings that have replaced the former old buildings that were three or four story walk up buildings. Now we have these new very large condo towers, and I feel we no longer has eyes on this street. It's more alienated because you don't know the people that live in those buildings."
median of all 910 survey respondents (SOC score = 2.28)	
Nick (SOC score = 2.31)	Nick expresses his sense of community by volunteering and being helpful and active in his neighborhood.
Amelia (SOC score = 2.35)	Amelia loves her neighborhood and knows many of her neighbors, but doesn't like living in a strata arrangement.
Kathy (SOC score = 3.15)	Kathy feels isolated in her high-rise but has found an online queer woman Facebook group in which to find company.

Table 6 - How interviewees describe their sense of community

Not only is it challenging to try to place these responses on a spectrum (which might allow us to validate the SOC scores based on the responses), it is also difficult to parse any specific patterns that help us quantitatively differentiate the interviewees' sense of community in their neighborhood. Clearly, Claudia is highly engaged with her neighborhood and Kathy is lonely, but how can we distinguish those who are half a standard deviation above the mean (like Dee) from those who are a full deviation above (like Marie)? So, while instructive, it is difficult to generalize the information in these responses.

What do you like about your neighbourhood?

I asked the interviewees what they liked about their neighborhoods. The answers tended to relate to both people and places, but usually emphasized one more than the other. People-related themes included 'events,' 'kids,' 'diversity,' and 'human potential.' Place-related themes included 'walking,' 'transit,' 'nature,' and 'public spaces.'

Within the people-related themes, Nick was the only interviewee that referenced organized events and activities for this question. The interest in 'kids' was obviously higher among those that had them. "I like that kids can just run outside and find someone to play with--they're comfortable here," noted Liz. "They have a bit of independence, where I don't always have to be with them. They can create their own adventures without me or my husband, which is important, I think, for them. And it's also nice for us, too, because we can just sit at home and we know they're safe. They'll be okay. We don't have to constantly be with them." Marie likes that they live on a dead-end street that children use to play hockey, and Olivia just likes hearing kids playing nearby. Several interviewees mentioned the value of cultural diversity, including Dee, Seedsaver, and Claudia. Whohan focused more on her hope for the future. "What I really, really like about Moody Center is the potential of Moody Center. I really, really like that that there is so much potential for real positive change in Moody Center through the range--social, economic, development--the full range. Like it's really just sitting there...ready for changes to happen that can have positive impact."

Even more relevant to this study were the comments related to the natural and built environment. Dee, Lyla and Ineth all spoke in favor of the walkability of their neighborhoods. "We can walk everywhere....This is what was so appealing when we moved here," said Ineth. "I can walk to my dentist, my eye doctor, my...GP,...the bank,...the grocery store,...the library. I can walk to--I have a choice between two gyms. And I can walk out my door, and I can go across the

street, and I'm at the ocean." Related to walking is transit. Lou noted that the local Skytrain station is a "huge advantage" for her. The most often mentioned neighborhood feature, by far (Kathy, Amelia, Claudia, Helen, Olivia, Lou, and Ineth), was access to nature. Ineth proclaimed, "I could never live anywhere I didn't have immediate access into a park or some kind of nature....I can walk or ride my bike, and in half an hour I'm in the middle of the woods and there's nobody around. And I don't think I could ... I would never want to move away from here." Finally, public space was also mentioned, though not as effusively as access to nature. Claudia likes to have access to playgrounds, Lou likes having access to a local park, and Marie is happy to live in a neighborhood with a community center, a coffee shop, a playground, and a community garden.

If you could change anything about your neighbourhood, what would it be?

I intended this question to be a counterpoint to the previous question. The replies tended to coalesce around four topics, namely, reduce incivilities, improve spaces, improve communication, and reduce density.

Nick was bothered by the bicycle theft in his neighborhood (and, in fact, in his own building, which very much disturbed him), and wanted see it reduced. Lyla was frustrated by the litter and dog poop in her neighborhood, and saw these as representative of a lack of community responsibility. Lou would like to have fewer dogs in general, being bothered by both their defecation and their barking. Dee, on the other hand, wished that city laws curtailing dogs in public would be relaxed to allow more people to socialize and train their pets. She noted that in Germany, dogs were highly integrated into public spaces and were very well behaved. Several interviewees spoke out against the traffic in their neighborhoods, wishing it could be reduced or eliminated. In fact eliminating traffic was advocated by both Marie and Liz, who would like to see car-free pedestrian zones in their neighborhoods. Olivia would like to have more social spaces, like coffee shops, and Kathy would like more grocery shopping options. Interestingly, though they both live next to a large national forest, Kathy and Amelia feel they have a lack of park space.

Several interviewees referred to improving communication, such as Seedsaver who wanted to improve connections among diverse populations in the community, Helen who was frustrated by the lack of communication among the local stratas in her area, and Claudia who

was frustrated both by a lack of communication from her landlord (Student Housing and Hospitality Services at the University of British Columbia) and by the lack of an arbitration process for tenants who experienced conflicts. Finally, density was an issue for many. While Whohan and Seedsaver expressed a desire for more diversity (arguably, a function of greater density), Seedsaver, Kathy, and Ineth all expressed a distaste for density, high-rise buildings, or both.

Do you wish you spent more time or less time speaking with your neighbours?

Most people said they wished they spent more time speaking with their neighbors, but some were content with the amount they spent. I realized after a few interviews that I should have first asked them how much time they spent speaking with their neighbors, as a point of reference. The intent of the question was to try to gauge whether interviewees desired more neighborhood interaction than they had, and to consider how this might relate to their sense of neighborhood community. For example, did people with a high sense of community desire more contact, or were they content with the amount they had? Ultimately, there seemed to be no connection, as the answers at both the high and low ends of the SOC scores had similar mixes of responses.

Do you consider your neighbourhood to be very dense?

Is it crowded?

Would you rather live in a less dense neighbourhood?

All of my interviewees live in high-density neighborhoods. That was a pre-requisite for selecting their neighborhoods to study (as noted in the Methodology section). But, I wanted to know if they experienced their neighborhoods this way. I also wanted to know if they considered their neighborhoods to be crowded (a negative reaction to density) and if they would rather live elsewhere because of this density. As shown in Table 7, many interviewees did not consider their neighborhoods to be dense, and only one, Kathy (who seemed to have other discontents with her neighborhood) felt her neighborhood was crowded. Only two interviewees would prefer to live in a less dense neighborhood. For the purposes of this study, ideal responses were given by those who believed that their neighborhoods were dense but not crowded, as

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finding ways to make neighborhoods 'dense but not crowded' is one of the prime objectives of the study.

Name	very dense?	crowded?	rather live in a less dense neighbourhood?
Nick	no	no	no
Dee	yes	no	no
Seedsaver	yes	no	no
Lyla	'medium density'	no	no
Kathy	yes	yes	yes
Amelia	yes	no	no
Claudia	yes	no	no
Marie	'moderately dense'	no	no
Helen	no	no	no
Olivia	no	no	no
Liz	yes	no	yes
Grace	no	no	no
Lou	yes	no	no
Ineth	no	no	no
Whohan	no	no	no

Table 7 - Whether interviewees consider their neighborhoods to be dense/crowded

Tell me about how safe your neighbourhood is.

What would make it safer?

Another subjective assessment I wanted to get from my interviewees regarding their neighborhoods related to safety. I did not include crime statistics in my data acquisition, but I did want to hear from the interviewees how safe they thought their neighborhoods are and what they would recommend to improve safety. Their responses are shown in Table 8 below. Though some responses relate to built environment interventions (cameras, lighting), most suggest institutional (social services, mediation, police) or behavioral (block watch, shops open later) changes.

Name	neighborhood safe?	what would make neighborhood safer?
Nick	yes	install cameras
Dee	yes	better social services in the downtown east side
Seedsaver	yes	fewer vacant storefronts
Lyla	no	better lighting in the park and better road safety for pedestrians
Kathy	yes	better social services for people with drug and housing issues
Amelia	no	provide a block watch program
Claudia	no	provide a neighborhood mediation program to address conflicts
Marie	yes	keep shops open later to encourage more people to be out later
Helen	yes	provide more police foot patrols
Olivia	yes	keep the raccoons from getting into the garbage

Liz	yes	reduce theft
Grace	no	reduce traffic
Lou	yes	(no suggestions)
Ineth	yes	(no suggestions)
Whohan	yes	'more people'

Table 8 - How interviewees would improve the safety of their neighborhoods

Perceptions of connections

Going into this study, I expected that participants' sense of neighborhood community might be influenced by many factors that were largely unrelated to their neighborhood. For example, I imagined that there could be significant cultural differences that might influence a person's interest in community engagement. On the other hand, a person might not be at all representative of her culture. A person might be a very withdrawn member of a gregarious culture. Or, the deviance may be the reverse. In any event, someone's SOC score might have little or nothing to do with her physical environment and everything to do with her culture (or reaction against it).

Another consideration was what external (outside of neighborhood) connections participants had. My expectation was that stronger connections outside of the neighborhood would correlate with weaker sense of neighborhood community. Results from Table 2 show that this is generally the case, though the strength of the correlation is very weak. I thought it really could have gone either way. One theory could be that people who have many or strong connections outside of their neighborhoods would be the kind of people (by nature) who would have strong connections within the neighborhood. However, I believed a stronger theory would predict the opposite, namely that people who satisfied their needs for community (and used their time) outside of their neighborhood (with family, church, hobby group, etc.) would have less motive to satisfy this need within the neighborhood. The interviews were a forum to explore these theories and the results from the survey, though, of course, the interview results may not easily transfer to other persons or groups.

In the survey, I asked respondents to list the ethnicity with which they identified and their first language. I considered processing this data to compare average SOC scores according to ethnicity and language. While this data could have provided additional insights into respondents' feelings of belonging or acceptance in their neighborhoods, I had ethical concerns about presenting data linking SOC scores to these variables without proper context, so I did not

analyze this relationship. There were some questions that I thought would be useful prior to running the survey that I later considered to have little application.

On the other hand, in the interviews, I asked the interviewees' about their culture and connections and did try to process that information. I see this as different from the ethnicity/language questions of the survey because the former could more easily be seen as attempting to characterize an ethnicity, possibly unfavorably, while the latter is more an attempt to understand personal, but significant, influences on an individual, considering important components of her lived experience.

Table 9 below shows the culture with which the interviewees identified and how, in their opinions, that culture tends to view sense of community. A question I would have added to this sequence is something like 'Is there any way in which your sense of community differs from that of the culture you identify with?' Again, the point of this line of questioning was to see if interviewees' culture might have an outsized influence on their sense of community that might overwhelm any influence exerted by their built environment.

Name	Culture	How culture views sense of community
Nick	(passed)	(Nick was upset that people didn't recycle their waste products properly, but I wasn't sure if he was referring more to people in his neighborhood or to people he considered to be in his culture.)
Dee	Black community	"In a very defensive way. And partly because the lost of Hogan's Alley, and I'm aware of the community that's fighting to bring that back. There are people whose families lost their homes when they took down the buildings--so they have that visceral connection to what was once a black community and now isn't. It's very defensive, especially in Vancouver because we have to actively seek each other out. Yeah. So you either have to go online, find Facebook groups, because there's a Facebook group called 'Meanwhile Black in Vancouver' and that actually has been fantastic for me. I was down to literally two black friends in Vancouver, and it's not that I have the social fantasy to interact with everybody else, but I need my sisters. And I was actually like, 'god, do I have to move to Toronto? How am I going to do this?' But no, I was able to reconnect. So yeah, it's not a passive thing at all. We have to seek each other out."
Seedsaver	Canadian	"I guess with the West End, they're welcoming to that...probably because of the variety of businesses and the diversity of people."
Lyla	Canadian	"I think there's a high sense of, like, maintaining space. The flip side of that is that my husband's perspective and I've sort of noticed it too now is that he finds Vancouver people pretty standoffish--that he feels like people, when he says hello to people, they don't...people won't engage with him. So yeah, Vancouver is not...we are not as nice as the Canadian stereotype--the American stereotype of Canadians. We are not as nice as that stereotype made him think we were going to be."
Kathy	Queer woman, Jewish	"It's the absolute heart and core of queer women's lives, to kind of be together because of the history of homophobia and everyday experience. It's uncomfortable being around straight people sometimes, it's even threatening sometimes, like if

		you walk down the street holding a woman's hand you'll be harassed by a lot of men, chances are. Or boys, or young men especially, are the worst. So, in reaction, I think women work to create bonds and community, and what that has to do with is mostly trying to support each other--be there for each other--see people through problems--treat people kindly....Lesbians are really famous for staying friends after they break up with each other, and there's a reason for that. When you're in a limited community and you're going to be in it all your life, there's a great motive to try to be the best person you can."
Amelia	Caucasian	"I think they really value it and they're at a loss as to its demise."
Claudia	Latin	"If it's a funeral or a marriage,...you know we got it. We always got it."
Marie	Canadian	"I think that it's fairly highly valued."
Helen	Canadian	"I think we're pretty good. You know, as much as people denigrate the Trudeau name, one thing that his father did was encourage the multi-culturalism. And I think... that's one of the things that bothers me about community. People talk about the Indo-Canadian community and the Japanese-Canadian community, and--I'm sorry--I don't believe in hyphenated communities. It separates us into them and us, and that creates problems. Take a look at the states and what's happening down there--when you've got the 'them and us.' When you start separating and compartmentalizing communities, then it separates rather than integrates. And we worked so hard on multi-culturalism to make everybody feel valued as Canadians that we then separate again by, you know, Muslim-Canadians and Indo-Canadians and French-Canadians and Polish-Canadians? We have Japanese, Korean, Filipino, we have a refugee family, we have Hungarian, we have several Russian families. We pretty much cover the globe."
Olivia	Middle Eastern	In Turkey, for example, people sometimes, like elderly people, or people who have seen Istanbul in those times that it was not so populated, they go like, 'We had nice neighborhoods. People would know each other, everybody would trust each other.' So people value in this culture as well this sense of community, feeling safe and knowing that the shop owner downstairs is looking after you and so on. But it doesn't happen now, especially in big cities. It's not there. Maybe in a little building, like building-wise, maybe, but not ... I haven't experienced it."
Liz	Euro-Canadian	"It's not great. I think we're very... we tend to be a bit individualistic and in my experience, people can put up a lot of walls about 'Oh, everything is fine. It's great. I'm so busy!' But really things could be really difficult and it's hard to know that. And I think people are...maybe I'll change that Euro to British, because I think maybe it's a British thing, because my husband is French and he's definitely not like that."
Grace	'middle class prairies'	(passed)
Lou	Canadian	"I think we used to value it more and I would like to think that some of the younger people are coming around to it again. I think in many cases it skipped a generation."
Ineth	environment alists and dog people	"I wonder if they're not looking at it for the same way I am, where they look at it through an environmental lens."
Whohan	Canadian white	"Canadian white community is very insular."

Table 9 – Culture with which interviewee identifies and how interviewee thinks that culture values sense of community

The majority of my interviewees identified primarily as some variant of white Canadian. On the whole, they seemed to think this culture does value sense of community, but tends to be "stand-offish," "individualistic," and "insular"—all qualities that hamper developing a sense of community. Dee and Kathy both gave particularly insightful responses in terms of the influence their self-identified culture had on their sense of neighborhood community. Dee identified with the "Black community" as her culture and Kathy with 'queer Jewish women' as hers. In each case, the cultural with which they identify is a minority with few, if any, other members within their neighborhoods. Particularly for Kathy, this has played a significant part in her alienation in her neighborhood and her desire to move to a neighborhood ('Commercial Drive') that is more amenable to her lifestyle. Likely, very little in the way of public space or amenities would change that for her.

We see similar patterns when we look at the communities to which interviewees felt connected. There was some overlap, of course, between the responses to the question of which culture the interviewees identified with and question of the communities to which they felt connected. As I explained during the interviews, the first was related to identity and the latter dealt with active interpersonal connections. In several interviews, interviewees didn't seem comfortable giving an answer for the second question. Results are shown in Table 10 below.

Name	Communities to which interviewee feels connected	How interviewee ranks importance of communities
Nick	"I think all new immigrants, because I believe that we have similar problems or we came across similar situation things, yes. So sometimes we can share our feelings and also we can give other persons some suggestions and some piece of advice."	"I think they're all the same importance to me."
Dee	"I feel very connected to the black community here....I also have the arts community here....I've also been heavily involved in toastmasters for over 10 years."	(Didn't record a reply to this question)
Seedsaver	"Well, I guess arts groups, maybe. And my partner and I, where we have an allotment garden, so the people that we garden with....The other thing we do is we go to the Y, so the groups of people that ... yeah, at the YMCA."	"Probably, maybe, the Y. Then, maybe, we also volunteer at the Neighborhood House, so maybe that might be number two. Because that would be people that live within the community, so that's two. And probably the gardens, and then arts things that we might go to."
Lyla	"The professors on campus, the young families on campus."	"Assistant professors, women in engineering, women in science, young families, the mother/parent community, board gaming community and then my extended family."

Kathy	"my UBC colleagues in the English Department,...online community for female-identified queers,...Jewish Community Center."	1. Work associates 2. Women friends 3. Fellow Vancouverites
Amelia	"the UBC community"	(Didn't record a reply to this question)
Claudia	"The Persian community,...the Latin community,...and...the LGTBQ community."	"The Latin community within Acadia Park."
Marie	"A lot of our communities are really because of what our children are doing, and this has basically been from day one, I would say. So, currently, there's a hockey community outside of the neighborhood, but there is some overlap in the neighborhood as well....We know a lot of people who live in our former building, and are very good friends with one family there."	(Didn't record a reply to this question)
Helen	"I still associate with some of the scouting friends that I made when I was living in Kamloops....But no, the only other group that I associate with on a regular basis is my family group."	(Didn't record a reply to this question)
Olivia	"Acadia Park, one of them. UBC in general, like the business school that I study in."	"UBC, Acadia Park, Sauder (the business school)."
Liz	"My neighborhood, my physical neighborhood. I have a few online communities that are pretty important to me. And I have a group of women that I first met when we first became moms that is also pretty important."	"Probably, the women that I met online. They actually live in this area, so that's how we happened to meet....Those are my people....Then probably the neighborhood."
Grace	"So probably the Port Moody gym as well as my workplace....Oh, the Port Moody Curling Club."	"Okay, so I have the Friday Morning Walking group that I started here....Lets rank that one second....The first one I'm going to tell you about right now. I would say that doesn't have a name, but it's a group of friends of mine that I met at the gym, but it's not about the gym.... So we've gone to classes and hikes and stuff like that for almost 10 years, and now we've come to know each other and we hang out together."
Lou	"Okay, we're involved in the musical community here. That's a big part of it. We're members of the art center, there are other people in this community who are doing volunteer work that I'm involved in. So that whole volunteer community as well, foodie things are a big deal in the bigger community especially. So like Rib Fest or Food Truck Fest or that kind of thing. Loosely, the Community Association Group because we have a little bit of involvement with them. I think that's pretty much all in our local community."	"Probably the art center."
Ineth	"I feel most connected to my condominium and my three neighbors....That's my most important little neighborhood, and then comes ...And I'd say the dog and the environmentalist (groups) are on even footing....They're tied for second. And then people my age and which I relate to far better to than young people, except those people who are environmentalists, or if they have a dog."	(as noted in first question)

Whohan	"Well, clearly the heritage and the arts communities, since I'm on boards for them."	(Didn't record a reply to this question)

Table 10 – Communities to which interviewee feels connected an how interviewee ranks the importance of these connections.

My intent with these questions was to try to understand which social groups were competing with their neighborhoods for my interviewees' attention. As noted above, I speculated that people with several active connections outside of their neighborhoods would have less incentive to find connection within their neighborhood. Some interviewees prioritized groups within their neighborhood and others groups outside. It was difficult to use the responses to answer the question of how much external groups displace the interviewees' sense of neighborhood community or how to apply the insights that are available. I'm also unsure of how better to pursue this issue or how relevant it is.

Recommendations for public space

A fundamental goal of this study was to learn about the influence of public space on residents' sense of community, especially in high-density environments. To do this, I included questions related to public space in both the survey and the interviews. I also performed site observations based on my findings in the interviews.

Table 8 below shows results from the survey related to respondents' use of public spaces in their neighborhoods and how often they interacted with their neighbors in these public spaces. A goal of these questions was to find quantitative patterns suggesting which public spaces might be more amenable to enhancing sense of community. To make this suggestion, a type of public space would have to be, first of all, used at all, and, second, used for interaction, with the latter given more weight. The bigger question this line of testing sought to inform was, 'what kind of public space should I choose for a new development if my goal is to create a neighborhood with a high sense of community?' I had hoped the data would provide some clarity to this question.

Looking at the data, however, the answer is not entirely clear. Some spaces, for example are not optional. A building is going to have a lobby. A neighborhood is going to have walkways. But there are still choices to be made. A building can have a minimal lobby or one that facilitates interaction and walkways can be minimal or gracious, stark or lined with amenities. Then there are several optional spaces that a neighborhood may or may not have at all. As we see below, all of the spaces listed were used on a daily basis and all provided venues for interaction. If we consider the relative percentages of people who interacted with neighbors

at least weekly in each of these spaces, we get the following list in decreasing order of frequency:

- walkway: 54% (35% weekly + 19% daily)
- lobby: 48% (26% weekly + 22% daily)
- park: 29% (22% weekly + 7% daily)
- grocery store: 25% (21% weekly + 4% daily)
- café: 19% (16% weekly + 3% daily)
- community center: 18% (16% weekly + 2% daily)
- non-grocery store: 17% (15% weekly + 2% daily)
- playground: 15% (11% weekly + 3% daily)
- other: 6% (4% weekly + 2% daily)

At first, I was surprised by these results. Going into the study, I would have expected playgrounds and community centers to rank much higher, based on my own experience. However, based just on these results, a developer interested in providing public space *for the purpose of building sense of community* would do better to provide a park or a grocery store than a playground or a community center. It is also noteworthy that the other category ranked so far below the next lowest ranked category. This suggests that the suite of spaces I included in my survey was appropriate.

Use of public space		Never	Annually	Monthly	Weekly	Daily
A building common space	Count	272	44	55	75	411
	% of total	30%	5%	6%	8%	45%
A walkway	Count	65	16	44	161	584
	% of total	7%	2%	5%	18%	64%
A park	Count	123	50	176	338	187
	% of total	14%	5%	19%	37%	21%
A playground	Count	448	90	114	146	60
	% of total	49%	10%	13%	16%	7%
A community center	Count	286	154	196	198	34
	% of total	31%	17%	22%	22%	4%
A cafe	Count	175	60	240	330	58
	% of total	19%	7%	26%	36%	6%
A grocery store	Count	92	10	62	575	127
	% of total	10%	1%	7%	63%	14%
A non-grocery store	Count	99	33	265	418	48
	% of total	11%	4%	29%	46%	5%
Other	Count	44	5	39	58	27
	% of total	5%	1%	4%	6%	3%

Interaction in public space		Never	Annually	Monthly	Weekly	Daily
A building common space	Count	268	33	100	236	199
	% of total	29%	4%	11%	26%	22%
A walkway	Count	181	39	140	320	177
	% of total	20%	4%	15%	35%	19%
A park	Count	335	83	155	204	68
	% of total	37%	9%	17%	22%	7%
A playground	Count	533	55	113	103	31
	% of total	59%	6%	12%	11%	3%
A community center	Count	434	104	142	145	22
	% of total	48%	11%	16%	16%	2%
A cafe	Count	404	79	185	145	29
	% of total	44%	9%	20%	16%	3%
A grocery store	Count	371	81	169	192	34
	% of total	41%	9%	19%	21%	4%
A non-grocery store	Count	411	94	167	134	21
	% of total	45%	10%	18%	15%	2%
Other	Count	95	10	13	39	19
	% of total	10%	1%	1%	4%	2%

Table 11 - Survey respondents' use of public space and interaction in public space

While the data in Table 11 is informative, I thought it would be important to get a deeper understanding of how people used these spaces and why. While I could quantify how frequently people spoke to their neighbors in various spaces (Table 8), and even the strength of correlation with SOC scores (Table 1), it would still be a matter of speculation *why* these correlations existed. I could only speak to the qualitative nature of how these interactions related to residents' sense of community by engaging in dialog. Also, my survey data did not distinguish any qualitative aspects of the various categories (all parks counted as parks—I didn't distinguish "good" ones from "bad" ones). This is why I included the following series of questions in my interviews:

- *What are the public/common spaces in your neighbourhood?*
  - *How do you use them?*
  - *Do you speak with your neighbours in these spaces? If so, when?*
    - *What types of things do you usually discuss?*
    - *Have you become more familiar with your neighbours this way? Why?*
  - *If you could change something about the public spaces in your neighbourhood, what would it be?*

- *Think of a perfect public space for your neighbourhood—describe what it would be like.*
  - *How is the public space in your neighbourhood different from the one you just described?*

I have already discussed the first question in the section related to perception of terms. I'll discuss the other questions next.

First, how do the interviewees use the public spaces in their neighborhoods? Their responses can be categorized by activity and by location. (The question was about *how*, but the responses, by nature, included locations.) Activities included:

- reading,
- walking,
- commuting,
- children's activities,
- associating with friends,
- recreation,
- entertaining,

- connecting,
- biking,
- business meetings,
- exercise,
- meeting people, znd
- dog walking.

Locations included:

- reading room,
- gym,
- park,
- seawall,
- beach,
- shops,
- restaurants,
- coffee shops,

- community garden,
- wooded area,
- woodworking shop,
- community room,
- playgrounds,
- sauna, and
- pool.

As we can see, this list is similar to the items shown in the survey, but includes many other locations as well, as did the list of "other" public spaces generated by the survey. But how many of these spaces were useful a venues for interaction? Here are the locations mentioned by respondents in answer to the question, "*Do you speak with your neighbours in these spaces? If so, when?*":

- park,
- gym,
- beach,
- elevator,
- playgrounds,
- water park,

- coffee shop,
- sidewalk,
- shared parking garage,
- pool,
- lounge area,
- farmers market.

So, we can see that most of the spaces used by the interviewees are also places in which they interact with their neighbors. In fact, a few new spaces are mentioned in this list that weren't mentioned in the former.

I also wanted to know what sorts of things the interviewees discussed. Were these superficial conversations as one might have with a proprietor—pleasant conversations that would never lead to a substantive relationship—or were these interactions that built sense of community by leading to progressively trusting and meaningful relationships? I asked interviewees about the substance of their conversations to try to answer this question. It seems, predictably, that there was a range of topics from the very light, as with a first encounter, to the more substantive and serious, as one might have with a trusted friend. Topics included (in a roughly increasing level of familiarity):

- weather,
- 'get to know you' type questions as one might ask of a new aquaintance,
- kids/dogs,
- life/health,
- event/activities, and
- issues, such as
  - neighborhood/community concerns
  - shopping/financial matters, and
  - strata-related topics

It seemed that the interviewees enjoyed a full range of discussion topics in the public realm. As one might expect, the nature of the topics would change based on the familiarity of the parties.

Still, the big 'So what?' question was whether any of this interaction really influenced interviewees' sense of community. To speak to this matter, I asked them whether they believed

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these encounters helped them get to know their neighbors better (as a more relatable proxy question for 'did this increase your sense of neighborhood community?'). With one exception (Kathy), all adamantly agreed that it did. The following quotes help to illustrate this:

Seedsaver:	*"Because you engage in conversation with them. **There's a familiarity from seeing them and then from talking to them in different places**."*
Marie:	*"Definitely, yeah. Especially when it's a spontaneous interaction, or somebody's just walking past and you might comment on something. I think even very small events like that can help you to get to know someone a little better. We had new neighbors move in next door to us just last year, and I remember one of my first interactions after meeting them was they noticed that we had put blueberry bushes in at the end of our patio, and they immediately commented on that and said, 'Oh, that's a great idea. We're going to do the same thing.' So, that very short interaction gave me a strong sense of one thing that they valued in terms of having something that they could eat on their patio, which...was something in common....So, **even the very small interactions, I think, can help you to get to know what people are like and finding common ground**."*
Helen:	*"Oh absolutely....**I never would have known that this particular woman was involved in community theater if I hadn't sat down and chatted with her** and asked her, 'What have you been up to?'"*
Olivia:	*"Because...these events...there's food... people are ready to talk, so we just meet, and we start talking....In the beginning, it's a bit surface. But then if you realize, this person is really fun to talk to, or if you realize there's some connection, you have some common things to talk about, then you start talking more. Then you exchange contacts, and then **the friendship kind of starts to carry on apart from the event**."*
Liz:	*"Yeah, absolutely....I think it's because **it's sort of neutral territory that you can get to know somebody**. It can be sometimes difficult to invite somebody into your home right away. Or to expect an invitation to somebody else's home. So these sort of neutral, but common spaces - I think common is a better word - it's easier to have conversation."*
Grace:	*"Oh, for sure, because they're sharing their problems with you, and you're helping them, or they're helping you with theirs. So that's human interaction....You might see someone on the Klahanie Facebook page who has some strong opinion about some goofy thing. Then I immediately think, 'Oh, I'm not going to like that person. I think she's pro this or anti that.' Then **if you meet them here and you see them face-to-face and you have a conversation about something else, there's more depth to it**."*
Lou:	*"Well, my husband's a musician, so he plays in farmer's markets and things like that. So you interact in other spaces and you get to know the people through other spaces and then they come to our house. So then it's within our home, but then you've already had that introduction. **The public spaces here make that an easier transition**, right? I don't invite strangers into my house. Not Too often anyway."*
Whohan:	*"Because I think that, maybe because people tend to walk the same places all the time. And so there are people who I have run into more than once now. So, it's not just a hello, it's, 'I remember, I talked to this person,' or, they go, 'I saw that person,' like it becomes more of a bit of a connection every time you run into somebody that you've seen someplace before.... J is a perfect example of this. She's really good. We are diametrically opposed on many, many, many, many things--many things, but we also connect on some certain things. So we'd never met, outside of some conversations on Facebook. Crossed her on a trail, said hello because we sort of knew each other but we'd never met, but our faces were familiar....We're both very, very active in the community. And so that hello built to more of a conversation and then the next time it strengthened the conversation and the next time we managed to have a private conversation **that really shifted the foundation of a fairly antagonistic relationship to something that's not at all antagonistic**. So it really did start, though, from a recognition of who that person was and just a simple hello."*

The take-home point from this series of questions is that, at least for this group of interviewees, public spaces have been important venues in the formation of acquaintances and friendships. I believe their comments demonstrate the importance of public space in the development of residents' sense of neighborhood community. Of course, this is not true of just any public space. An abandoned field full of garbage is probably not an ideal setting for developing meaningful friendships and trusting relationships. The next series of questions asked interviewees to discuss the quality of the public space in their neighborhoods and to consider how it might be better.

Interviewees had several ideas for improving their public space. Some suggested adding new features, such as information kiosks, dog parks, places to discuss governance, picnic tables, or a community tea or coffee bar. Others suggested increasing existing amenities, such as sheltered public space, grocery stores, places to sit, bike racks, community garden space, retail stores, mobility accessible spaces, coffee shops, and play spaces for children of various ages. When interviewees spoke about their ideal public spaces, they mentioned items such as the following:

- games,
- tables,
- chairs,
- semi-public spaces,
- flea markets,
- coffee shops,
- places for square dancing,
- a communal tea wagon,
- a mix of play areas for big and little kids,
- a large gathering area for large events,
- 'magnificent' public space at the edge of nature and urbanity, such as Columbus Circle in New York City,
- spaces that combine several features, such as a playground, a water park, pergolas, and game tables,
- walkable neighborhoods with piazzas,
- accessible areas with activities for kids, adults, and dogs, and
- lots of trees.

Generally, greenery, play areas, and coffee/tea areas featured prominently in the interviewees' list of desires for public spaces. These comments provide more depth of understanding to the results of the survey and can provide guidance to urban designers seeking to provide, not just more public space, but better public space that is amenable to fostering a sense of community.

Chapter 6: The role of public space in maintaining a sense of community in high-density neighborhoods

In chapter 4, we examined the relationships between sense of community and several independent variables. In chapter 5, we sought to understand these relationships in context and in detail. Here, in chapter 6, we take an even deeper look into the processes and mechanisms by which sense of community may be formed. In pursuit of our argument for causality, we look for clues that directly link sense of community to the nature and use of the built environment. We do so by considering several poignant exchanges that took place during the interviews. These exchanges cover several themes, including, how public space might be appropriated from auto space and used for social interaction, how interaction in public space has led to friendships, and under what circumstances people who otherwise dislike density would be willing to live in higher density environments. I present these exchanges here unabridged for context.

Appropriating automobile space to facilitate social interaction

This first exchange, with Marie (whose sense of community score was 1.10 standard deviations above the survey average (SOC = +1.10SD)), involves a creative use of what would not usually be considered public space. An explicit object of this study was to understand how public space can provide opportunities for positive social interaction. I approached the study with, I think, fairly conventional ideas of what public space is, but I also tried to probe for instances of unconventional or adaptive uses of space for socializing. In this instance, the space in the discussion was so unusual as a public space, it took a while for the interviewee to realize that this is how it was used. As the conversation develops, she further realizes that this borrowed space was actually fundamental to her experience as a resident.

> *Eric: The idea is 'what are the spaces? Do you use them? If you use them, do you see neighbors there and speak to neighbors?' That's the progression.*

Marie: Okay, okay. Yeah, so actually probably one of the more common places I randomly run into people is when I'm walking through the neighborhood to get to the grocery store. I will run into people who are also doing the same thing, or maybe they just happened to be out walking somewhere else. That's probably the most common place I would run into my neighbors. Other places are actually ... Oh, this is one I didn't mention. It's sort of a common space in our building. We have a common garage, so that is actually one place where I very frequently will

see my neighbors and talk to them.

Eric: Can you describe this garage?

Marie: Our building has 10 town homes in it, so the garage is just a common straight line garage.

Eric: Underground?

Marie: Underground. So, that's one route to go out to empty the garbage, so we might run into people who are doing the same thing down there. It also has become a play space for kids, and it's one of the best things about our building. Kids from other buildings will try to come in to play as well because it's a slight slope of concrete and it's just straight, so it's perfect for little kids for biking, for skateboarding, hockey. Again, we have a hockey net in there so when it's raining outside, kids will shoot pucks in the garage.

Eric: They can play in the garage, which is covered.

Marie: Yes, and it's truly one of the best things about our building to have that space.

Eric: Cars must park there.

Marie: Yeah, the cars park there but they're all in one line, so there's this other strip that's open with a wall against it.

Eric: Is it like this?

Marie: Basically like that, yeah. There's a hockey net at the end here, so people will shoot pucks down to the hockey net or even shoot against the wall.

Eric: And, do people who park here complain?

Marie: Nope. Nobody's ever complained. There's never been any issue.

Eric: Are these usually full of cars?

Marie: Yeah.

Eric: But, there's a strip, the access way?

Marie: Yeah, the access way that's just open.

Eric: The kids can play there because it's covered.

Marie: Yeah, and it's safe. It's enclosed.

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Eric: This is one of the best places in the building?

Marie: Yeah, I would say so. It's been so well used. We've lived there 16 years now, and there's always been, I would say out of the 10 units, at least four or maybe five families who had kids who played hockey, so literally there'd be hockey games going on down there. Other kids who were more into soccer would go down there and kick the soccer ball around.

Eric: So, they had an outdoor controlled space.

Marie: Exactly, and my son would make skateboard jumps and stuff. There was all kinds of stuff happening down there. It was similar to having that open back lane but it was covered. Yeah, it's interesting that I had forgotten about that and wasn't thinking of it as a public space, but for our building, it certainly was.

Eric: It sounds like some of your best memories are your children playing in re-occupied spaces that were designed for vehicles.

Marie: Yeah, that's actually true. Yep, and that's where we have had the most interaction with our neighbors, I would say.

Eric: In those spaces?

Marie: Yeah, yeah, and going back to the back lane building, it grew to a point where the families that are there now, still they'll have common barbecues where just everybody will come together. It may or may not be planned but they might drag tables out or whatever and have a little block party. Or, just spontaneously, if people are out in the evening, they'll start sharing a bottle of wine or something like that. I really strongly feel that the way that it is structured back there is conducive to building connections between people, and I've never lived in a place that was quite like that. The closest thing is Acadia Park, which in some ways has some similar features with the lack of traffic and a space that's open for people. Kids can play and connect together.

Eric: How would you compare those two places? Do you see that alleyway that you had functioning similar to the way the walkways do in Acadia Park?

Marie: I think it does, but when I was at Acadia Park, it was just when my daughter was a baby. We moved when she was six months old here, so I didn't quite have the direct experience, but I saw, and still see what's happening with the way kids are playing right outside. It feels like a safe spot where they can just go and play unsupervised, and you get a sense that they feel like they could go to their neighbors if they needed help with something. Maybe I'm reading a little more into that, but I do think that that type of structure with the housing plays a really big role in how people are able to feel like part of a community.

I really enjoyed that story. No urban designer would have predicted that that space would be used for recreation and engagement. In fact, I imagine that most property owners, if they

found out how it was being used, would put up signs prohibiting the behavior (signs that would be ignored). Here is an excellent example of re-purposed space, taken from cars and appropriated for humans.

Grace (SOC = +1.00SD) had a similar idea. Urban designers may think they are being creative and adventurous when they suggest closing streets and giving them to pedestrians, but it's not such a radical notion. Grace did not strike me as a trouble maker, but she did propose an ambitious idea for her neighborhood--one that would take courage to advocate and to implement. The idea of closing a major thoroughfare may seem jarring, but her reasoning is sound. This is what she suggested.

Grace: I would have more playgrounds, because we just basically have one tiny... It's almost like a tot lot. We've got lots of young families living here, and I think playgrounds are what bring everybody together. Then I was thinking about that when I was walking over here. I thought it's almost like we need an adult play space as well. The adult play space is here at Divano's, but wouldn't it be great to have a little community park with a no smoking sign, or it would become, like most of these condos around here have gone non-smoking. So what happens is whenever there's a little space, the smokers go there. We don't have tons of smokers, but they will go there.
So if you had some kind of a space, like imagine this here, where people could go and there might be chairs and tables, and there isn't really any place like that. There's a green space right down by the canoe club, but it's a big flat piece of lawn that everyone's taken over for the dogs to use. So you're not going to go sit there, but maybe even some adult recreation. Like when I was overseas, you'd go to a park, and there'd be pétanque or Bocce or horseshoes and things like that right in the middle of the park. There's all the adults. Sometimes it would be young adults and sometimes it would be seniors just playing.

Eric: Where would you put that?

Grace: Oh, I got an idea. So you know this Ring Road right here, so it hasn't been too busy right now, but during rush hour, it can get a little busy and people cut in here, speed through here, and come back out to try to cut their commute down. A ton of cars come flying through Port Moody from East in order to get downtown. So you could actually chop Klahanie in half, this big Klahanie Ring Road here, and you could build a space like I've seen in downtown Vancouver. I'm sure what happened at some point, neighbors got together and lobbied the city of Vancouver and said, "You need to calm the traffic here."
They build these... I don't know if you've seen them. You're an architect, right? So maybe you know what I'm talking about. They're like big things, but they have plants in them and trees, but they don't have chairs and things to do. But you could actually stop the traffic, because there's no need for cars to come in and around here like that.

Eric: Just cut the road in half?

Grace: Cut the road in half, put a park there, put some adult games, some chairs that are bolted down or whatever....And somewhere that the teenagers can go too, because where are the teenagers supposed to go? Somewhere they can hang out other than trying to hide, because they can't go to the playground. Nobody wants them there anymore. They don't want to hang out... Teenagers that live around here don't have basements like when I grew up in Calgary. All the kids were sent to the basement, right? Better go get away from the adults. So you could do that. Some place that was just for... It wouldn't say adults only. The only rule would be no smoking. Other than that, this is your space. Come here, hang out.

Vancouver already has experimented with the idea of converting auto space into pedestrian/public space. For example, when I interviewed Dee, she selected the coffee shop at Bute and Robson as a meeting point and, during the interview, referred to this section of Bute— closed to auto traffic--as an example of an excellent public space. Nearby, local cafes have transformed parking spaces on the street outside of their storefronts into outdoor seating. With so much area in North American cities devoted to auto use, listening to Marie's account and Grace's idea provides justification for looking for opportunities to convert auto space into public space.

These exchanges further inform the discussion in the previous chapter related to recommendations for public space. While we saw that walkways, common spaces and parks were the most frequently used public spaces and accommodated, overall, the most interaction, we also learned that people had many ideas of what could constitute useful public space. In these narratives just cited, we see the appropriation—both real and imagined—of automobile space for human play and interaction. This is similar to the repurposing of a cul-de-sac or a surface parking lot for non-auto use (such as an informal basketball or street hockey game). Urban designers can benefit from these narratives by looking for opportunities to transfer auto space into public space either completely, by reducing auto use, or partially, by creating spaces that can be used sparingly for autos (or emergency vehicles) but that can be safe to use as public space as well.

How interaction in public space has led to friendships

It's one thing to show that public space can facilitate social interaction, but another thing to say that the resulting social interaction leads to friendships. It could be that public space is like a party or event or convention in which people mingle and discuss common interests, but may walk away from the affair no closer to any of the attendees when leaving than when arriving. It

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would be useful to hear of occasions in which discussions in a public space did lead to meaningful friendships that otherwise would not have developed. Both Whohan (SOC = +0.65SD) and Marie offer such examples. In Whohan's story, she actually begins from a somewhat adversarial position. In Marie's case, she ends up with a very close friendship.

We'll begin with Whohan, who met someone on a local walking trail that she had previously only known via online social media, and struck up a conversation.

Whohan: Because I think that, maybe because people tend to walk the same places all the time. And so there are people who I have run into more than once now. So, it's not just a "hello," it's, "I remember, I talked to this person." Or they go, "I saw that person." Like it becomes more of a bit of a connection every time you run into somebody that you've seen someplace before. It becomes a little bit more of a connection, right? J is a perfect example of this. She's really good. We are diametrically opposed on many, many, many, many things--many things--but we also connect on some certain things. So we'd never met, outside of some conversations on Facebook. Crossed her on a trail, said hello because we sort of knew each other but we'd never met, but our faces were familiar.

Eric: How did you know each other?

Whohan: 'Cause at council, she stood up and talked, I've stood up and talked. We've been able to connect from that.

Eric: You're both active in the community.

Whohan: We're both very, very active in the community. And so that 'hello' built to more of a conversation and then the next time it strengthened the conversation and the next time we managed to have a private conversation that really shifted the foundation of a fairly antagonistic relationship to something that's not at all antagonistic. So it really did start, though, from a recognition of who that person was and just a simple hello.

Eric: So by using these public spaces meeting informally it sounds like you were able to move from a stranger status to a recognition status to, I don't know if intimate is the right word, but you knew each other fairly well and you could probably tell me her position on several topics.

Whohan: Absolutely. And vice versa. Yes, absolutely. Yep. Yep. And, I will also say, broke a barrier, because when I say we are diametrically opposed, we were vocally diametrically opposed. And it really broke a barrier. Not so much with her husband but with her for sure. We discovered--the two of us discovered--that we had so much in common that was outside of, and even partially within, those things that we had challenges with.

Eric: In what medium did you find out that you were diametrically opposed on topics?

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Whohan: A combination of Facebook and council.

Eric: Okay. These were, I would say, impersonal, anonymous venues, and you can correct me if you disagree with it, in that you don't have to see someone face to face to air your opinion, and there's opportunity to say something without a repercussion because you're not face to face. Whereas, meeting in the neighborhood, you were meeting in person. And that led to an opportunity for you to discuss something in more depth--you can see faces.

Whohan: Yep. Yeah. I think partially.

> *Eric: Is that all part of it?*

Whohan: I think that is part of it. I will say that I think for both these two people, me and J, I don't say anything online I won't tell you in person. Never, never, good or bad. Right. And I don't think J would either. But what the online did was only gave you that flat face. Right? So you only saw that flat face part of the person, whereas the one-on-one conversation allows you to see the more rounded person and allows you to see that there's more to that person than that flat face. As long as you're not yelling at each other, right?

> *Eric: So in the context of this study, the thing that I'm probing for, that I find interesting, is the value of physical public spaces and how much more valuable they are, or where they're more valuable than other venues, such as Facebook, or even a council meeting, where you're not speaking to each other by the nature of the--by the structure of the event--and how those affect relationships.*

Whohan: And that's, I think one of the reasons why I really feel the part of the challenge in Moody Center is there's no communal public space that provides enough of a, just enough structure to get people coming and not enough structure to inhibit that openness. Just getting to know each other and then having conversations. I think public space of any kind is critical to continuing discourse. Because what's happening online is not nice and most people are not like me and they're not like J.

Whohan's experience—turning a somewhat antagonistic online relationship into a benevolent in-person relationship—shows the potential of public space to develop connections in ways that are difficult to replicate in online forums. In her previous experience with J., Whohan was only exposed to J.'s positions on council matters—positions that were at odds with those of her own. It was only by meeting in an informal setting, in this case a neighborhood public space, that the two got to know each other in a more friendly and relaxed environment and manner, allowing them to find out that they not only had interests in common, but could respect each other despite their differences in political views. So, in Whohan's example, she was able to reconcile a negative relationship due to her informal contact in a local public space.

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Marie's experience is a bit different, in that there was no animosity to resolve. In her case, she shows how public space can be very instrumental in moving neighbors from an acquaintanceship to a friendship. Notice how public space was a critical element that facilitated children, and then their families, to become friends.

Eric: Keeping in mind that these are all optional questions, do you have groups outside of the neighborhood as well that you feel connected to?

Marie: Well, that's where I would say our kids' sports activities are probably the main thing.

Eric: Okay, and yet, there's some overlap with the neighborhood as well because-

Marie: Yeah, yeah. It's a little bit, not a lot, but somewhat. But, then within the neighborhood, in terms of I guess what I would call community, our community of friends that we have, we know a lot of people who live in our former building, and we are very good friends with one family there and we actually have a standing family date, if you want to call it that, for every weekend. We also have dinner together at one place or the other.

Eric: Every weekend?

Marie: Yeah.

Eric: That's amazing.

Marie: Yeah, and actually this weekend's going to be two nights in a row. We were at their place last night. They're coming to our place tonight. We each bring our own food usually, but then there's some sharing of it.

Eric: How did you meet?

Marie: Because our kids were the same age.

Eric: Through your kids?

Marie: Yeah. Well, they moved into that building ... We overlapped living there for maybe six months or so when our kids were very little, and then just being neighbors and having common interests.

Eric: You moved out of the building, but stayed in the neighborhood?

Marie: We just moved across the street from them, and they stayed in that building.

Eric: And, you just kept in contact with them?

Marie: Yeah, so they've been there for 16 years now or more.

Eric: How long have you been doing this weekend thing?

Marie: I think we probably started at least five years ago, about that. We've gotten to know them really well, and we've even met up with them in Europe when they've had trips that corresponded at the same time, so we've had that as well. Yeah, it's been more than five years. Yeah, so that is one really strong community connection that we have, and we have other friends in common as well, so we'll occasionally have a bigger group especially when the weather's nice, and have outside barbecues in that open lane because it facilitates that. It gives the space to bring tables out and have a bigger group.

Eric: This family, how did you meet that family and get to know them?

Marie: Because they literally--in that back lane--lived two doors away, and this was a situation where our kids were all outside playing there, so there's no way we couldn't get to know them.

Eric: That's how you met them?

Marie: Yeah.

Eric: Is that also how you got to know them better--through those interactions?

Marie: Yes, yes.

Eric: Did you have some other thing in common, some common interests?

Marie: Hockey.

Eric: Hockey?

Marie: Our kids played hockey.

Eric: So, perhaps you might have met them there also.

Marie: No, because they didn't play on the same teams. They were never on the same teams but there was just that common interest, so the kids would play at the hockey net outside, or once we moved to the other building, they'd come into the garage and play, so when the kids started to hang out together more, then as parents, we started to interact more. So, I think it was really the kids interacting more together ended up bringing the parents together, and then we realized we had so many things in common.

Eric: It was easier to be together?

Marie: Yeah, so it was actually--we really got to know them better after we had moved. We were in separate buildings, but because the kids were playing together, we ended up having more

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interactions and ended up getting to know each other better.

Eric: Have you been able to rely on each other for practical reasons like child minding?

Marie: Oh, all the time, yeah. Car rides, emergency things. Yeah, no, they are the first people we go to if we needed any help in the neighborhood and same for our kids. If they felt like they needed any help, they would immediately go to their family.

Eric: Do your kids still get along?

Marie: Oh, yeah. Absolutely.

Eric: To me, this sounds like an ultimate public space success story.

Marie: Yes.

Eric: I venture to say that you would not have met them had this public space not been available.

Marie: Yes.

Eric: Certainly not have gotten to know them, but now you have lifelong friends you depend on and meet with every weekend.

Marie: That's absolutely true.

Eric: I don't know how to top that story.

Marie: Yeah. No, I have had this conversation with other people many, many times. People who are living in that building, they recognize the value of having that space, and people in general in this community, they know how important having that structured space to interact is and the consequences of it. It's fairly well known, I would say, in terms of people who know about that building and what it provides. Yeah, we do feel very strongly about how that space has created a very strong sense of community.

Eric: If you lived in a high rise building, can you think of an analogous type of space that also would have worked to serve the same purpose for you?

Marie: Yeah, that's a really good question because we've had these conversation in regards to thinking about Stadium neighborhood and the plans they have for that. I don't know.

Eric: What you had was a ground based...

Marie: Exactly.

Eric: Your front door left out on the ground, so even in an apartment type, garden apartment, I don't know if you would have had exactly the same access to that outside space with your children that would have led to these encounters because it was when you were out there watching your children...

Marie: Right, exactly.

Eric: Although, I guess you were specifically out there with them. It wasn't that they were out playing while you were inside.

Marie: No, because they were young enough that we were out there with them.

Eric: Okay, so at that phase, even if it were a different housing typology, you would have been out in that public space with your children together?

Marie: Yeah.

Here is an excellent example of public space—in fact, appropriated public space—being a necessary element to a lasting friendship. Marie's children likely would not have gotten to know her friend's children if not for the hockey-amenable covered parking garage. By having a space in which the children could play, and in which the parents could also get to know each other, Marie's family and her friend's family gained a safety net for emergency help, a child minding resource, regular dinner company, and traveling companions. Of how much more benefit could purpose-built high-quality public space be to residents?

These exchanges speak to the conundrum that opened our discussion of the theoretical framework for this study, namely, How can we address the issue of causality? While it is very challenging (or impossible) to prove that 'B' resulted from 'A' in the sense that given 'A,' 'B' was somehow inevitable, it is often reasonable (I claim) to say the 'B' would not have occurred, at least not in the way it did, without 'A' having taken place. Marie's family became friends with another family in the neighborhood 'because of' the nature of the built environment in which they all lived. Might she have met them otherwise? Perhaps. Might she not have met them even in spite of the built environment? Certainly possible. But, how did it play out in the mind of Marie? In her opinion, the parking garage led to her children's play, which led to her children meeting friends, which led to her meeting neighbors, which led to a friendship. For her, this was a series of causalities. Similarly, Whohan understood that her reconciliation with J was facilitated by the public space they shared. In terms of architectural affordance, we can say that both ladies made use of the built environment that afforded them the opportunity to improve

their relationship with their neighbors. I suggest that this type of evidence is one of the strongest for causal connection. When someone says 'I did "B" because I experienced "A,"' they may be wrong (or lying), but most likely, this is how they really feel. Likely, they would again do 'B' if they again experience 'A,' which, from a practical perspective, provides us all we really find useful in causality, namely, predictability. In advancing a theory of architecture, such as architectural affordance, that seeks to link the built environment to perception, I suggest that both researchers and theorists can do no better than to ask users of the built environment, 'Why did you do that?' While this may not be as numerically satisfying as a controlled randomized experiment, the causal mechanism may be just as clear, if not clearer.

Interviewees' objections to density and terms for accepting it

Finally, there were a couple of opportunities I had to push back against interviewees who showed a distaste for high density (remember, all of my interviewees lived in high-density areas and they generally liked their neighborhoods). For these exchanges, I show parts of my interviews with Liz (SOC = +1.14SD) and with Ineth (SOC = +1.25SD). I tried to understand what it was they didn't like about high density and under what circumstances they would choose to live in a high-density environment. In the first exchange, with Liz, she talks about her need for privacy and how she relates this to density. Since she had already mentioned some aspects associated with density that she liked, I tried to see how these positives and negatives of density would play out for her.

> *Eric: Let's put on one hand, the value of open space, green space, lack of crowding and privacy. And the other hand, access to people, safety in numbers, people to talk with, people that are available. Where on that spectrum are you, how would you talk about that? The context of this study is (asking) how many people we can put together without driving them crazy and where it starts to break down. And it's a reaction to the idea that people just want privacy, maybe they want to be left alone. Maybe they're isolated. Where do we draw that... where is that line for you?*

Liz: Good question.

> *Eric: Was it a value of you... you looked at a lot of places to make a good decision. You saw the neighborhood the way it is. How much of that value was that there are people available there, other kids to play with, other people to talk to?*

Liz: Yeah, that was pretty important for us and I think where it feels a bit dense and, not necessarily crowded, but where it feels a little bit constrained is just the amount of that privacy space that's missing from it. So I think the communal space is pretty good, I would say it's excellent. There's a lot of communal space, but that sort of, our own green space... the ratio there I think for myself, is where I would want to take back some of that.

Eric: Specifically outdoor private space?

Liz: Yeah.

Eric: If I say the word semi-private to you, what do you think of?

Liz: So like, I think it's probably similar to what we have right now, where, for example our backyard it's... we have a backyard, but they're all... they're not blocked off. They're all kind of, sort of, shared. But you don't walk around in someone else's backyard, but you kind of have to if you're walking back and forth, because there ... we just back out into a bunch of trees, so we don't have... But there's paths walking around those ones. So that's what I think of. It's sort of yours, but there might be people walking through it. Or there might be someone walking past it and they can see.

Eric: All right, so is there value to you in having a semi-*private outdoor space? Or do you specifically want it to be private where you can be back there in your underwear?*

Liz: Yeah, I like that privacy.

Liz (to her child): Oh my gosh, that horse is gonna need a bath!

Eric (to Liz's child): I think so. That's a dirty horse.

Liz: I think that was a bit of a compromise when we picked here, and it's one of the ... I don't think we can fix it here, because I also don't like when you go into your private backyard, but it's the size of where we are sitting here, where it is all you could have is maybe a chair and a little table, and you know, maybe a flower box if you're lucky.

Liz: For me, I can't be in that space very comfortably. I'm going to feel... A lot of the new places talk about a private backyard, but like this... the kids can't play in here. There is nothing you can do here, so where we are... Again, we picked it because the kids can run around out here, but it means... I mean there are other kids that are running around back there. Or there are people there that are walking around on the path, so it was sort of a choice that we made. I think where we were talking about more green space and less people in our perfect complex, I think for me, it might not necessarily be much more common space, maybe organized a bit differently, but it'd be more personal green space.

Eric: Okay, what is enough personal or private outdoor space for you*? What do* you *need to do there for it to be enough?*

Liz: So I like having a little spot to have a vegetable garden, a little spot to have a barbecue and a little table, and...

Liz (to her children): Oh gross you guys, that's really dirty.

> *Eric (to Liz's children): That's a dirty cat and a dirty horse.*

Liz (to her child): Yeah, what are you putting them in? They're wet.

Liz's Kid: Dirt.

Liz (to her child): All right. Carry on. Yep, they're gonna have some baths.

Liz: I think having a spot to have a glass of wine and a book, and lay on a hammock, and not have people looking at you while you're reading and with your wine. It's also just that privacy in that you don't feel like people are looking. Like when we lived in our condo, we had our own green space, but you had like 300 people that were looking at you while you're in there. Because I was looking at them when they were down there, so it didn't really feel like you could be comfortable there even though it was green space, because you knew you were surrounded by windows. And chances are, at least a few of them, that people were watching you. Not in a bad way, but just because...

> *Eric: You're just not fully private.*

Liz: Yeah, not at all.

> *Eric: Okay, so let me ask this. If you could have enough private outdoor space for that, would you be willing to live in a neighborhood that had that little bit more private space, a larger central public space, and higher density?*

Liz: Yeah

So, Liz would accept higher density if she could have more outdoor private space. Ineth also resisted density, but her concern was more about losing access to nature. Since she had already spoken of how much she enjoyed having amenities within walking distance (an aspect of density), I pushed her to tell me how much density she would accept, and under what conditions.

> *Eric: You mentioned two things, one is, you wouldn't want this neighborhood to be any denser, and, the other is, you mentioned how much you enjoy having a walkable neighborhood. My question is, if your neighborhood could become ... Could accommodate more people without ...*

Ineth: Yeah, you're getting into tricky ...

> *Eric: What I'm trying to point out, there are two things that are somewhat conflicting with each other. You have a place that you can walk to because it's dense. If it were not this dense you couldn't walk to as many things, you wouldn't have as many options. What would you be willing to trade? Would you be willing to have more density if you have more walking options? If it could be even more walkable, without feeling more crowded.*

Ineth: As long as it's not in ... As long as the density isn't ... Do you mean in my neighborhood, because I don't ... Because the-

> *Eric: Even as...*

Ineth: Walkability is into ... Out of the neighborhood.

> *Eric: Let's say they develop here next door.*

Ineth: Which they are.

> *Eric: Which they're going to. And it had twice as many people and twice as many amenities, the kinds of things* you'd *like to walk to. Would you go to there?*

Ineth: Would I move into that?

> *Eric: Let's say, would you just visit it? Would you go and walk there? Would you ...*

Ineth: No, because I don't like walking ... I don't even like being and really ... I'll ... We'll go downtown once in a while, but I sure wouldn't want to live in there. And if ... And I don't like even being ... I know, here's a good ... Like Newport Village is one of the first kind of commune ... It was the first place that they developed here in Port Moody. It's got ... I don't know how many towers are over there. And it's very dense, they have some green spaces, but they're not evident. They've lots of shops. We ... I can walk there from here, but I would never want to live over there. It's got lots of traffic, it's got noise all the time, it's cement, it's lots of cement. Lots of amenities, there's restaurants, there's towers, there's also some low-rise buildings. But it's not green, and it's not ... No, I wouldn't want to live like that.

> *Eric: How about if...*

Ineth: No.

> *Eric: Well, would it be acceptable if they took out the traffic and the hardscape and replaced it with grass or greenery? And what else was it you didn't like about it-- the noise? And if it were quiet, would it be okay then?*

Ineth: Yeah.

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I don't know if Liz and Ineth came away from the interviews as converts to density, but I was able to get a sense of what their objections to it were and what trade-offs would be required for them to accept it. I think these are discussions that planners and developers should be having with potential residents of new developments. Until we better understand people's real objections to density, we will be poorly situated to increase it without resistance.

These last two exchanges inform our understanding about residents' objections to density. My conceptual framework for the survey was that density would influence sense of community primarily through the mediating variable of crowding, the negative perception of density. As we saw (and as virtually all studies seem to corroborate), feelings of crowding are very weakly associated with measures of density. And yet, so many people seem to object to density. Why, if not due to crowding? I believe this question deserves much more attention. For Liz, the answer was clear—she wanted more outdoor private space. For Ineth, the answer had more to do with losing access to nature. Clearly, these answers are anecdotal, but, are they also representative? I've chosen to focus on sense of community, but a developer looking to bring a dense development into a residential neighborhood, or a planner interested in re-zoning a neighborhood to accommodate higher density, would do very well to gain a better understanding of all the reasons why people in that neighborhood might oppose density and what it would take to get them to accept it.

<center>***</center>

The findings of this study can provide guidance for architects, planners and developers. Architects should consider that public space is essential to large-scale developments. They should think through how users may actually access and use public spaces and how these spaces can provide affordances for residents to interact. Planners should understand that people have legitimate, rational reasons for opposing density. By understanding what these reasons are, planners will be in a better position to incentivize development that accommodates neighborhood needs and provides a built environment that optimizes residents' quality of life. Developers should consider how best to use non-rentable/non-salable community space so as to maximize the marketability of rentable/salable space, and to take pride in providing their cities with high-quality real estate development. If these findings can facilitate such guidance and reflection, they will prove useful.

Applying architectural affordance to public space recommendations

Having reached a point in our investigation at which we can begin to move past examples of correlation and into arguments for causality, we are now in a position to see if we can apply the theoretical framework with which we began our discussion to the implications distilled from the narratives presented in this chapter. While the sample sizes are obviously small, we can assume, for the sake of testing our theory, that the viewpoints embodied in these narratives are representative of some meaningful percentage of the population (and leave the burden of proof to future research).

To begin this discussion, let's review the relationships assumed within the theory of architectural affordance[22]. Here, again, is Table 1 from Chapter 1:

environment >	elements >	affordances/ constraints >	agency/desires/ limitations >	user >	feeling/ actions
		signifiers >	perceptions >		

As noted in Chapter 1, this table represents a flow of influence. The physical environment provides spaces for physical elements to exist. These elements provide affordances, constraints, and signifiers, which in turn, facilitate or engender agencies, desires, limitations, or perceptions on the part of users of the space and motivate alterations in their feelings or actions. Affordances are not inherent within elements, but rather relate to the relationship between the element and the user[23]. How might we relate these ideas to our narrative findings regarding appropriation of vehicle space for pedestrian use, use of public space in forming and developing relationships, and conditions for residents accepting higher densities? Let's see.

Marie and Grace both spoke of appropriating automobile space for pedestrian use. In Marie's narrative, she referred to her actual experience allowing her children to use an underground parking area. In Grace's narrative, she speculates on the potential opportunities that might arise from blocking part of a road. These narratives differ, but we can consider them together. In each case, the environment under discussion is automobile-dominant space. These

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[22] As defined in Chapter 1, *architectural affordance* posits that the built environment influences human perception and behavior by providing both affordances (opportunities and encouragement to experience some feeling or perform some action) and constraints (corresponding limitations or discouragement).

[23] For example, 'sit-ability' in not inherent in the element we call a 'chair' (or in its constituent parts) but rather describes a relationship between the element and a potential user.

areas are meant for driving and vehicle passage. Pedestrians use these spaces at their peril. Cars have the right of way. There are no pedestrian-centric elements in these spaces provided by the designers because they are designed to be clear for traffic. In Marie's narrative, her children added a hockey net and play items (balls and pucks) to the environment. In Grace's narrative, she proposed adding a 'park' and fixed furniture. In both cases, these elements would afford new opportunities to pedestrian users and constraints for persons wanting to drive. These would be minor constraints in the story of the parking area (hockey nets and the attendant children are movable) and major constraints in the story of the blocked roadway (in which drivers would have to reroute). For the parking area, the signifiers are weak (possibly just the presence of a hockey net) and may even be contradictory (like a sign saying 'NO PLAYING IN THE PARKING AREA'). For the blocked road, the signifiers (presence of chairs, planters, maybe some play equipment) would be striking, especially to those who had previously seen the road only as a road and could never have imagined that it could be anything else. For those looking for overflow seating from the nearby café, or, for anyone looking for a spot to relax and socialize, the signified affordance of the new recreation area might be compelling, and may influence them to stop and sit. Local residents aware of the presence of these new amenities might make arrangements to meet friends there. Or, they may plan to leave their homes to use the space alone because they want a place to be outside on a nice day. There are many scenarios we can imagine in which such changes to the built environment, or changed norms as to appropriate ways in which to use it, may influence, or 'cause', new perceptions and behavior.

Whohan and Marie both provide narratives that speak to the heart of this study, namely using public space as venues for improving relationships and building friendships. In Whohan's narrative, she has a relationship that experiences a change of environment—from virtual to physical—when she meets her counterpart on a local nature trail. Although it is not explicit from the discussion, this neighborhood has a very nice nature area with popular walking trails. What were the elements in this case? At minimum, a trail. Likely, we could also consider trees and other greenery to be contributing elements. The trail obviously affords walking, but it also clearly afforded recognizing other people and stopping to chat. This implies a certain dimension (in width) of the trail—wide enough to afford stopping but not so wide as to allow vehicle use. The generally linear shape of the space would signify that it is a space for passage. The natural setting and winding nature of the trail would signify that the type of passage for which it is most

suitable is pleasure rather than utility (such as commuting). Note that Whohan and J. met in this space and quickly found common ground. Could it have been related to the literal ground they were on? Did the elements in this environment provide signifiers and affordances that drew them both to that place to express similar agency and experience similar feelings? Would their conversation have been different if meeting in a more universally utilitarian space, such as a grocery store? I think it is fair to speculate that this environment afforded them an opportunity to meet and develop a positive relationship that they may not have had in a different setting.

This is certainly true for Marie. Although her children and her neighbor's children all had a common interest in playing hockey, they would not have met (at least, not to play hockey) without the parking area environment. There was also another outdoor common space in which different families could meet to barbecue and share meals and conversation. This allowed for a transition from kids playing together to families interacting together. It's not clear from the discussion what elements existed in the other outdoor space, but one can imagine a common table and BBQ grill—or, at any rate, room for them. So, again, we can trace the progression: A common outdoor environment provided space for amenity elements (hockey nets, seats, tables, grills) that signified affordances that gave users agency to interact and develop friendships. We obviously can't assert that the environment 'caused' a friendship, but we can argue that it was highly influential in making it possible.

What about our last two narratives related to accepting higher density? Can we frame this issue in terms of architectural affordance? Liz's main objection to high density seemed to stem from her desire for private outdoor space. Indeed, this is a very precious resource in high-density environments. Private indoor space can be multiplied vertically, but not so with outdoor space, unless it's covered (as with balconies), and then it is very hard to make private. So, for people like Liz, high density represents a loss of a desirable amenity. We may not be able to solve this with architectural affordance, but perhaps we can use it to deconstruct and understand the problem. Let's consider the environment in question to be the public realm, from the ground up, in a high-density area. The needed element is some form of visual screen, which needs to afford privacy without constraining the essential outdoor amenities of sunlight and fresh air. Also, there must be signifiers in place to show that some spaces within this environment are inaccessible—both physically and visually—to anyone who is not entitled to control the space. The intended user of the space should feel whatever feelings she associates with her concept of

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privacy (protection? anonymity? enclosure?). A solution to Liz's requirement then, from an architectural affordance perspective, would likely involve some element that affords her the opportunity to experience the kinds of feelings that she associates with her notion of 'privacy'.

Ineth might be a harder sell, as she seemed to have multiple points of dissatisfaction with dense environments, especially those with high rise buildings in it. She spoke about her aversion to 'cement', traffic, and noise, and her preference for 'green' spaces. So, for a dense environment to appeal to Ineth, it would likely require elements such as plants, trees, and other softscape. Constraints would include hardscaped areas, especially those designed for auto traffic. Note that both affordances and constraints for Ineth are generally psychological rather than physical (she would simply avoid areas with the above constraints and gravitate toward those with the above affordances). The effects upon Ineth would be both perceptual (if she had to be there, for some reason, her experience and mood would be affected for better or worse) and behavioral (either she would be motivated to be physically present there or to be absent). So, arguably, a dense environment—perhaps any environment—would influence Ineth positively or negatively depending upon whether it held elements that represented affordance or constraint to her.

Through this brief exercise, we've seen that architectural affordance can be a consistent framework within which to discuss and understand relationships between the built environment and its human users. Whether this framework proves useful for deconstructing and analyzing this relationship in other settings as well remains the work of future research.

Chapter 7: Conclusion

I gathered the data for this study during 2019, but I did the write up during the coronavirus pandemic of 2020. The pandemic has increased the public's awareness of the relationship between our built environment and our behavior. We have had to modify both our environment and the way we use the environment in order to avoid catching and spreading a disease. We have also had to modify, to one extent or another, the way in which we gather together and interact. I would have structured this research differently if I had begun it this year instead of three years ago, but the questions would be more relevant than ever in the context of a pandemic. Issues of density, sense of community, and how we use public space are even more critical now that there is this new factor in the mix. Still, the findings of this study set a useful 'pre-COVID' baseline as a point of reference and will continue to be applicable both during and after the pandemic.

Not only is the relevance of this study's findings (involving issues of density, sense of community, and use of public space) heightened by the pandemic, so, in fact, is the relevance of the theoretical framework. Issues of causal relationships involving the built environment and human behavior are literally life-and-death matters in ways that few would have predicted less than a year ago. Signifiers that describe new constraints (reminding people to stay two meters apart) have become ubiquitous and many public space affordances (such as seating) have been reduced or removed. It is clear that the topics of causality and affordance have become prominent, even if people are only applying them on an emergency ad-hoc basis rather than as either theoretical constructs or as empirically precise parameters. For example, restaurant owners that serve customers indoors, but block off every other seat, have made a conscious decision—though likely based on neither theory nor observation--that their old seating arrangement carries an unacceptable probability of 'causing' a disease transmission, but that the risk associated with the modified seating is acceptable. At a theoretical level, though, the issue is the same for the urban designer deciding where to place a public bench or table as for the restaurateur removing seats. Whether the object is preventing the transmission of disease or increasing the transmission of pleasantries, the implicit assumption is that affordances will affect, or even effect, outcomes. So, while this study was about the relationship between density and

sense of community rather than about the relationship between density and disease transmission, a study of either relationship could proceed from the same theoretical framework.

In this study we have been able to consider the relevance of this theoretical framework of architectural affordance. For example, we've seen that there is a substantial relationship between the use of some public spaces (such as playgrounds) and sense of community. But, does use of playgrounds enhance sense of community or does sense of community enhance use of playgrounds? Could they enhance each other? Could some tertiary factor enhance them both individually? To address the last question, we've looked at several potential confounding variables to reduce the possibility that the relationship is conflicted. As for the direction of influence, the survey alone was ill-suited to address this question, but the subsequent interviews provided insight. The answers to the question asking whether the interviewees thought they had become more familiar with their neighbors by interacting in their neighborhood public spaces showed that they overwhelmingly thought the answer was yes. (Whether their sense of community caused them to use the spaces more was immaterial.) As demonstrated in the extended exchanges in Chapter 6, we see further confirmation (even if anecdotally) that public spaces were instrumental in leading to friendships, an accepted theoretical component of sense of community. Thus, we have a strong argument for both the association between some public spaces and sense of community and for the direction of causality. We can argue, then, within the framework of architectural affordance, that some types of public space better afford opportunities for increasing sense of community than do others.

We are also now in a better position to speak to other issues with which we began our study, including

- What is sense of community?
- How do we react to urban density?
- How does urban density influence sense of community?
- And, What role does public space play?

So, let's consider these.

As noted in the literature review, researchers have associated sense of community with such concepts as belonging, membership, interdependence, support, connection, commitment, empowerment, sharing, and participation. We reviewed several definitions that involved combinations of these words. But, it would be odd to suggest that any definition could capture

some universal feeling that everyone would have that could be labeled 'sense of community' (or, if it could, that we could prove it). Also, simply asking people whether they have a sense of community (or, worse, asking them to numerically rate it) gets us nowhere, since we would have no way of knowing whether their definition (or scale) were the same as ours (or anyone else's). Still, we *can* add to knowledge of what sense of community might be and what people think it is in two ways--we can choose a definition for sense of community and create questions that we think test for this definition, and we can present people with the phrase and ask them what they think it means. This study did both. In the first case, we saw that the questions I asked to test for sense of community had a very tight internal consistency. This alone does not confirm that I actually tested for sense of community (I could have very consistently tested for something else entirely), but, given the alignment with previous theoretical bases for the term, it seems reasonable to conclude that the test items do, in fact, relate to the thing we call sense of community. In the second case, I asked interviewees what they thought sense of community meant. (I didn't want to burden my survey respondents with any more essay questions than they already had.) The interviewees spoke about concepts such as safety, familiarity, connection, ownership, engagement, and belonging. These descriptions harmonized with those found in previous research, though there was also great variation among the interviewees in what they prioritized. The consistency was strong enough to make the argument that sense of community is an actual 'thing,' a sense with a definitional range that is common enough to claim that all of my interviewees were describing approximately the same feeling. On the other hand, there was also sufficient variety in the answers to make the argument that what *exactly* it means to each person is likely always at least a little bit different. So, this study has added to our knowledge of what sense of community is, both as a generalized construct and as a range of interpretations.

It has also given us further insight into how people react to density, at least within the context of the area of study, the Greater Vancouver Regional District. As noted in the literature review, several studies have associated density with negative perceptions. Yet, it may be difficult to generalize the findings of these studies or to know whether the objections found in one city or neighborhood apply to another. It may be that objections tend to be geographically specific, or even related to some demographic or personal trait. This study took a quantitative look as associations between density and sense of community, perception of crowding, and perception of safety. As we saw, all of these associations were very weak, although very dense

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areas tended to have lower sense of community scores. What the study did note, however, were specific objections to density. Liz disliked density because she associated it with a lack of private outdoor space. Ineth (from the same neighborhood), on the other hand, disliked density because she associated it with a lack of green space. While anecdotal, these responses suggest that objections to density may vary from person to person. A planner or developer seeking neighborhood approval to increase local density would do well to survey local residents, not just on their preference for density, but on what specific objections they may have. Otherwise, much effort and money might be spent on solving the wrong problem by overcoming the wrong objection.

As noted in the literature review, no prior studies have sought to relate density and sense of community as comprehensively as this study has. While the study found the association to be very weak, this was a significant finding for two reasons. First (and foremost for the intent of the study), it tended to dispel the assumption that high density and sense of community are incompatible. While the relationship at very high density is negative, related data, such as the association between sense of community and certain types of public space, suggest that this negative relationship may be moderated. Second, this study found no negative association between sense of community and low or very low densities. This finding (while incidental to the study) is in stark contrast to the accepted wisdom of much current planning theory, especially within the realm of New Urbanism, that associates suburban densities with alienation and lack of social cohesion. The findings of this study make a strong argument that—whatever else its faults—there seems to be no lack of sense of community in low-density suburbia.

Finally, our literature review discussed the role of public space in fostering sense of community and in moderating the relationship between density and sense of community. We also took a particular look at how to measure and evaluate public space. This current study does much to advance our understanding of the role public spaces play in sense of community. The survey provides numerical links between both the frequency of usage of public space, and the frequency of interaction in public space, and the sense of community of residents. I am aware of no other study that has done this. Thus, this study has provided quantitative data to suggest what types of public space may be most amenable to enhancing residents' sense of community. The interviews have added to this knowledge by answering questions about how they use their public spaces and how they would suggest improving them. They have also added to the argument of a

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causal relationship between public space and sense of community by specifically discussing *how* these spaces have led to interactions and increased trust. And, as described in Appendices 'I' and 'J', this study has suggested a methodology for comparatively evaluating neighborhood public spaces and describing them in a purposeful manner.

Applications

Additional to furthering knowledge of these above issues raised in the literature review, the findings presented in this study find application in several areas in both practice and academia.

Practice

This study has many applications to practice. Developers may refer to the findings of this study to inform what kinds of common spaces and amenities might be most marketable to prospective buyers. New developments often include expensive lobbies, recreation areas, or other non-rentable/non-salable spaces. It may be that developers perform extensive market research to know how best to optimize a return on investment for such spaces, but such research does not seem to be widely available and, even if it exists, would likely consist more of *predictive* data (surveying what people say they *would* want) rather than *commissioning* data (surveying what people think about their *existing* environment), as the building industry rarely thinks ahead by looking behind. Thus, decisions to provide expensive amenities may be no more than mere guesses at what future residents may find appealing. Further, even if surveyed, the things people may expect to prioritize (like privacy and security) may be at odds with what they end up liking about their neighborhood (like accessibility and walkability). The advantage of a study like this is that developers can get a sense of what people *actually* like and don't like in their own developments and which *existing* amenities they value.

Planners may refer to the findings of this study to inform both to what extent they should incentivize or dis-incentivize high-rise/high-density development and what kinds of public space or community amenity contributions they should require developers to provide. In Vancouver, the planning department allows density bonuses in exchange for community amenity contributions. But, both sides of this equation contain unverified value assumptions—first, that the added density does some sort of harm for which compensation is required, and, second, that there is some nexus between the kind of value provided by the amenity and the kind of harm done by the density. In a vacuum of knowledge, how is one to say that any of this makes sense?

This study speaks to both sides of this balance—what kind of harm (if any) density causes, and what kind of amenities might be most appropriate to ameliorate it.

Architects may refer to the findings of this study to inform their designs of common spaces and open spaces in and around buildings in ways that facilitate positive interaction among users. While architects are the ones who must ultimately design such spaces, they may not end up optimizing them for residential sense of community for any number of reasons. Architects have many design considerations and this one may simply not be a priority. Even an architect interested in providing amenity space can only do so with the permission of the client (generally, for a residential project, a developer) who may be driven to maximize rentable/salable space and expects no return from space 'lost' to amenities. In such cases, an architect may see little value in 'fighting' for more amenity space. However, research such as this, showing a potential market value for such amenities, may prove useful to an architect seeking to convince a client to make a project 'nicer.' It can also inform where and how best to 'spend' the amenity space.

Academia

This study also has many applications for academia. Community psychologists interested in studying sense of community could benefit from the methodology I used, which introduced new test items for sense of community, showed that they were superior to previously used and commonly accepted test items, and showed that using only a few of them could produce reliable results. Based on a review of literature in the field (see Appendix 'A'), the study of sense of community, at least in terms of measurement, has stagnated. Also, the field lacks a consensus of which test items are best suited to measuring sense of community. This study has shown that neighborhood sense of community can be tested very well with only a few test items, including test items introduced in this study. Future community psychologists interested in studying neighborhood sense of community would benefit from reviewing the methodology used here.

Planning theorists interested in density, public space, and the effects of urban policy could benefit from these findings. In particular, advocates of New Urbanism may be surprised that this study found residents' sense of community in suburban neighborhoods to be no less than that of residents in higher-density areas. Further, planning instructors enamored with urban density would do well to consider the objections to density found in both the literature review and in the interviews. Conversely, those convinced that density is antithetical to quality of life would do well to see that the findings do not support that idea either.

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Architectural studios that present students with larger-scale design challenges could benefit from the findings of this study that show both how residents may use their environments as well as the nature of urban environments that they may prefer. As noted in the literature review, architecture lacks a developed theory. The theoretical framework of architectural affordance that I presented here could fill this lack and provide a meaningful frame of understanding that could accommodate, I think, a wide range of architectural issues.

Limitations

This study was primarily limited by funding and sponsorship, which, in turn, limited the ability to advertise the survey. A primary audience for the study was people who live in high-rise buildings, but such people were almost completely inaccessible. The one major exception was when one property management company, Associa, agreed to advertise the study to residents in its several hundred buildings. About two-thirds of my respondents (I believe) came from that sponsorship. The study was generally not limited by potential interviewees, as I had over two hundred volunteers, but was somewhat limited in that not many of them were in the target areas of my study. Similar future studies would do well to secure either municipal or private-sector support to reach an adequate number of potential respondents.

Future research

Some items from this study may be suitable for future research. We have looked at density in terms of a fundamental aspect of human quality of life, people's sense of community. But, this is only one, and by no pretention the most important, consideration in understanding how to make life better for people in dense environments. As cities continue to densify, many factors related to people's lived experience are useful to research in connection with density. Especially worthy of study are populations that may be especially challenged by dense environments, such as families with small children who need outdoor space in which to play and engage with peers. The current pandemic has also brought new challenges to dense environments and public space. How the built environment should change to serve residents optimally during this pandemic, after it, and during the next one, is a highly fertile field for research.

While planning and architecture researchers have taken some interest in sense of community, most serious research on the topic has fallen to the domain of the community psychologists. There is ample opportunity to further study public spaces and their relationships

with sense of community. Public space, in general, has received little research, and, while it can be considered for its relationship with many social and personal benefits, I suggest that sense of community makes an excellent dependent variable with which to evaluate the effectiveness of public space. Such research might even take the form of quasi-experiments for researchers who can find or create similar spaces with controllable differentiators. A better understanding of what makes public space conducive to enhancing sense of community would benefit several stakeholders.

This study has also introduced the theory of architectural affordance, which is ripe for discussion and exploration. If it proves untenable, the field of architecture has little to fall back on. Perhaps one could further advance the theory of architectural determinism, but very little has been done with it to date despite ample time to do so. Affordance might be interesting enough to engender an enthusiasm that determinism, so far, has not. It is the hope of the author that architectural affordance will continue to be critiqued, explored, and applied to future research.

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In this study, we've considered how best to address the question of causality in linking interventions in the built environment to human perception and behavior, and I've presented the theoretical framework of architectural affordance as the most suitable approach to doing so. We've considered sense of community and density both separately and relatedly, and seen that this relationship represents a gap in literature and a gap in knowledge. Using an explanatory-sequential mixed methods study, including both an online survey and semi-structured interviews, we've found evidence that urban density has a negative but very weak relationship with sense of community. We've also seen, however, that some public spaces, such as walkways and parks, have a moderately positive relationship with sense of community, and might offset the negative influence of high-density environments. We've also heard several perspectives and discussions of what influences individuals' sense of community and what recommendations they have to improve public space in their neighborhoods. This quantitative and qualitative information may benefit anyone interested in better understanding the relationship between urban density and sense of community.

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Appendix A: Summary of previously used sense of community measures

Note: The discussion that follows in this appendix is adapted from the prospectus for this study.

While there is a general consensus that sense of community involves groups of people, there is a lack of agreement as to its conceptual constructs, as well as to the specific attributes that define it and how to measure them. Participants at a Psychological Sense of Community seminar at the 1997 Society of Community Research and Action debated whether sense of community should be framed as "a cognition, a behavior, an individual affective state, an environmental characteristic, or a spiritual dimension," but without consensus (Chipuer & Pretty 1999, p 644). There is also a lack of consensus among researchers as to whether sense of community is limited to an individual experience or whether it can exist as a group experience (and, if it can, whether it can be measured as such). While community psychologists tend to be concerned with an individual's experience within a larger context, Jason et al. (2015) argue that sense of community requires a three-layer ecology composed of the individual, the microsystem (the individual's immediate network within the community), and the macrosystem (the community). Several researchers have sought to frame sense of community as an essential part of some larger construct (such as community capacity (Piscopo et al. (2017)) or as inextricably linked to a similar but separate construct (such as civic participation (Talo et al. (2014)).

Two significant advances have been made in the theoretical basis of sense of community research. The first was a book by Sarason (1974) that framed and defined sense of community as a legitimate field of research. The second was a paper by McMillan & Chavis (1986) that condensed and arranged much of the thinking of their time on sense of community into a theoretical framework composed of four elements. These elements included *membership* (a feeling of belonging), *influence (*a sense of agency within a group), *fulfillment* (a sense that the group can help meet one's needs), and *connection* (a sense that one shares history and experiences with the group). From this framework, they proposed a definition of sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis 1986, p9). This framework has served as the basis for many subsequent efforts to measure sense of community (Chavis & Pretty 1999).

While this framework has informed many tests of sense of community, many researchers have ignored it, or even rejected it, in producing their own scales and indices. In the following section, I summarize notable studies of sense of community from the available literature. This is not a comprehensive list of all studies of sense of community, but rather favors studies that have been widely cited, those that focus on neighborhood (place-based) sense of community, and those that were conducted in a North American context. (Note that Glynn predates McMillan & Chavis (1986)).

A brief history of testing sense of community:

- Glynn (1981), in the first published study of sense of community, used 133 questions (120 Likert plus 13 longer answer questions) in his test.

- Buckner (1988) reviewed studies associated with the concepts of attraction to locale, neighboring, and psychological sense of community to generate a pool of questions intended to test neighborhood cohesion, which he paired down to 18 questions.

- Perkins et al. (1990) conducted a study of neighborhood participation in New York City and measured sense of community using a twelve-item scale based on the definition outlined in McMillan and Chavis (1986) and developed in Chavis et al. (1986). Although they do not specify it, this seems to be the first empirical use of the twelve questions commonly associated with the study by Chavis et al. (1986) and used by subsequent researchers as a common standard (the questions do not appear in Chavis et al. (1986)) (Chipuer & Prety 1999).

- Nasar & Julian (1995) used an abbreviated form of Glynn's test, paired down to eleven questions but increased to a five-point scale. They specifically intended to test sense of community related to community of place rather than community of interest. Nasar & Julian's set of questions share no exact wording with the question sets of Buckner (1988) and of Perkins et al. (1990, based on Chavis et al. 1986), but has much conceptual overlap. Nasar & Julian considered their short version of Glynn's scale to achieve substantial face validity (the questions addressed the construct) and discriminant validity (the questions remained unrelated to other constructs). They also found significant relationships between sense of community score and the number of neighbors respondents knew by name, and between sense of community score and the number they considered friends.

- Brodsky et al. (1999) used a modified version of the Chavis et al. index that included ten of the standard twelve questions.

- Chipuer & Pretty (1999) adapted the short form of the Sense of Community Index (SCI, first used by Perkins et al. (1990)) to measure sense of community in the workplace. They recommend further use and development of the SCI (to further substantiate it as a default scale) and call for inclusion of items related to the built environment as a mechanism to relate built environment factors to sense of community.

- Obst et al. (2002c, p123; see also Obst et al. 2002a and Obst et al. 2002b) conducted an assessment of psychological sense of community that included seventy-five items, and of neighborhood identification that included twenty-two items, derived from a variety of sources, including
  - *the Sense of Community Index (SCI; Chavis et al., 1986),*
  - *the Psychological Sense of Community Scale (PSCS; Glynn, 1981; short form: Nasar & Julian, 1995),*
  - *the Neighborhood Cohesion Instrument (NCI; Buckner, 1988),*
  - *the Community Satisfaction Scale (CSS; Bardo & Bardo, 1983),*
  - *the Urban Identity Scale (UIS; Lalli, 1992),*
  - *the Multidimensional Measure of Neighboring (MMN; Skjaeveland et al., 1996),*
  - *the Three Dimensional Strength of Group Identification Scale (Cameron, 2000), and*
  - *the Strength of Ingroup Identification Scale (SGIS) (Brown, Condor, Mathews, Wade, & Williams, 1986).*

- Blanchard (2007) proposed a version of the sense of community index (Chavis et al.1986) for use in virtual communities.

- Peterson et al. (2008a) used an eight-item Likert-type test, based upon the McMillan & Chavis (1986) framework, that they called a Brief Sense of Community Scale. Their study showed an overall Chronbach's alpha of .92 for this test and subscale alphas ranging from .77 to .94.

- Peterson et al. (2008b) conducted two studies of sense of community in community organizations. For the first, they used a Community Organization Sense of Community Scale which had sixteen five-point Likert-type questions and subscale coefficient alphas ranging from .42 to .78. The second study used a revised version of the scale with eight six-point Likert-type questions and subscale coefficient alphas ranging from .79 to .92.

- Chavis et al. (2008) produced an updated version of the sense of community index that includes 24 items rated on a Likert scale (instead of the original 12 items rated true or false (Chavis N.D.)). This revised index (SCI-2) showed a high overall reliability (coefficient alpha = 0.94) and a high subscale reliability (coefficient alphas ranging from 0.79 – 0.86) in a survey of 1800 people.

- Christens & Lin (2014) examined participation in community organizations using an eight-item Likert-style psychological sense of community scale.

- Forsyth et al. (2015 p239), studying pro-environmental behavior, measured sense of community by asking only two questions—"When you think about your community, how often do you think in terms of your neighborhood?" and "When you think about your community, how often do you think in terms of (your city)?"

- Jason et al. (2015) created a nine-item Psychological Sense of Community Scale based on their theory that sense of community requires engagement at individual, microsystem, and macrosystem levels. They considered their test to have a better fit than the Sense of Community Index, which they considered flawed.

- Ahmad & Talib (2016) used the 12-item sense of community test devised by Chavis et al. (1986) in their study of the role of sense of community in mitigating the relationship between community empowerment and sustainability.

- Walton (2016) conducted a qualitative study of sense of community based on the theoretical construct of McMillan & Chavis (1986), but she based her rating system (high, medium, low) on discursive analysis of unstructured interviews, precluding general applicability to other studies.

- Boyd et al. (2017), in their comparative study of sense of community, sense of community responsibility, public service motivation, and employee motivation, used the eight-item, seven-point Brief Sense of Community Scale (Peterson et al. 2008) and found it to have a high (.936) Cronbach's alpha level, suggesting a high level of validity for the test.

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- Jabareen & Zilberman (2017) used the 12-item Sense of Community Index to compare sense of community to sociocultural perceptions and typological characteristics of the built environment.

- Piscopo et al. (2017, p 62) measured sense of community as part of a study of community capacity by using a question from United Kingdom census data, namely, "How strongly do you feel you belong to your immediate neighborhood?"

Ideally, a review of such a history of testing on a particular subject would provide clarity as to which instruments are best suited to answering the common questions that the researchers posed. Unfortunately, such clarity is lacking. While the Sense of Community Index has been used more than other systems, there is a lack of consensus as to its validity. Flaherty et al. (2014) provide a highly critical analysis of the Sense of Community Index. In their study of 523 college students, they showed a poor performance of the SCI, much of which they blame on the random reverse coding of the questions. (They find the Peterson et al. (2008a) index more compelling.) They suggest abandoning the 12-item SCI, though not the McMillan & Chavis (1986) model upon which it is based. They argue that continued use of the SCI is not justified and that future work should focus on testing new scales. Jason et al. (2015) note that several researchers have failed to validate the theoretical structure of McMillan & Chavis' Sense of Community Index through either exploratory or confirmatory factor analyses. They also note that researchers' efforts to amend, adjust, and revise the SCI have failed to resolve its validity limitations. They suggest that researchers need to not only improve testing instrumentation but challenge and validate the underlying theoretical assumptions that they have largely accepted since McMillan & Chavis (1986) established the dominant theoretical basis of subsequent sense of community research. They imply Sarason (1974) might be a better theoretical starting point (one they believe also comports with their own construct of individual, microsystem, and macrosystem). However, none of the tests is perfect, or even universally convincing. Despite rigorous statistical testing, there seems to be little widespread acceptance of any set of questions to test neighborhood (or any other) sense of community.

Of particular interest to this study is the validity of questions to test *neighborhood* sense of community. Neighborhood sense of community (a place-based, proximity-dependent, community of convenience or necessity (but rarely, or minimally, of interest)) is contained within the umbrella category of psychological sense of community. Communities of interest may coalesce around workplace interactions or around any number of common avocations (religion, country of origin, study group, online forum, etc.) (Boyd et al. 2017). Such communities of interest likely detract from the need for (and thus the effect of) communities of place. Other than access to help in emergency situations, this detraction may not be detrimental to the individual, who simply may prefer to associate with her religious affiliates or fellow immigrants than with her neighbors. However, since the purpose of this literature review is to investigate useful questions to test for *neighborhood* sense of community, it is important to understand how this construct differs from the more general issues of psychological sense of community and align the questions accordingly.[1] In light of this emphasis, it becomes critical to make an informed decision whether to adopt an existing index, combine indices (or parts

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[1] I will also consider the effects of communities of interest on overall sense of community, but the focus of my inquiry is on place-based communities and the role of the physical environment.

thereof), start from scratch to create a new index, or choose some other option. The first step is to consider the legitimacy of existing indices that researchers have used.

As we've seen that there is disagreement among the above researchers over which questions best capture sense of community, and over the relative validity of these questions, it is important to consider them critically to see which are useful for this study. A review of the studies listed above provides a combined pool of 103 items, as shown in Table 1.

	STUDY->	SUBSCALE*	Glynn 1981**	Buckner 1988	Perkins et al. 1990	Nasar & Julian 1995	Chipuer & Pretty 1999	Brodsky et al. 1999	Chavis N.D.	Obst et al. 2002a**	Obst et al. 2002c**	Blanchard 2007	Chavis et al. 2008	Peterson et al. 2008a	Peterson et al. 2008b	Flaherty et al. 2014	Christens & Lin 2014	Jason et al. 2015	Ahmad & Talib 2016	Boyd et al. 2017	Jabareen & Zilberman 2017
	NUMBER OF ARTICLES CITING (from webofknowledge.com accessed 2018-01-31)->		119	257	296	82	132	97	-	53	86	66	-	104	24	2	-	4	2	0	1
	# OF POINTS IN SCALE (2 = T/F)->		5	5	2	5	3	5	2	7	7	4	4	5	6	5	5	6	5	7	5
	QUESTIONS:																				
1	Overall, I am very attracted to living in this neighborhood.			X						X	X										
2	I feel like I belong to this neighborhood.			X						X	X										
3	I visit with my neighbors in their homes.			X						X	X										
4	The friendships and associations I have with other people in my neighborhood mean a lot to me.			X						X	X										
5	Given the opportunity, I would like to move out of this neighborhood.			X						X	X										
6	If the people in my neighborhood were planning something I'd think of it as something "we" were doing rather than "they" were doing.			X						X	X										
7	If I needed advice about something I could go to someone in my neighborhood.			X						X	X										
8	I think I agree with most people in my neighborhood about what is important in life.			X						X	X										
9	I believe my neighbors would help me in an emergency.		X	X						X	X										
10	I feel loyal to the people in my neighborhood.			X						X	X										
11	I borrow things and exchange favors with my neighbors.			X						X	X										
12	I would be willing to work together with others on something to improve my neighborhood.			X						X	X										
13	I plan to remain a resident of this neighborhood for a number of years.			X																	

#	Item		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17
14	I like to think of myself as similar to the people who live in this neighborhood.			X	X					X	X									
15	I rarely have neighbors over to my house to visit.				X					X										
16	A feeling of fellowship runs deep between me and other people in this neighborhood.				X					X	X									
17	I regularly stop and talk with people in my neighborhood.				X															
18	Living in this neighborhood gives me a sense of community.				X															
19	I think my [block] is a good place for me to live.	R			X		X	X	X	X	X	X				X		X	X	
20	People on this [block] do not share the same values.	R			X		X	X	X	X	X	X	X			X		X	X	
21	My [neighbors] and I want the same things from the [block].	R			X		X	X	X	X	X	X				X		X	X	
22	I can recognize most of the people who live on my [block].	M			X		X	X	X	X	X	X	X					X	X	
23	I feel at home on this [block].	M			X		X	X	X	X	X	X				X		X	X	
24	Very few of my [neighbors] know me.	M			X		X	X	X	X	X	X				X		X	X	
25	I care about what my [neighbors] think of my actions.	I			X		X	X	X	X	X	X	X			X		X	X	
26	I have no influence over what this [block] is like.	I			X		X		X	X	X	X	X			X		X	X	
27	If there is a problem on this [block] people who live here can get it solved.	I	X		X		X	X	X	X	X	X	X			X		X	X	
28	It is very important to me to live on this particular [block].	S			X		X		X	X	X	X	X			X		X	X	
29	People on this [block] generally don't get along with each other.	S			X		X	X	X	X	X	X				X		X	X	
30	I expect to live on this [block] for a long time.	S			X		X	X	X	X	X	X	X					X	X	
31	If I feel like talking, I can generally find someone in this neighborhood to talk to right away.			X			X													
32	I DON'T care whether this neighborhood does well. (reverse scored)			X			X			X										
33	The police in this neighborhood are generally friendly.			X			X			X										
34	People here know they can get help from others in the neighborhood if they are in trouble.			X			X			X										
35	My friends in this neighborhood are part of my everyday activities.			X			X													
36	If I am upset about something personal, there is NO ONE in this neighborhood to whom I can turn. (reverse scored)			X			X													
37	I have NO friends in this neighborhood on whom I can depend. (reverse scored)			X			X													
38	If there were a serious problem in this neighborhood, the people here could get together and solve it.			X			X													

#	Item											
39	If someone does something good for this neighborhood, that makes me feel good.		X		X							
40	If I had an emergency, even people I do not know in this neighborhood would be willing to help.		X		X							
41	What is good for this neighborhood is good for me.		X		X							
42	Being a member of this neighborhood is like being a member of a group of friends.		X		X							
43	We have neighborhood leaders here that you can trust.		X		X							
44	There are people in this neighborhood other than my family who really care about me.		X		X							
45	I don't care if SF fandom does well.		X					X				
46	I feel good when my fellow fans do good things.		X					X				
47	People know that they can get help from others in SF fandom if in trouble.		X					X				
48	I have no friends in SF fandom on whom I can depend.		X					X				
49	If I have a personal problem, there is no one in SF fandom I can turn to.		X					X				
50	My friends in SF fandom are part of my everyday activities.		X					X				
51	If I feel like talking I can generally find someone in fandom to chat to.		X					X	X			
52	If I had an emergency, even people I don't know in SF fandom would help.		X					X	X			
53	I anticipate how some members will react to certain questions or issues in this group.										X	
54	I get a lot out of being in this group.										X	
55	I've had questions that have been answered by this group.										X	
56	I've gotten support from this group.										X	
57	Some members of this group have friendships with each other.										X	
58	I have friends in this group.										X	
59	Some members of this group can be counted on to help others.										X	
60	I feel obligated to help others in this group.										X	
61	I really like this group.										X	
62	This group means a lot to me.										X	
63	It is important to me to feel a sense of community with other community members											X
64	I get important needs of mine met because I am part of this community.											X
65	This community has been successful in getting the needs of its members met.											X

#	Statement	Code				
66	Being a member of this community makes me feel good.		X			
67	When I have a problem, I can talk about it with members of this community.		X			
68	People in this community have similar needs, priorities, and goals.		X			
69	I can trust people in this community.		X			
70	Most community members know me.		X			
71	This community has symbols and expressions of membership such as clothes, signs, art, architecture, logos, landmarks, and flags that people can recognize.		X			
72	I put a lot of time and effort into being part of this community.		X			
73	Being a member of this community is a part of my identity.		X			
74	Fitting into this community is important to me.		X			
75	This community can influence other communities.		X			
76	Members of this community have shared important events together, such as holidays, celebrations, or disasters.		X			
77	I feel hopeful about the future of this community.		X			
78	Members of this community care about each other.		X			
79	I can get what I need in this neighborhood.	NF	X			X
80	This neighborhood helps me fulfill my needs.	NF	X			X
81	I feel like a member of this neighborhood.	MB	X			X
82	I belong in this neighborhood.	MB	X			X
83	I have a say about what goes on in my neighborhood.	IN	X			X
84	People in this neighborhood are good at influencing each another.	IN	X			X
85	I feel connected to this neighborhood.	EC	X			X
86	I have a good bond with others in this neighborhood.	EC	X			X
87	People have a real say about what goes on in (organization name).	RO		X	X	
88	People in (organization name) respond to what I think is important.	RO		X	X	
89	Being in (organization name) allows me to be around important people	OM		X	X	
90	(Organization name) helps me to be a part of other groups in this city.	OM		X	X	
91	(Organization name) is respected in this city.	IO		X	X	
92	(Organization name) gets a lot done in this community.	IO		X	X	

#	Item	Subscale	...	...	...	...	...	...	...	...
93	I like living in this town; (city name) is the place for me.	BC			X	X				
94	(City name) is a good place for me to live.	BC			X	X				
95	I think this (community) is a good (community).							X		
96	I am not planning on leaving this (community).							X		
97	For me, this (community) is a good fit.							X		
98	(Members) can depend on each other in this (community).							X		
99	(Members) can get help from other (members) if they need it.							X		
100	(Members) are secure in sharing opinions or asking for advice.							X		
101	This (community) is important to me.							X		
102	I have friends in this (community).							X		
103	I feel good helping this (community) and the (Members).							X		

*SUBSCALE: M = membership, I = influence, R = reinforcement of needs, S = shared emotional connection, NF = needs fulfillment, MB = membership, IN = influence, EC = emotional connection, RO = relationship to organization, OM = organization as mediator, IO = influence of organization, BC = bond to community

**article includes other questions not listed here

Table 1: A summary of sense of community measures

It would not be practical to expect survey participants to answer this many questions, so some pruning is in order. To this end, I applied the following filters:

- studies that focused on *neighborhood* sense of community (for relevance)
- studies conducted within the last ten years (for currency)
- indices employed by more than one study (for agreement)

After applying these filters, our items are reduced from 103 to 20, a more realistic set of questions to ask a participant to answer.

How legitimate are the remaining twenty items? My next test was to imagine what criticisms *I* might have if *I* had to answer these questions on a survey. The remaining twenty questions, and my critiques, are listed in table 2.

Item	Possible criticism	Peterson et al. 2008a	Flaherty et al. 2014	Ahmad & Talib 2016	Boyd et al. 2017
I think my [block] is a good place for me to live.	(no criticism)		X	X	
People on this [block] do not share	Why should I feel alienated because		X	X	

the same values.	my neighbors have different values?				
My [neighbors] and I want the same things from the [block].	How much is there to want? Safe, clean, friendly--what else?		X	X	
I can recognize most of the people who live on my [block].	Most? A lot of people live here. I might recognize some of them.			X	
I feel at home on this [block].	(no criticism)		X	X	
Very few of my [neighbors] know me.	Maybe I only want to know a few of my neighbors.		X	X	
I care about what my [neighbors] think of my actions.	Ok, but maybe I care what everyone thinks of my actions, or maybe I don't care what anyone thinks but I'm happy to be here.		X	X	
I have no influence over what this [block] is like.	This could be very ambiguous depending on what I think "like" means--quality?, style?, safety?, demographics?, what?		X	X	
If there is a problem on this [block] people who live here can get it solved.	Pretty good, but what kind of problems? Graffiti? Potholes? Gang violence? What are we getting ourselves into here?		X	X	
It is very important to me to live on this particular [block].	(no criticism)		X	X	
People on this [block] generally don't get along with each other.	How should I know? I get along with most people (as far as I know).		X	X	
I expect to live on this [block] for a long time.	There are many communities, especially with high percentages of renters, where a negative response could be misleading.			X	
I can get what I need in this neighborhood.	This seems to imply a relationship between access to goods and communal fealty.	X			X
This neighborhood helps me fulfill my needs.	(no criticism—this seems to imply emotional, rather than material, fulfillment, as in13 above.)	X			X
I feel like a member of this neighborhood.	(no criticism)	X			X
I belong in this neighborhood.	(no criticism)	X			X
I have a say about what goes on in my neighborhood.	(no criticism)	X			X
People in this neighborhood are good at influencing each another.	I don't necessarily want people influencing *me*.	X			X
I feel connected to this neighborhood.	(no criticism)	X			X
I have a good bond with others in this neighborhood.	(no criticism)	X			X

Table 2: Items used in recent tests of sense of community

In reviewing the above items from the perspective of a potential survey respondent, I find that several of the questions are ambiguous. This is disconcerting, as they have been developed,

used, tested, and advocated by professionals in the community psychology field, a field that I had hoped would deliver clear, sensible, uncontested metrics to judge a construct that is well beyond my ken. The most straightforward solution would be to assume that these questions, though appearing flawed to a lay person, do in fact support a robust body of theory and are, because of this, the best option (Schwartz 2014). However, some aspects of theories that apply to overall psychological sense of community may not apply to neighborhood sense of community, making items that apply to the former but not the later irrelevant. For example, According to Jason et al. (2015, p 975):

"The broadest ecological construct, or macrosystem, is *Entity*, upon which the community is formulated (e.g., neighborhood, school, or organization).Within this domain, items refer to characteristics of the group, such as common goals, purpose, and objectives."

But, in what sense does a neighborhood have "common goals, purpose, and objectives"? These attributes may have meaning in a community of interest, such as an organization or a school, but what is the distinctive "goal" of a community of place, such as residential neighborhood, other than to provide a nice place for its residents to live? A commercial or industrial neighborhood may have goals to which leaders of the businesses within its boundaries may ascribe, but I have found no studies that have sought to measure sense of community among such stakeholders within such neighborhoods. Other than neighborhood improvement or collective opposition to some local nuisance, there may be little that residents could consider a common purpose around which to rally. It is also unclear that such a purpose would be a necessary factor in an individual's sense of community, though it might be somewhat contributory. Still, weighting it equally to questions related to belonging or connection seems inappropriate for a neighborhood sense of community test.

Given such ambiguity both in theory and in application, I face the question of whether I may presume to create legitimate alternatives to existing items used in previous studies rather than restricting my study to using questions formed by others. Arguments against this presumption are formidable.

- I have no training in community psychology.
- I have not produced a comprehensive critique of existing (generally accepted) theory.
- I have not consulted with trained community psychologists in forming new questions.
- I have not tested new questions for statistical validity.
- I have not shown consensus among community psychologists that specific existing questions are invalid.

These arguments may be weighed against the arguments in favor of creating new test items to evaluate neighborhood sense of community.

- There is a lack of consensus among community psychologists as to the validity of any item intended to test sense of community.
- There is a lack of consensus among community psychologists as to the validity of any index intended to test sense of community.
- There is a lack of consensus among community psychologists as to the validity of any theoretical construct defining sense of community (though there is a high level of agreement around much of the conceptual framework).
- There are calls among researchers (especially recently) for new indices to test sense of community.
- There is a lack of focus in the literature on the specific requirements to test for *neighborhood* sense of community.
- There is an overall paucity of evaluative studies of sense of community in recent years.

- There is a specific paucity of recent studies of neighborhood sense of community.
- Recent studies tend to eschew the most popular sense of community index (SCI).

While the legitimacy of a lay researcher creating a new sense of community index is far from clear, I think it the lack of consensus among experts noted above provides an opportunity for innovation. Of course, such a revision should be grounded in some theoretical basis. To provide this basis, I reviewed the content of the 103 items generated by the studies listed above (Table 1). This review resulted in a list of common characteristics listed in Table 3. This list of characteristics represents the intent behind the questions listed in the various indices referenced. For comparison, I include the SCI framework theorized by McMillan & Chavis (1986) in the second column. I also consider whether the attachment in question applies to the neighborhood (the place) or to the neighbors (the people). The numbers correspond with the items in the subsequent index.

CHARACTERISTIC	SCI FRAMEWORK	People	Place
Similarity	Membership/Connection	1	
Identity	Membership/Connection	2	3
Connection/belonging	Membership/Connection	4	5
Access (casual)	Membership	6	
Access (emotional)	Fulfillment/Connection	7	
Access (functional)	Fulfillment	8	
Access (emergency)	Fulfillment	9	
Agency	Influence		10
Comfort		11	12

Table 3: Characteristics to assess related to neighborhood sense of community

From this taxonomy I generated a new index with the following items:

1. My neighbors are a lot like me.
2. It's easy for me to fit in with my neighbors.
3. I'm glad that I live in my neighborhood.
4. I feel a sense of connection with many of my neighbors.
5. I belong in my neighborhood.
6. I have neighbors I can chat with when I want to.
7. I have friends in my neighborhood.
8. If I need to borrow something, I don't mind asking my neighbors for it.
9. If I have an emergency, my neighbors will help me.
10. If my neighbors and I want to improve our neighborhood, we can.
11. I feel comfortable being around my neighbors.
12. I feel comfortable walking around my neighborhood.

Based upon a review of the literature, and a critical consideration of the testing options, I suggest the best test of sense of community would involve some combination of existing, tested items, and new, revised items. I suggest using a combination of an adapted version of the original 12-item Sense of Community Index (Perkins et al. 1990) to provide continuity with an existing, established index, and the new index above, as based on a critical review of the most relevant items used over the last 30 years, as a means of testing items specifically tailored to a neighborhood setting.

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Appendix B: Site selection

Note: The discussion that follows in this appendix is adapted from the prospectus for this study.

The nature of this study was such that it would require personal data collection pegged to specific spatial (geographically-defined area) locations. To enhance validity, it would have been ideal to collect a sufficient amount of data from several comparable sites. It was difficult to predict whether this would be possible.

Site selection criteria

Several factors limited the potential sites available for this study. Some requirements included:
- **Proximity**—The site must be close enough for me to access for visual in-person inspection and analysis.
- **Accessibility**—The site must be open to the public. Ideally, building common spaces would also be accessible. Also, there must be some practical means of contacting potential respondents.
- **Data availability**—Building and site data must be available for density calculations.
- **Density**—The site must include high-density neighborhoods with high-rise buildings.
- **Variety**—The site must include varying levels of density. Ideally, the site (or sites) will contain varying levels or types of other criteria as well, such as building types, rent levels, amount of public space, and other potentially confounding factors to allow for comparison of density levels while controlling for these confounding factors. While variety of confounding factors may be instructive if the sample size becomes large enough to account for them, it may also be undesirable if the confounding data overwhelm patterns of correlation between density and sense of community. In this respect, it may be ideal to compare two sites that have varying levels of density but most other factors in common except for one (such as open space). This could provide an opportunity to control for at least one potentially significant confounding variable (such as open space).
- **Generalizability**—The site must be representative of potential future development so that the findings may have some practical applicability.

Site selection process

Based on the above criteria, I had several priorities in mind when selecting appropriate sites for this study. Table 1 shows how I ranked these priorities and how they translated into a final list. The first priority was proximity. I had no funds for traveling, so it was important to find sites that I could reach easily from the UBC campus. This limited my search to areas within the Greater Vancouver Regional District. Fortunately, this was not a great hindrance, as many suitably dense sites were available within this region.

Rank	Priority	Rationale	Process	Result
1	Site accessibility	Sites must be available for me to reach easily by car or public transportation due to time and budget constraints		I will limit my consideration to the Greater Vancouver Regional District
2	Density range	Sites must contain a significant range of distinguishable residential housing densities	I used Google Earth to identify potential sites by using a 'bird's eye' perspective with building massing shown to find high-density neighborhoods	I identified twenty-one potential sites
3	Percentage family	Sites must contain a high percentage of families with elementary-school-aged children as literature shows this demographic to be especially vulnerable to lack of sense of community in high-density environments	I used Canadian census data to evaluate which sites had the highest percentage of children aged 5-9	I identified 11 sites with over 3% of population children between 5 and 9 years old
4	Difference in public space	A primary intent of this study is to evaluate the role of public space in developing sense of community	I used Google Earth to subjectively rank the quality of the public space associated with each site on a scale from 1 to 5	I selected eight sites total from the previous 11, including 4 with 'good' public space and 4 with 'poor' public space

Table 1 - Initial site selection criteria and priorities

My second priority was finding areas that had a mix of densities, including very high densities. To do this, I used Google Earth to locate neighborhoods with a mix of high-rise and non-high-rise developments. This produced a list of twenty-one sites. (See Figures 1 and 2)

Figure 1 - Sample bird's eye view showing area of density mix including high-rise development
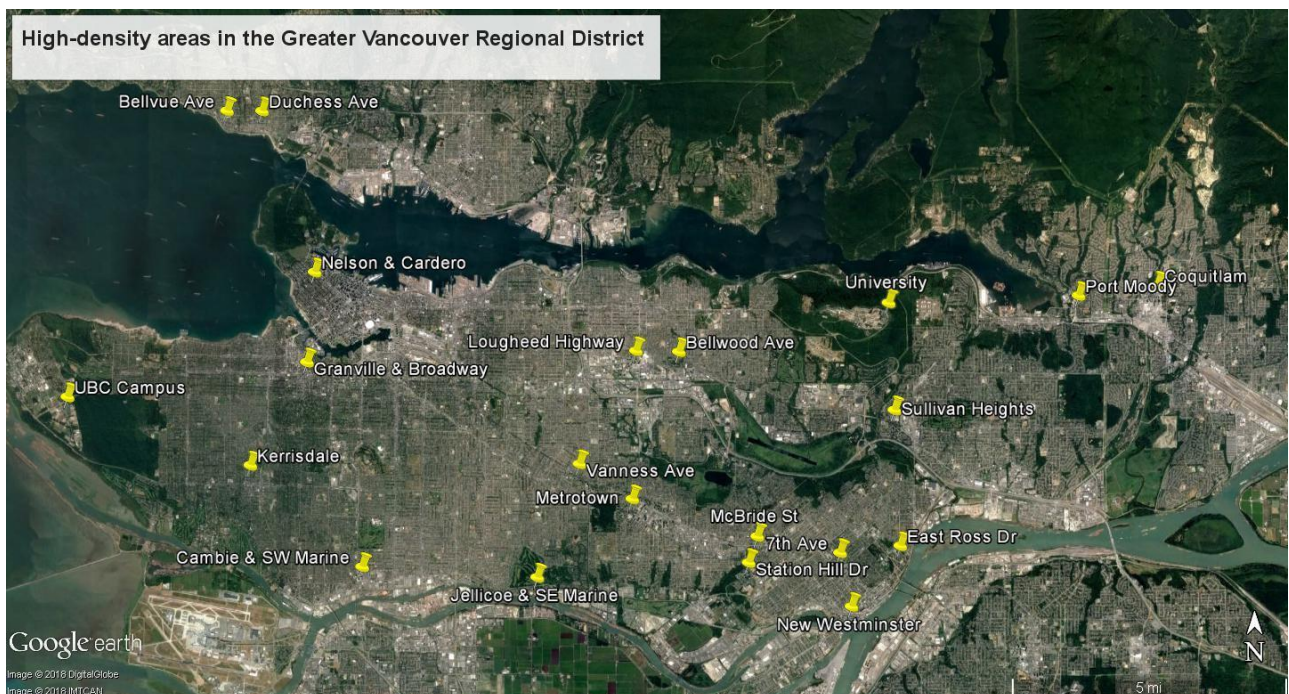
Figure 2 - Areas in GVRD with mix of high-rise and low-rise developments

Of these sites, I wanted to select those that had a high percentage of families with young children. I wanted to target this demographic because I believe that it is especially vulnerable to

a lack of sense of community. Young children rely heavily on their neighborhood for social interaction because they cannot take themselves to other venues (other than school). Very young children may not be ready for socialization (at least not for minimally supervised socialization, as are young children) and older children may be able to travel outside of their neighborhood for social needs. Most adults have opportunities for socialization outside of the neighborhood based upon work, religion, sports, or other interests. But, young children are captive to the neighborhood. Also, they are in a formative period of developing social skills, making available community and sense of community critical. In light of this, my third priority was to screen the above-mentioned sites to find those that had a high percentage of young children. I used Canadian census data to calculate the percentage of children age five to nine (this is a census category) within the dissemination areas associated with the sites. I found the sites with the highest percentages and reduced my number of sites from twenty-one to eleven.

Fourth, I looked at the public space on the sites. I want to evaluate the quantity and quality of public space as a moderating influence on sense of community. I investigated the sites using Google Earth and rated the public space of each according to a five-point scale. The rating scale was arbitrary but informed by related literature. It was approximately as follows:

1—poor (surface parking, no greenery, no place to meet or interact)
2—fair (some common spaces but not conducive to interaction)
3—average (a moderate amount of outdoor space for interaction)
4—good (thoughtful landscaping with places to linger and interact)
5—excellent (all outdoor spaces are inviting and conducive to interaction)

This was an informal investigation meant to quickly distinguish the sites based upon the visual information available in Google Earth. Still, it was possible to understand the sites well enough to form a level of distinction sufficient for selection. This last evaluation reduced the number of sites from eleven to eight, including the four with "good" public space ("UBC campus," "Vanness Ave," "Bellwood Ave," and "Sullivan Heights") and four sites with "bad" public space ("Metrotown," "Univercity," "Port Moody," and "Coquitlam").

id	GE-identified locations	DA #	population	population totals	population age 5-9	% age 5-9	GE public space rating	DA exceeds neighborhood	selected	population age 0-14	population age 0-14 totals	verified
1	UBC Campus	59154 035	53 0		40					125		
2	UBC Campus	59154 034	10 45		50					130		
3	UBC Campus	59150 945	41 0		10					40		
4	UBC Campus	59154 036	12 76		100					260		
5	UBC Campus	59153 981	15 21		55					205		
6	UBC Campus	total		4782	255	5.3 %	5		*		760	YES

#	Street	ID				%						
7	Bellvue Ave	59153332	708	708	20	2.8%	3			35	35	
8	Duchess Ave	59150045	605	605	10	1.7%	3			35	35	
9	Kerrisdale	59150567	567	567	15	2.6%	2			55	55	
10	Granville & Broadway	59153132	1359	1359	20	1.5%	1			100	100	
11	Nelson & Cardero	59150837	452	452	5	1.1%	2			15	15	
12	Cambie & SW Marine	59150488	472	472	5	1.1%	2			20	20	
13	Jellicoe & SE Marine	59153491	1025	1025	30	2.9%	2			90	90	
14	Vanness Ave	59153500	401		15					35		
15	Vanness Ave	59153499	1128		25					90		
16	Vanness Ave	59151467	520		10					40		
17	Vanness Ave	59153832	3241		140					375		
18	Vanness Ave	total		5290	190	3.6%	4		*		540	MAYBE
19	Metrotown	59151299	1008		30					90		
20	Metrotown	59151298	1250		40					125		
21	Metrotown	59151300	430		15					70		
22	Metrotown	total		2688	85	3.2%	2		*		285	
23	Lougheed Highway	59151406	5636	5636	120	2.1%	3	YES		460	460	
24	Bellwood Ave	59151399	903	903	35	3.9%	4		*	100	100	NO
25	Station Hill Dr	59153654	1267		35					135		
26	Station Hill Dr	59153653	1805		65					205		
27	Station Hill Dr	59153655	2126		120					365		
28	Station Hill Dr	total		5198	220	4.2%	3				705	YES
29	McBride Blvd	59151336	1301		55					160		
30	McBride	59153	10		55					155		

	Blvd	385	50										
31	McBride Blvd	59151338	2457		85						265		
32	McBride Blvd	59151343	995		30						65		
33	McBride Blvd	total		5803	225	3.9%	3					645	YES
34	7th Ave	59152955	962		25						65		
35	7th Ave	59152954	1311		45						150		
36	7th Ave	59152953	1179		15						45		
37	7th Ave	total		3452	85	2.5%	2					260	
38	New Westminster	59153660	1140		25						80		
39	New Westminster	59153657	2818		65						200		
40	New Westminster	total		3958	90	2.3%	4					280	
41	Univercity	59153695	3499	3499	200	5.7%	2	YES	*	490	490	MAYBE
42	Sullivan Heights	59153381	4003		90						325		
43	Sullivan Heights	59152961	1531		100						250		
44	Sullivan Heights	59153355	1881		60						210		
45	Sullivan Heights	total		7415	250	3.4%	4	YES	*		785	YES
46	East Ross Dr	59153363	4826	4826	175	3.6%	3			560	560	MAYBE
47	Port Moody	59154004	1910		45						130		
48	Port Moody	59153960	3988		185						590		
49	Port Moody	59154005	350		35						65		
50	Port Moody	59153045	627		40						125		
51	Port Moody	total		6875	305	4.4%	2		*		910	YES
52	Coquitlam	59152995	5621		220						680		

53	Coquitlam	59151 649	65 6		25					70		
54	Coquitlam	total		<u>6277</u>	<u>245</u>	<u>3.9 %</u>	2		*		750	YES

Table 2 -Site selection matrix showing selected sites and area totals of age group 0 to 14 to suggest whether a sufficient number of families live in these areas to generate a useful response rate

This process produced a reasonable set of sites for study (see Table 2). However, it also had several limitations. First, while high-rise development generally corresponds closely with urban density, it is possible to have high-rise development in lower-density areas and high-density areas may not have high-rises. Second, while I had selected the high-rise sites with the highest percentages of children aged five to nine, I did not know how these areas compared to the rest of the region. I may have selected areas that had a relatively low percentage regionally. My initial approach had prioritized, high-rise, then percentage age five to nine, then public space. I decided to recheck my results by prioritizing high density first instead of high-rise. To do this, I created a map using censusmapper.ca that showed population density based on Canadian census data (see Figure 3). The results (at the dissemination block level) showed that most of my sites were indeed in areas of high population density ('Univercity" was an exception). However, when I next used censusmapper.ca to check areas with a high percentage of children aged five to nine (at the dissemination area level), the results were not validating (see Figure 4). They suggested that only "UBC Campus," "Bellvue Ave," "Kerrisdale," "McBride St," "Port Moody," and "Coquitlam" would all contain a high percentage of the designated age range. Still, even this was a reasonable list, although the sites would be harder to differentiate based upon public space. Unfortunately, it was still unclear how accurate this second evaluation was because censusmapper.ca does not produce data tables, making precise data control and evaluation difficult. Also, while I could evaluate population density and percentage of age five to nine in individual maps, I could not investigate these together.

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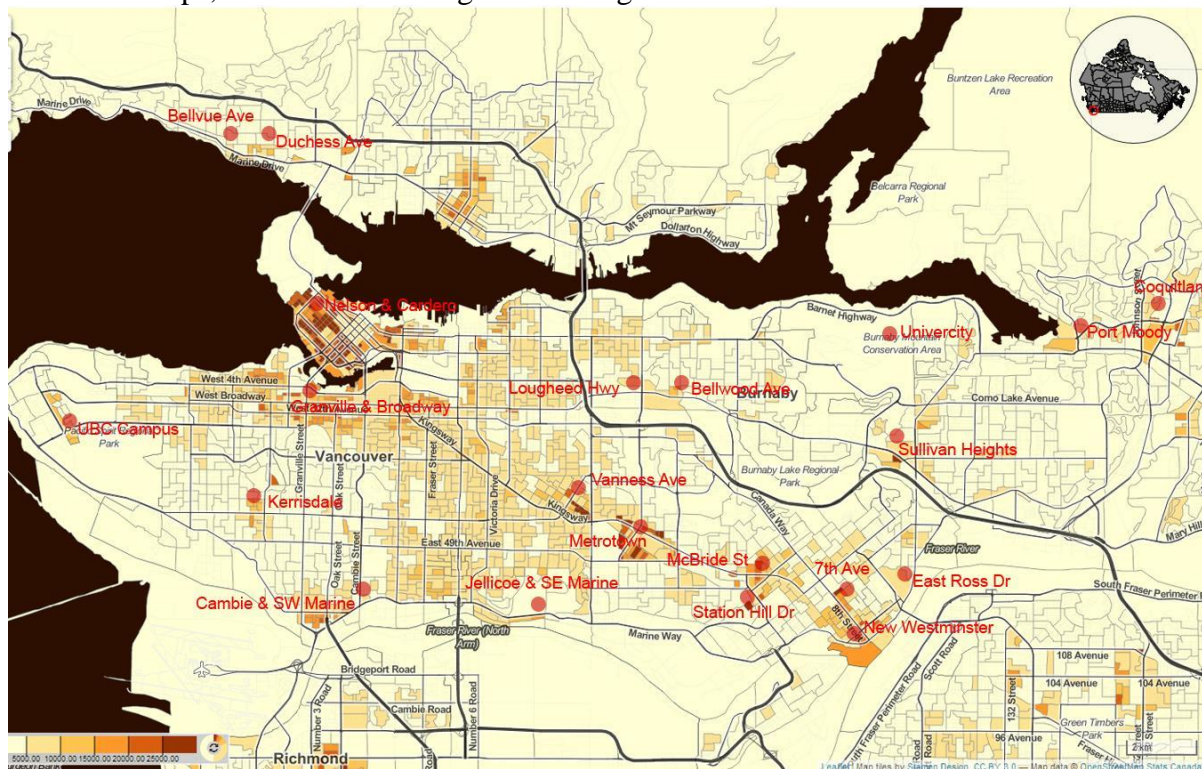
Figure 3 - Selected sites overlaid onto map of population density (darker is higher density) (source censusmapper.ca)

Figure 4 -Selected sites overlaid onto map of population age 5 to 9 as percentage of total population (darker is higher) (source censusmapper.ca)

To gain better control over the data inputs, I decided to use the Canadian census data directly. This proved to be an involved process. The first challenge (after acquiring the data from Statistics Canada) was opening the data files. The required data files were too big to open in Microsoft Excel, so I opened them in Microsoft Access and filtered to isolate the Greater Vancouver Regional District. Population data was available at the Dissemination Block level, but the demographic (age) data was only available at the (larger) Dissemination Area level (see Figure 5). I used Access to join the files (Dissemination Blocks are contained within Dissemination Areas—see appendix for full hierarchy). This allowed me to export a combined and truncated file to manipulate in Excel. In Excel, I sorted the Dissemination Blocks according to a combined filter of BOTH the top ten percent densest (a minimum density of 9,500 people per square kilometer) AND the top twenty percent age five to nine (a minimum of 6.7% of the total population being age five to nine). I saved the resulting list of Dissemination Blocks into a .csv file and imported it into QGIS. In QGIS, I joined this table to the related shapefile to show where these blocks were. Then, I exported the truncated shapefile from QGIS into Google Earth Pro to compare it with the initial list of high-rise sites I had developed at the outset. The resulting comparison showed a low correspondence between the initial sites and the later-selected Dissemination blocks. Still, a few showed overlap or close proximity. These were "UBC Campus," "McBride St," "New Westminster," and "Port Moody." Although "McBride St" seemed to have an average provision of public space, "Port Moody," with its fair rating and the other two with their excellent rating, represent a reasonable range of public space to evaluate.
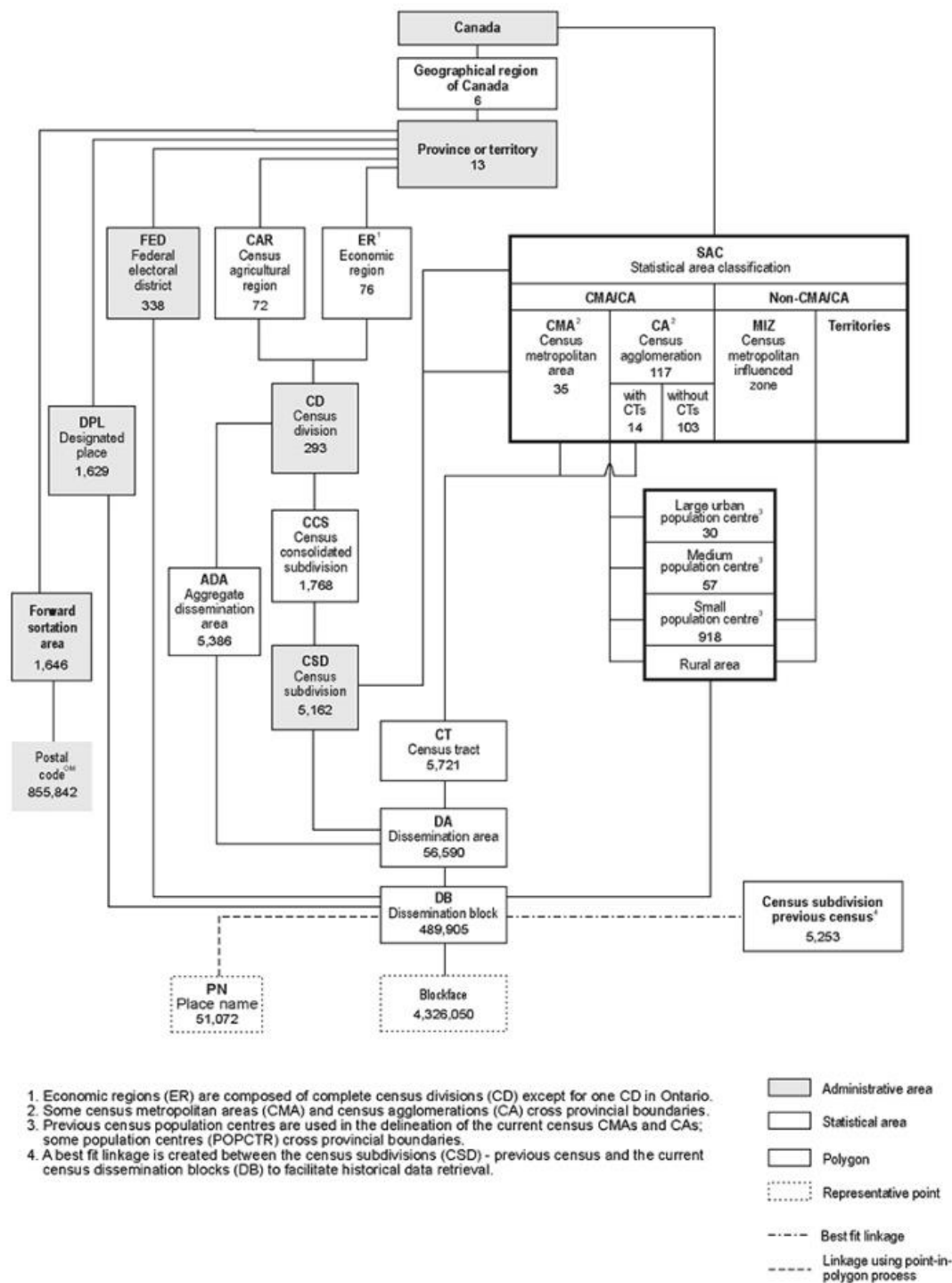
Figure 5 - Hierarchy of Canadian census data

Of these four, only "UBC Campus" has high-rise buildings actually within the high-density/high-family Dissemination Blocks—the others were just closely adjacent. The adjacent areas would be close enough to include a high-rise area and a selected dissemination block into a

single site, but this is not as compelling as having them overlap. Interestingly, one new site became apparent in this final evaluation that I had overlooked previously because it initially seemed to have only high-rise buildings (it also has townhomes). It is located to the West of the North side of the Cambie Street Bridge and I will call it "Coopers Mews," after the adjacent greenway. The dissemination block it sits within contains two high-rise buildings (surrounded by many more), several townhomes, and good public space. Its percentage of population age five to nine is in the top 13.6% of the region and its density is one of the highest in the city, so I added this site to my site list. These five sites are all excellent potential neighborhoods to study issues related to urban density and its relationship to sense of community among families with small children. Unfortunately, this latter selection process has three disadvantages: 1) It removed the "good and bad" public space dichotomy from the study, 2) it emphasizes the age 5 to 9 demographic at the expense of other-aged children (I had targeted the age 5 to 9 group for its need for semi-supervised outdoor play), and 3) it biases the study to favor areas in which families with children have either self-selected to live or in which state subsidies have encouraged such concentration.

To address these last concerns, I returned to my original list and looked for those sites that had a 'sufficient' number of families (based upon total counts of children aged 0 to 14 located in the combined dissemination areas associated with the sites—see appendix). The reason for the threshold was simply the pragmatic concern of being able to reach enough people that some of them might be willing to complete a survey. I arbitrarily set a number of 600 people (aged 0 to 14) as an acceptable threshold (based on the range I found among all sites). This limit returned the following sites (from the original list) as acceptable: "UBC Campus," "Sullivan Heights," "Port Moody," and "Coquitlam." It qualified two new sites, "Station Hill" and "McBride Ave.," that I had previously not selected due to having 'average' public space. "Vanness Ave.," "Univercity," and "East Ross Dr." were below my arbitrary threshold but still had relatively high population counts of children 0 to 14. This last selection process was limited in that it was biased in favor of high-family areas, though not as much as the previous process. Still, I believed this limitation was justified due to the pragmatic need to increase the odds of getting responses from my target demographic.

Despite this intensive and exhaustive selection process, ultimately, the sites selected were largely driven by the number of responses I was able to obtain from the sites I had chosen to study. Of my final selections, only UBC Campus and Port Moody (actually, a neighborhood in Port Moody different from the one I originally intended) delivered a sufficient number of survey responses and interviewees to be considered in the study. Since in-person outreach was all but impossible, most of my actual outreach took place via social media, leading to a much more dispersed sample.
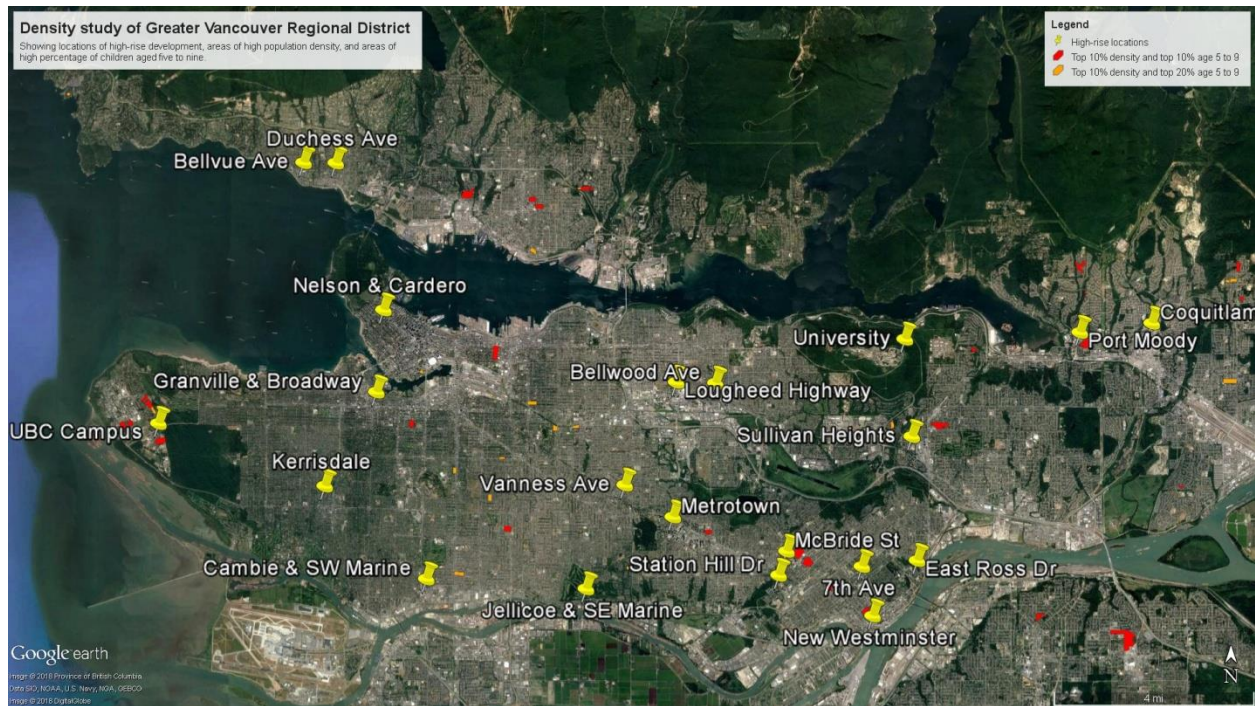
Figure 6 - Comparison of high-rise sites and areas of high density and high percentage of children aged 5 to 9

Appendix C: Advertising the survey

It was very challenging to get responses the survey for this study. I knew it would be. It was impossible to reach my primary target audience directly, namely, residents in high-rise buildings. They are securely isolated from solicitors, like me. Still, through a variety of means, I was able to obtain over 900 responses. I did not track how respondents heard of the study, so I don't know for certain which advertising techniques worked and which didn't. I think most of my responses were linked to social media (Facebook) posts and help from one property management company. If I were to do this study again (or any study that relied on reaching residents in high-rise or other secure housing), I would secure assistance from at least one property management company at the outset.

At the outset of the study, I listed all of my target sites and any means I could think of to reach residents in them. Table 1 below shows this summary.

SITE	**UBC Campus**
BOUNDARIES	Ross Dr, Gray Ave, Binning Rd, Pacific Spirit Park, Acadia Rd, University Blvd, NW Marine, 16th Ave
MAILING BOUNDARIES	N: University Blvd; W: NW Marine Dr.; S: SW Marine Dr.; E: Binning Rd/Acadia Rd.
CENTRAL INTERSECTION	W 16th @ Wesbrook Mall
TRANSIT STOP	W 16th @ Wesbrook Mall
ONLINE COMMUNITIES	https://www.facebook.com/groups/ubcfamilies/, https://www.facebook.com/groups/acadiapark/, https://www.facebook.com/groups/groupsatubc/
WEBSITES	http://www.discoverwesbrook.com/, http://vancouver.housing.ubc.ca/
COMMUNITY CENTERS	Acadia Park commonsblock, Old Barn community center, Wesbrook Village community center, Wesbrook welcome centre
LIBRARIES	4480 W 10th Ave
ELEMENTARY SCHOOLS	University Hill, Norma Rose
DAYCARES	UBC childcare services
BUILDINGS	
SITE	**Station Hill**
BOUNDARIES	Southridge Dr, BC Parkway, Byrne Creek Urban Trail, Byrnepark Dr
MAILING BOUNDARIES	N: Byrne Creek Urban Trail; W: Mission Urban Trail/Mission Ave.; S: BC Pkwy; E: BC Pkwy/Station Hill Dr.
CENTRAL INTERSECTION	Southpoint Ln @ Sandborne Ave
TRANSIT STOP	Griffiths Dr @ 18th Ave
ONLINE COMMUNITIES	https://www.facebook.com/northbnh/, https://www.facebook.com/BurnabyFamilyLife/, https://www.facebook.com/BurnabyECDCommunityTable/
WEBSITES	https://www.burnaby.ca/Assets/Neighbourhood+Associations+and+Business+Associations.pdf, https://www.bountycoop.com/about-us
COMMUNITY CENTERS	Hanna Court Children's Center, Talyor Park Children's Center

LIBRARIES	
ELEMENTARY SCHOOLS	Taylor Park
DAYCARES	Burnaby Children's Centres Society
BUILDINGS	The Belvedere, Villa Jardin, Savoy Carlton, Brambles housing co-op, Bounty housing co-op
SITE	**Edmonds St**
BOUNDARIES	Griffiths Ave, Kingsway Blvd, Edmonds St, Humphries Ave, Elwell St
MAILING BOUNDARIES	N: Elwell St.; W: Salisbury Ave.; S: Kingsway/Edmonds St.; E: Humphries Ave.
CENTRAL INTERSECTION	Kingsway Blvd @ Edmonds St
TRANSIT STOP	Griffiths Dr @ 18th Ave
ONLINE COMMUNITIES	
WEBSITES	https://www.epiccommunity.ca/home.html, https://burnabynh.ca/, https://kinaburnaby.org/, https://www.facebook.com/bbyedmonds/
COMMUNITY CENTERS	Edmonds community center, edmonds neighbourhood resource center
LIBRARIES	7311 Kingsway
ELEMENTARY SCHOOLS	Windsor, Ecole Brantford, Morley
DAYCARES	Little Feet child care daycare centre, growing minds child care centre
BUILDINGS	Esprit towers on Arcola, Emerson, Arcadia, Arcadia West
SITE	**Lougheed**
BOUNDARIES	Government St, Route 1, N Rd, Lougheed Hwy, Bartle Ct, Cameron St, Beaverbrook Cr, un-named trail
MAILING BOUNDARIES	N: Lougheed Hwy; W: Gaglardi Way; S: Trans-Canada Hwy; E: North Rd
CENTRAL INTERSECTION	Government St @ Lougheed Hwy
TRANSIT STOP	Government St @ Lougheed Hwy
ONLINE COMMUNITIES	https://www.facebook.com/ONA.Coq/
WEBSITES	https://funrecdaycamp.com/
COMMUNITY CENTERS	Cameron recreation complex
LIBRARIES	Burnaby Public library, Cameron branch
ELEMENTARY SCHOOLS	Cameron Elementary
DAYCARES	Three Bears daycare, Cameron Children's centre, Playcare Daycare, Cameron YMCA Kids Club, Rainforest Learning Centre Coquitlam
BUILDINGS	Strathmore Towers, The Harrington, Bel-Air, 115 Place
SITE	**Port Moody**
BOUNDARIES	Burrard Inlet, Murray St, Barnet Hwy, Falcon Dr, Guildford Way, Ungless

	Way, Ioco Rd
MAILING BOUNDARIES	N: Murray St.; W: Murray St.; S: Barnet Hwy; E: Ioco Rd.
CENTRAL INTERSECTION	Murray St @ Ioco Rd
TRANSIT STOP	Ioco Rd @ Barnett Hwy
ONLINE COMMUNITIES	http://www.portmoody.ca/index.aspx?page=1476, https://www.facebook.com/groups/1533431060254489/?ref=br_rs, https://www.facebook.com/groups/328217031026384/?ref=br_rs, https://www.facebook.com/groups/1507694412814471/?ref=br_rs, https://www.facebook.com/groups/1444860092435521/?ref=br_rs
WEBSITES	http://www.portmoody.ca, www.klahaniecommunity.com,
COMMUNITY CENTERS	Port Moody recreation complex & weight room
LIBRARIES	Port Moody public library
ELEMENTARY SCHOOLS	Eagle Ridge, Moody
DAYCARES	Busy Crododile Children's Centre, BrightPath St Johns, Shining Star Daycare, New Port Child Care Centre, Panda Bear Chldren's Place, New Port Child Care Center, Little Star Daycare, Kids & Company
BUILDINGS	
SITE	**Coquitlam**
BOUNDARIES	Johnson St, Atlantic Ave, Pinetree Way, Town Centre Blvd, Guildford Way
MAILING BOUNDARIES	N: Guildford Way; W: Westwood St.; S: Glen Dr.; E: Pipeline Rd.
CENTRAL INTERSECTION	Guildford Way @ Pinetree Way
TRANSIT STOP	Guildford Way @ Pinetree Way
ONLINE COMMUNITIES	https://www.facebook.com/groups/877062685746943/?ref=br_rs, https://www.facebook.com/groups/centralcoquitlamcommunitycorner/?ref=br_rs
WEBSITES	http://coquitlamkinsmen.com/, https://evergreenculturalcentre.ca/
COMMUNITY CENTERS	Pinetree community centre, Evergreen cultural centre, Douglas college
LIBRARIES	coquitlam city centre library
ELEMENTARY SCHOOLS	Glen, Walton, Nestor
DAYCARES	Glen Childcare Centre, Kidz R Kidz Learning Center, The Learning Circle Childcare Centre, Academics preKindergarten, BrightPath Port Coquitlam North
BUILDINGS	Parc Laurent, 3070 Guildford, Marlborough House, Westwood Place: The MacKenzie, The Cartier, The Selirk, The Hudson

Table 1 - Selected sites and potential advertising opportunities

Table 2, below, shows a journal of my actual outreach and the number of responses per month. I did not do any testing to infer whether responses were due to any particular type of outreach.

Activity log			
Month	Date	Action	Resp-onses
Nov. 2018			7
	3-Dec-18	posted on Acadia Park and UBC Families facebook pages	
		emailed Q.W. with flyers in Chinese	
		put flyers in Acadia Park lobbies and laundries, Wesbrook Village community center, and Old Barn community center (UBC Campus)	
		did online outreach to all known forums for all sites	
	5-Dec-18	visited sites in Station Hill, including	
		Talyor Park childrens center	
		Cortina apartment complex	
		Belgravia building	
		Winham court and Station Hill court apartment complexes	
		Mayfair Place buildings	
		visited sites in Edmonds St, including	
		Edmonds community Center (no flyer accepted)	
		Tommy Douglas Library	
		Edmonds Neighbourhood resource center	
	12-Dec-18	posted on Port Moody Community Corner facebook page	
		posted on Eagle Ridge facebook page	
		posted on Moody Centre Community Association facebook page	
		visited sites in Lougheed	
		Cameron childrens centre (worker said she would ask the manager)	
		Cameron library (did not allow posting)	
		Cameron recreation center (did not allow posting)	
		Emerald Manor high rise complex (3 buildings)--spoke with Saleem (from Fiji) who posted flyers in the management office	
		Barkley Woods apartment complex--spoke with B.who spoke at length and said he would ask strata council if ok to post flyers	
		Concorde Place said no posting	
	13-Dec-18	visited sites in Coquitlam, including	

		coquitlam library (large english, some small english and chinese)	
		coquitlam community center (lg english, sm english)	
		douglas college (will ask)	
		evergreen cultural center (no posting)	
		Hudson bldg on Pipeline rd (E)	
	*	1190 Pipeline (got contact info: info@pacific-dawn.com)	
		Glen Elementary--secretary M. to ask principle for permission (lg E, sm E, lg Ch, sm Ch)	
		Park Laraunt--manager Z. too lg E, lg Ch, some sm E & sm Ch	
	*	Lakeside Terrace--photographed contact info	
		port moody city council--sm E & sm Ch	
		port moody library--no board	
		port moody rec. centre--no board	
	*	400 Capilano--contact first service 855-273-1967, fsresidential.com	
	*	see also Gateway property management and Associa	
	*	canoe club klahanie--photographed contact info	
	*	651 nootka--photographed contact info	
	14-Dec-18	placed facebook ad to run for one month	
	30-Dec-18	reposted flyer on GNRL fb page and on facebook groups:	
		Acadia Park	
		UBC Families	
		Port Moody Discussion Group	
		Port Moody Community Corner	
		United Communities of Port Moody	
Dec. 2018			100
	2/3-Jan-19	Contacted property management companies to get strata manager email addresses	
	week of 1-Jan-19	emailed strata managers	
	12-Jan-19	emailed P.H. and B.G.	
	15-Jan-19	flyered Acadia Park high-rise and Point Grey apartment building, and Sopron House apt bldg	
	16-Jan-19	flyered Acadia Park townhomes	
	17-Jan-19	flyered remaining Acadia park townhomes, presidents row, and acadia house	
	17-Jan-	added traditional chinese and spanish options to survey	

	19		
	21-Jan-19	added Persian option	
	21-Jan-19	boosted post in facebook	
Jan.. 2019			142
	17-Feb-19	boosted post in facebook	
	17-Feb-19	began emailing planning academics	
Feb.. 2019			72
Mar. 2019			16
	4-Apr-19	emailed property managers	
Apr. 2019			4
	4-May-19	boosted post in facebook	
	16-May-19	**Associa to advertise my survey to its 500 properties**	
	25-May-19	boosted post in facebook	
	26-May-19	left flyers at port moody recreation center and coffee shop	
May 2019			169
June 2019			343
July 2019			28
Aug. 2019			29
Total			910

Table 2 - Survey advertising log and responses by month

This study used several techniques for advertising. The following are some of them.

Flyers

I used flyers for both physical posting (public bulletin boards) and online (on Facebook). Figure 1 is a flyer that was available in several languages, including Spanish, Farsi, and Traditional and Simplified Chinese. They were available at https://greatneighbourhood.sites.olt.ubc.ca/.

Figure 1 - 5"x7" flyer

Figure 2 - Letter-size flyer

Figure 3 –Flyer adapted for advertising by property management company Associa

Article

This (Figure 3) is an article I wrote that ran in a local newsletter in a target neighborhood.

THE CAMPUS RESIDENT

Published monthly by the University Neighbourhoods Association
#202-5923 Berton Avenue, Vancouver BC, V6S 0B3

EDITOR & BUSINESS MANAGER
JOHN TOMPKINS

DESIGN PRODUCTION
REBECCA IND

New Study Looks at Sense of Community in UBC Neighbourhoods

Eric Douglas
Acadia Park resident and PhD Candidate in UBC School of Community and Regional Planning

....

What makes some neighbourhoods great and some just places to pass through to get home? A new study at UBC is trying to find out.

The *Sense of Community* study (see great neighbourhood.ca), sponsored by UBC School of Community and Regional Planning, looks at residents' sense of community in high-density neighbourhoods. Previous studies have shown that high-density environments often create social stresses that may hamper residents' sense of community, but no published studies have looked at the direct relationship between high density environments and sense of neighbourhood community.

While urban density is a straightforward concept (how many people or dwelling units per area), sense of community can be trickier to define. Generally, sense of community relates to a person's affinity for a group of people. It implies a sense of belonging to, relating to, and contributing to a group and deriving some benefit from it. For examples, you might feel a sense of community toward people associated with your religion, your work, your sports team... Similarly, you might also think of the people in your neighbourhood as one of your communities.

Developers, architects, and city planners often take a special interest in trying to create neighbourhoods in which residents will feel a sense of community with their neighbours. Despite the challenge of forming a sense of community in a neighbourhood, there are many advantages to doing so.

One advantage is safety. Having friends and acquaintances in the neighbourhood means more friendly eyes on the street. Criminals like anonymity and hate visibility. When neighbours know each other, it is harder for criminals to act with impunity. Also, if there is an emergency, it is good to know that there are people nearby you can feel comfortable going to for help.

A second advantage is convenience. Sometimes, you just need to borrow a cup of sugar or have someone watch your kids for a few minutes. As long as you don't mind a little give and take, having trusted neighbours can mean the difference between a finished pie and a long trip to the grocery store.

Third, there are the social benefits of having friends and acquaintances near your home. Humans are social creatures, so there is an advantage to living in a neighbourhood in which you greet your neighbours and occasionally stop to chat with them. While it's true that some people would just like to be left alone, most people enjoy coming home to a friendly neighbourhood, just as they enjoy coming home to a peaceful house.

Finally, several studies have pointed to the mental and emotional health benefits of having a strong sense of community. While these benefits may accrue from various types of communities, there is an advantage to having this sense of community within our own neighbourhoods. If we can gain mental and emotional benefits from our own neighbourhood community, we're more likely to do so than if we have to travel far for them.

So, what is so great about having a strong sense of neighbourhood community? It makes our lives safer, easier, friendlier, and healthier. In fact, many would agree that a healthy sense of community is a fundamental part of what makes a neighbourhood great. For those of us who live on campus, this issue is highly relevant as UBC makes plans to develop the Stadium Neighbourhood and, soon after, Acadia East. Unfortunately, there's still a lot we don't know about what kinds of infrastructure – both 'hard' infrastructure (parks, open spaces, community centers, etc.) and 'soft' infrastructure (neighbourhood associations, events, newsletters, etc.) – help strengthen residents' sense of neighbourhood community.

Please go to greatneighbourhood.ca today and take the *Sense of Community* survey. Help us learn how to make both existing neighbourhoods and new neighbourhoods at UBC places where we love to live – great neighbourhoods with a great sense of community!

Figure 3 – Article in local neighborhood newsletter at UBC

Emails

I used emails extensively for outreach. Here are two examples.

Template for outreach email to strata managers:

> subject: UBC study involving _____
>
> Hello _____,
>
> I am a researcher at the University of British Columbia. I am managing the Sense of Community Study that includes the property at _____. I'm reaching out to you because I think this study may be of interest to you and your strata council.
>
> ### What is this study about?
>
> The Sense of Community Study looks at residents' sense of community in a few neighbourhoods in the Greater Vancouver Regional District that have a mix of medium and high density areas. It looks at the effects of several factors on sense of community, including density, safety, housing type, and availability of public space. You can learn more about this study at greatneighbourhood.ca/about.
>
> ### How will this study benefit your strata?
>
> I would like to offer your strata a summary of the results of the Sense of Community Study when it is complete. I expect the results to address questions such as
>   - What can a strata do to improve sense of community among residents?
>   - What factors may cause residents to feel crowded?
>   - Does fear of crime tend to prevent residents from connecting with their neighbours?
>   - What kind of public space makes neighbourhoods more appealing to residents?
>   - How can neighbourhood associations make neighbourhoods more desirable places to live?
>
> If you think that the answers to questions like these would benefit you or your fellow strata council members, please let me know and I will add you to my list of summary recipients.
>
> ### What am I asking for?
>
> One of the challenges of this study is making it known to the residents in the neighbourhoods under consideration. A primary source of data for the study is the Sense of Community Survey found at greatneighbourhood.ca (the survey takes about 15 minutes). If you have a way to share this link with the residents associated with your strata, it would be very helpful to the study. The link could be shared in a newsletter, on a bulletin board (I can provide a flyer), forwarded to a neighbourhood association, shared on a neighbourhood social media site, or made available by some other means of communication that you find appropriate.
>
> The more residents from your strata that chose to participate, the more the results will reflect the conditions of your particular neighbourhood. Of course, participation is completely voluntary and no personal information will ever be made public. (This study is fully compliant with the UBC Office of Research Ethics.)
>
> If you would like to receive the summary results of this research project, would be willing to help make the study known to the residents of your building, or would like to know more about this study, please contact me at your convenience.
>
> Thanks for your time and attention to this matter.
>
> Best regards,
> Eric

Template for outreach email to property managers:

> subject: The Great Neighbourhood Initiative - an opportunity to work together to make our neighbourhoods better
>
> Hello,
>
> Please allow me to introduce you to the Great Neighbourhood Initiative. The purpose of this initiative is to find ways to improve residents' quality of life in dense urban neighbourhoods. Our current focus is on understanding the relationship between urban density and sense of community.
>
> To gather data, we are using an online survey at greatneighbourhood.ca. We are reaching out to real estate developers and property managers to help us make this survey available to residents in the Greater Vancouver Regional District. In exchange, we will be happy to share with you a summary of our findings.
>
> We believe many developers and property managers would like to add value to their projects and distinguish themselves by providing, not just great homes, but great communities as well. We feel a key ingredient to doing this is understanding what it takes to build neighbourhoods that foster a great sense of community. But, we need your help. If you can spare a moment, please post the attached flyer online or on bulletin boards of properties you manage (flyers in other languages are available on our ambassador page).
>
> If you would like a summary of our findings, please let me know by replying to this email and I will add you to our list of recipients. To get a sense of the data we are collecting, please take the survey yourself! All of the questions are optional and we will never share any personal data. You can see the full document of consent available to survey participants here and a brief description of the study is available here.
>
> The Great Neighbourhood Research Lab is sponsored by the School of Community and Regional Planning at the University of British Columbia. We look forward to hearing from you and thank you very much for your attention!
>
> Best Regards,
> Eric

Online posts

I made several online posts, including some paid advertising spots. A typical post was like this:

> Sense of community survey:
> Hello, I'm a PhD student at the University of British Columbia. I'm studying sense of community in neighbourhoods throughout the Greater Vancouver Regional District and I'm looking for participants to fill out a brief survey (which includes a draw for $25). Please share your thoughts and help us learn how to make our neighbourhoods better. Go to greatneighbourhood.ca and follow the link. Thanks for letting my post on your forum!

Website

I made several posts on a website I set up to advertise my survey, greatneighbourhood.ca. I would link to these posts on a Facebook page I set up for the survey (facebook.com/greatneighbourhood) and in neighborhood Facebook group pages.

Appendix D: Survey questions

Start of Block: Introduction

Q1.1

Thank you for taking time to complete this survey. Your answers will help architects, planners, and developers create better neighbourhoods where people feel at home and have a strong sense of community.

 All questions are optional, but they all help us understand how people form a sense of community in their neighbourhood, so please answer all questions you feel comfortable answering. Your answers will remain anonymous, but you will have the option to leave your contact information if you would like to be considered for a gift card drawing (even if you don't complete the survey) or if you are willing to participate in a follow-up interview. (If you continue with this survey, it means you understand and agree to these terms.)

 This survey should take about fifteen minutes.

You can learn more about this research at greatneighbourhood.ca and you can read a detailed consent form on the next screen or by clicking here.

Q1.2 **Documentation of consent**

Consent Form for study titled "How does residential density relate to residents' sense of community?"
 Principal Investigator: Maged Senbel
 Project manager: Eric Douglas
 Institution: University of British Columbia, School of Community and Regional Planning
Sponsor: None
 Purpose:
 The Greater Vancouver Regional District is under pressure to provide sufficient housing. One response to this pressure has been to allow greater building and neighborhood densities in many areas. Unfortunately, increased density may, in turn, bring about other societal pressures that may diminish residents' perception of their neighborhoods. For example, increased density may result in a lack of public space for socialization, which may lead to less informal socializing among neighbors and a decrease in sense of community. This study investigates the relationship between density and sense of community.
 Study Procedures:
 This study offers two levels of commitment. The first is an opportunity to complete an online survey. The time commitment for the survey is 10 to 20 minutes. The second level is participation in an individual interview. Survey respondents will have an opportunity to volunteer to be interviewed by leaving their contact information at the end of the survey. The time commitment for the interview is 1/2 to 1 hour. The discussion will be recorded and transcribed. Names and personally identifiable information will not be published.
 Project Outcomes:

The data generated by this research will be used to inform a PhD thesis.

Potential Benefits:

There are no direct benefits to you for participating in this study aside from the small compensation offered.

Potential Risks:

This study deals with relationships among neighbors. As such, you may be asked to comment on relationships or conditions that you feel are problematic. You do not have to answer any of the questions posed in any phase of this study. You may skip any question in the survey. If you do not wish to answer a question in a personal interview, you may simply say something like, "I'd like to skip that question."

Confidentiality:

You will not be identified by name in either the recording or the interview transcript. Participants will not be identified by name in any reports of the completed study.

Remuneration/Compensation:

In order to acknowledge the time you have taken to be involved in this project, you will receive the following compensation for participation:

Survey: Option to enter a draw for one of four $25 gift cards (survey completion not required).

Personal interview: $10 honorarium for participation.

Contact for information about the study:

Eric Douglas,

Contact for concerns or complaints about the study:

If you have any concerns or complaints about your rights as a research participant, and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598, or, if long distance e-mail to RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

Consent:

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time. By completing this survey, you are consenting to participate in this study.

Start of Block: Block 1 {demographic information}

Q2.1 What is your postal code?

Q2.2 In what year were you born?

Q2.3 What is your gender?
Male (4)
Female (5)
Other (6) _____

Q2.4 How many people are in your household?

Q2.5 How many children live with you?

Q2.6 If you have children, what are their ages?
Child 1 (4) _____

Child 2 (5) _____
Child 3 (6) _____
Child 4 (7) _____
Child 5 (8) _____
Child 6 (9) _____

Q2.7 Do you rent or own your home?
Rent (1)
Own (2)

Q2.8 What is your annual household income?
Less than $25,000 (1)
$25,000 - $49,999 (2)
$50,000 - $74,999 (3)
$75,000 - $99,999 (4)
More than $100,000 (5)

Q2.9 How much is your monthly rent or mortgage?
Less than $1,000 (1)
$1,000 - $1,499 (2)
$1,500 - $1,999 (3)
$2,000 - $2,499 (4)
$2,500 - $2,999 (5)
$3,000 - $3,499 (6)
$3,500 - $3,999 (7)
More than $4,000 (8)

Q2.10 With what ethnicity/culture do you identify?

Q2.11 What is your first language?

Q2.12 To which communities *outside* of your neighbourhood do you feel connected?
Family (1)
Co-workers/school friends (2)
Religious group (3)
Political group (4)
Sports/hobby group (5)
Online community (6)
Other (please describe here) (7)

Q2.13 How long have you lived at your current address?
Less than 1 year (6)
Between 1 and 3 years (5)
Between 3 and 6 years (4)
Between 6 and 10 years (3)
Between 10 and 15 years (2)
More than 15 years (1)

Q2.14 Where did you live previously?

Start of Block: Block 2 {sense of community}

Q3.1 **To what extent to you agree with the following statements?**

	Strongly agree (13)	Somewh at agree (14)	Neither agree nor disagree (15)	Somewh at disagree (16)	Strongly disagree (17)
It is important to me to feel a sense of community in my neighbourhood. (1)					
I think my neighbourhood is a good place for me to live. (2)					
People in this neighbourhood share the same values. (3)					
My neighbours and I want the same things from the neighbourhood. (4)					
I can recognize many of the people who live in my neighbourhood. (5)					
I feel at home in this neighbourhood. (6)					
Many of my neighbours know me. (7)					
I care about what my neighbours think of my actions. (8)					
I can influence what this neighbourhood is like. (9)					
If there is a problem in this neighbourhood, people who live here can get it solved. (10)					
It is very important to me to live in this particular neighbourhood. (11)					
People in this neighbourhood generally get along with each other. (12)					
I would prefer to live in this neighbourhood for a long time. (13)					
My neighbours are a lot like me. (14)					
It's easy for me to fit in with my neighbours. (15)					
I'm glad that I live in my neighbourhood. (16)					

I feel a sense of connection with many of my neighbours. (17)

I belong in my neighbourhood. (18)

I have neighbours I can chat with when I want to. (19)

I have friends in my neighbourhood. (20)

If I need to borrow something, I don't mind asking my neighbours for it. (21)

If I have an emergency, my neighbours will help me. (22)

If my neighbours and I want to improve our neighbourhood, we can. (23)

I feel comfortable being around my neighbours. (24)

I feel comfortable walking around my neighbourhood. (25)

If I lost my wallet in my neighbourhood, I would probably get it back. (26)

Q3.2

	More than 15 (1)	11 - 15 (2)	6 - 10 (3)	1 - 5 (4)	None (5)
How many of your neighbours do you know by name? (1)					
From how many of your neighbours would you feel comfortable borrowing a cup of sugar? (2)					
If you had an emergency, to how many of your neighbours could turn for help? (3)					
How many of your neighbours do you consider friends? (4)					
How many of your neighbours would you feel comfortable asking to care for your home while you were away on vacation? (5)					

Start of Block: Block 3 {amenities, public space, and housing type}

Q4.1 **About how often do you use the following spaces *in your neighbourhood*?**

	Never (1)	Annually (2)	Monthly (3)	Weekly (4)	Daily (5)
A building common space (lobby, corridor, elevator, etc.) (10)					
A walkway (9)					
A park (1)					
A playground (2)					
A community center (3)					
A cafe (4)					
A grocery store (5)					
A store other than for groceries (6)					
Other (please describe) (8)					

Q4.2 **About how often do you speak with any of your neighbours in the following spaces *in your neighbourhood*?**

	Never (1)	Annually (2)	Monthly (3)	Weekly (4)	Daily (5)
A building common space (lobby, corridor, elevator, etc.) (10)					
A walkway (9)					
A park (1)					
A playground (2)					
A community center (3)					
A cafe (4)					
A grocery store (5)					
A store other than for groceries (6)					
Other (please describe) (8)					

Q4.3 **In what type of housing do you live?**
A detached single-family house (1)
A low-rise attached house (such as a duplex, tri-plex, four-plex, townhouse, or row house) (2)
A low-rise apartment building (up to five stories high) (3)
A high-rise apartment building (over five stories high) (4)
Other (please describe here) (5)

Q4.4 **Does your neighbourhood have a neighbourhood association?**
Yes (1)
No (2)

Don't know (3)

Skip To: End of Block If Does your neighbourhood have a neighbourhood association? != Yes

Q4.5 **Are you involved with your neighbourhood association in any way?**
Yes (1)
No (2)
Don't know (3)

Start of Block: Block 4 {perceived density}

Q5.1 **In your neighbourhood,...**

	Never (1)	Seldom (2)	Someti mes (3)	Often (4)	Always (5)
how often do you feel you do not have enough privacy? (1)					
how often do you feel annoyed, bothered, or disturbed by the noise or activity of your neighbours? (2)					
how often do you feel overwhelmed because you come into contact with too many people? (3)					
how often do you come into contact with people you would rather avoid? (4)					
how often do you go out of your way to avoid interacting with your neighbours? (5)					
how often do you feel angry because people in your neighbourhood don't leave you alone? (6)					
how often do you wish you had a place in your neighbourhood where you could be alone? (14)					
how often do you feel you live in a crowded environment? (15)					

Start of Block: Block 5 {perception of neighborhood}

Q6.1 **To what extent to you agree with the following statements?**

	Strongly agree (11)	Some what agree (12)	Neither agree nor disagree (13)	Somewhat disagree (14)	Strongly disagree (15)
My neighbourhood is not safe. (1)					
My building is not safe. (2)					
I am afraid to walk in my neighbourhood at night. (3)					

I am afraid that I could be attacked or harmed in my building. (4)

I think parents should not feel comfortable letting their young children play in this neighbourhood with minimal supervision. (5)

I worry about my personal property being damaged or stolen in this neighbourhood. (6)

I worry about my personal safety in this neighbourhood. (7)

I think I would feel safer if I moved to a different neighbourhood. (8)

Start of Block: Block 6 {past housing experience}

Q7.1 *In your previous home,* **in what kind of building did you live?**
A detached single-family house (1)
A low-rise attached house (such as a duplex, tri-plex, four-plex, townhouse, or row house) (2)
A low-rise apartment building (up to five stories high) (3)
A high-rise apartment building (over five stories high) (4)
Other (please describe here) (5)

Q7.2 **During your life, in what kind of building have you lived** *most often***?**
A detached single-family house (1)
A low-rise attached house (such as a duplex, tri-plex, four-plex, townhouse, or row house) (2)
A low-rise apartment building (up to five stories high) (3)
A high-rise apartment building (over five stories high) (4)
Other (please describe here) (5)

Q7.3 *In your previous neighbourhood,* **about how often did you typically speak with one of your neighbours in the following spaces?**

	Never (1)	Annually (2)	Monthly (3)	Weekly (4)	Daily (5)
A building common space (lobby, corridor, elevator, etc.) (10)					
A walkway (9)					
A park (1)					
A playground (2)					
A community center (3)					
A cafe (4)					
A grocery store (5)					
A store other than for groceries (6)					

Other (please describe) (8)

Q7.4 *Compared to your previous neighbourhood,...*

	Much more (18)	Somew hat more (19)	About the same (20)	Somewh at less (21)	Much less (22)
how safe is your current neighbourhood? (1)					
how crowded is your current neighbourhood? (2)					
how much of a sense of community do you feel in your current neighbourhood? (3)					
how important is it to you to feel a sense of community in your current neighbourhood? (4)					

Start of Block: Block 7

Q8.1 What is one thing that would make your neighbourhood better?

Q8.2 What is one thing that would make would make you feel a stronger sense of community in your neighbourhood?

Q8.3 If you would like to enter to win one of four $25 gift cards, please enter your contact information here.

Q8.4 If you would like to be considered for a half-hour to one-hour interview discussing sense of community, please enter your contact information here. A $10 honorarium will be provided to interviewees.

Appendix E: Survey variables

Category	Question number	Question	Response type	Data type	Response 1	Response 2	Response 3	Response 4	Response 5	Response 6	Response 7	Response 8
												Responses
		Duration (in seconds)	auto									
		Recorded Date	auto									
		Response ID	auto									
		User Language	auto									
	Density	Census density	calculated									
	Density-Z*SOC-Z	product of Z-scores for Density and SOC	calculated									
	PCODE	corrected postal codes	adjusted									
demographic information	Q2.1	What is your postal (zip) code?	text									
	Q2.2	In what year were you born?	text	ratio								
	Q2.3	What is your gender? - Selected Choice	choice	nominal	1 = male	2 = female	3 = other					
	Q2.3_6_TEXT	What is your gender? - Other - Text	text									
	Q2.4	How many people are in your household?	text	ratio								
	Q2.5	How many children live with you?	text	ratio								
	Q2.6_1	If you have children, what are their ages? - Child 1	text									
	Q2.6_2	If you have children, what are their ages? - Child 2	text									
	Q2.6_3	If you have children, what are their ages? - Child 3	text									
	Q2.6_4	If you have children, what are their ages? - Child 4	text									
	Q2.6_5	If you have children, what are their ages? - Child 5	text									
	Q2.6_6	If you have children, what are their ages? - Child 6	text									
	Q2.6_Calc	Has children aged 5-9	calculated	nominal	1 = yes	2 = no						
	Q2.7	Do you rent or own your home?	choice	nominal	1 = rent	2 = own						

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ID	Question	Type	Scale	Opt1	Opt2	Opt3	Opt4	Opt5	Opt6	Opt7	Opt8
Q2.8	What is your annual household income?	choice	ordinal	1 = Less than $25,000	2 = $25,000 - $49,999	3 = $50,000 - $74,999	4 = $75,000 - $99,999	5 = More than $100,000			
Q2.9	How much is your monthly rent or mortgage?	choice	ordinal	1 = Less than $1,000	2 = $1,000 - $1,499	3 = $1,500 - $1,999	4 = $2,000 - $2,499	5 = $2,500 - $2,999	6 = $3,000 - $3,499	7 = $3,500 - $3,999	8 = More than $4,000
Q2.10	With what ethnicity/culture do you identify?	text									
Q2.11	What is your first language?	text									
Q2.12	To which communities outside of your neighbourhood do you feel connected? - Selected Choice	choice	nominal	1 = Family	2 = Co-workers/school friends	3 = Religious group	4 = Political group	5 = Sports/hobby group	6 = Online community	7 = Other (please describe here)	
Q2.12_1	To which communities outside of your neighbourhood do you feel connected? - Family	calculated	nominal	1 = yes	2 = no						
Q2.12_2	To which communities outside of your neighbourhood do you feel connected? - Co-workers/school friends	calculated	nominal	1 = yes	2 = no						
Q2.12_3	To which communities outside of your neighbourhood do you feel connected? - Religious group	calculated	nominal	1 = yes	2 = no						
Q2.12_4	To which communities outside of your neighbourhood do you feel connected? - Political group	calculated	nominal	1 = yes	2 = no						
Q2.12_5	To which communities outside of your neighbourhood do you feel connected? - Sports/hobby group	calculated	nominal	1 = yes	2 = no						
Q2.12_6	To which communities outside of your neighbourhood do you feel connected? - Online community	calculated	nominal	1 = yes	2 = no						
Q2.12_7_TEXT	To which communities outside of your neighbourhood do you feel connected? - Other (please describe here) - Text	text									
Q2.13	How long have you lived at your current address?	choice	ordinal	1 = More than 15 years	2 = Between 10 and 15 years	3 = Between 6 and 10 years	4 = Between 3 and 6 years	5 = Between 1 and 3 years	6 = Less than 1 year		
Q2.14	Where did you live previously?	text									

					1 = Strongly agree	2 = Somewhat agree	3 = Neither agree nor disagree	4 = Somewhat disagree	5 = Strongly disagree			
sense of community	Q3.1_1	To what extent to you agree with the following statements? - It is important to me to feel a sense of community in my neighbourhood.	choice	ordinal								
	Q3.1_2	To what extent to you agree with the following statements? - I think my neighbourhood is a good place for me to live.	choice	ordinal								
	Q3.1_3	To what extent to you agree with the following statements? - People in this neighbourhood share the same values.	choice	ordinal								
	Q3.1_4	To what extent to you agree with the following statements? - My neighbours and I want the same things from the neighbourhood.	choice	ordinal								
	Q3.1_5	To what extent to you agree with the following statements? - I can recognize many of the people who live in my neighbourhood.	choice	ordinal								
	Q3.1_6	To what extent to you agree with the following statements? - I feel at home in this neighbourhood.	choice	ordinal								
	Q3.1_7	To what extent to you agree with the following statements? - Many of my neighbours know me.	choice	ordinal								
	Q3.1_8	To what extent to you agree with the following statements? - I care about what my neighbours think of my actions.	choice	ordinal								
	Q3.1_9	To what extent to you agree with the following statements? - I can influence what this neighbourhood is like.	choice	ordinal								
	Q3.1_10	To what extent to you agree with the following statements? - If there is a problem in this neighbourhood, people who live here can get it solved.	choice	ordinal								
	Q3.1_11	To what extent to you agree with the following statements? - It is very important to me to live in this particular neighbourhood.	choice	ordinal								
	Q3.1_12	To what extent to you agree with the following statements? - People in this neighbourhood generally get along with each other.	choice	ordinal								
	Q3.1_13	To what extent to you agree with the following statements? - I would prefer to live in this neighbourhood for a long time.	choice	ordinal								
	Q3.1_14	To what extent to you agree with the following statements? - My neighbours are a lot like me.	choice	ordinal								

				1 = More than 15	2 = 11 - 15	3 = 6 - 10	4 = 1 - 5	5 = None			
Q3.1_15	To what extent to you agree with the following statements? - It's easy for me to fit in with my neighbours.	choice	ordinal								
Q3.1_16	To what extent to you agree with the following statements? - I'm glad that I live in my neighbourhood.	choice	ordinal								
Q3.1_17	To what extent to you agree with the following statements? - I feel a sense of connection with many of my neighbours.	choice	ordinal								
Q3.1_18	To what extent to you agree with the following statements? - I belong in my neighbourhood.	choice	ordinal								
Q3.1_19	To what extent to you agree with the following statements? - I have neighbours I can chat with when I want to.	choice	ordinal								
Q3.1_20	To what extent to you agree with the following statements? - I have friends in my neighbourhood.	choice	ordinal								
Q3.1_21	To what extent to you agree with the following statements? - If I need to borrow something, I don't mind asking my neighbours for it.	choice	ordinal								
Q3.1_22	To what extent to you agree with the following statements? - If I have an emergency, my neighbours will help me.	choice	ordinal								
Q3.1_23	To what extent to you agree with the following statements? - If my neighbours and I want to improve our neighbourhood, we can.	choice	ordinal								
Q3.1_24	To what extent to you agree with the following statements? - I feel comfortable being around my neighbours.	choice	ordinal								
Q3.1_25	To what extent to you agree with the following statements? - I feel comfortable walking around my neighbourhood.	choice	ordinal								
Q3.1_26	To what extent to you agree with the following statements? - If I lost my wallet in my neighbourhood, I would probably get it back.	choice	ordinal								
Q3.1_Calc		calculated (average of Q3.1_1									
Q3.2_1	Please answer the following questions about how well you know your neighbours. - How many of your neighbours do you know by name?	choice	ordinal	1 = More than 15	2 = 11 - 15	3 = 6 - 10	4 = 1 - 5	5 = None			

					1	2	3	4	5			
	Q3.2_2	Please answer the following questions about how well you know your neighbours. - From how many of your neighbours would you feel comfortable borrowing a cup of sugar?	choice	ordinal	1 = More than 15	2 = 11 - 15	3 = 6 - 10	4 = 1 - 5	5 = None			
	Q3.2_3	Please answer the following questions about how well you know your neighbours. - If you had an emergency, to how many of your neighbours could turn for help?	choice	ordinal	1 = More than 15	2 = 11 - 15	3 = 6 - 10	4 = 1 - 5	5 = None			
	Q3.2_4	Please answer the following questions about how well you know your neighbours. - How many of your neighbours do you consider friends?	choice	ordinal	1 = More than 15	2 = 11 - 15	3 = 6 - 10	4 = 1 - 5	5 = None			
	Q3.2_5	Please answer the following questions about how well you know your neighbours. - How many of your neighbours would you feel comfortable asking to care for your home while you were away on vacation?	choice	ordinal	1 = More than 15	2 = 11 - 15	3 = 6 - 10	4 = 1 - 5	5 = None			
amenities, public space, and housing type	Q4.1_1	About how often do you use the following spaces in your neighbourhood? - A building common space (lobby, corridor, elevator, etc.)	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
	Q4.1_2	About how often do you use the following spaces in your neighbourhood? - A walkway	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
	Q4.1_3	About how often do you use the following spaces in your neighbourhood? - A park	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
	Q4.1_4	About how often do you use the following spaces in your neighbourhood? - A playground	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
	Q4.1_5	About how often do you use the following spaces in your neighbourhood? - A community center	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
	Q4.1_6	About how often do you use the following spaces in your neighbourhood? - A cafe	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			

				1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.1_7	About how often do you use the following spaces in your neighbourhood? - A grocery store	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.1_8	About how often do you use the following spaces in your neighbourhood? - A store other than for groceries	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.1_9	About how often do you use the following spaces in your neighbourhood? - Other (please describe)	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.1_9 _TEXT	About how often do you use the following spaces in your neighbourhood? - Other (please describe) - Text	text									
Q4.2_1	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A building common space (lobby, corridor, elevator, etc.)	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.2_2	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A walkway	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.2_3	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A park	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.2_4	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A playground	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.2_5	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A community center	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.2_6	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A cafe	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q4.2_7	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A grocery store	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			

	ID	Question	Type	Scale									
	Q4.2_8	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - A store other than for groceries	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily				
	Q4.2_9	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - Other (please describe)	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily				
	Q4.2_9 _TEXT	About how often do you speak with any of your neighbours in the following spaces in your neighbourhood? - Other (please describe) - Text	text										
	Q4.3	In what type of housing do you live? - Selected Choice	choice	nominal	1 = A detached single-family house	2 = A low-rise attached house (such as a duplex, tri-plex, four-plex, townhouse, or row house)	3 = A low-rise apartment building (up to five stories high)	4 = A high-rise apartment building (over five stories high)	5 = Other (please describe here)				
	Q4.3_1	In what type of housing do you live? - A detached single-family house	calculated	nominal	1 = yes	2 = no							
	Q4.3_2	In what type of housing do you live? - A low-rise attached house	calculated	nominal	1 = yes	2 = no							
	Q4.3_3	In what type of housing do you live? - A low-rise apartment building	calculated	nominal	1 = yes	2 = no							
	Q4.3_4	In what type of housing do you live? - A high-rise apartment building	calculated	nominal	1 = yes	2 = no							
	Q4.3_5 _TEXT	In what type of housing do you live? - Other (please describe here) - Text	text										
	Q4.4	Does your neighbourhood have a neighbourhood association?	choice	nominal	1 = yes	2 = no							
	Q4.5	Are you involved with your neighbourhood association in any way?	choice	nominal	1 = yes	2 = no							
perceived density	Q5.1_1	In your neighbourhood,... - how often do you feel you do not have enough privacy?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always				

	Q5.1_2	In your neighbourhood,... - how often do you feel annoyed, bothered, or disturbed by the noise or activity of your neighbours?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_3	In your neighbourhood,... - how often do you feel overwhelmed because you come into contact with too many people?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_4	In your neighbourhood,... - how often do you come into contact with people you would rather avoid?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_5	In your neighbourhood,... - how often do you go out of your way to avoid interacting with your neighbours?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_6	In your neighbourhood,... - how often do you feel angry because people in your neighbourhood don't leave you alone?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_7	In your neighbourhood,... - how often do you wish you had a place in your neighbourhood where you could be alone?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_8	In your neighbourhood,... - how often do you feel you live in a crowded environment?	choice	ordinal	1 = Never	2 = Seldom	3 = Sometimes	4 = Often	5 = Always			
	Q5.1_C alc		calculated (average of Q5.1_1									
perception of neighborhood	Q6.1_1	To what extent do you agree with the following statements? - My neighbourhood is not safe.	choice	ordinal	1 = Strongly agree	2 = Somewhat agree	3 = Neither agree nor disagree	4 = Somewhat disagree	5 = Strongly disagree			
	Q6.1_2	To what extent do you agree with the following statements? - My building is not safe.	choice	ordinal	1 = Strongly agree	2 = Somewhat agree	3 = Neither agree nor disagree	4 = Somewhat disagree	5 = Strongly disagree			
	Q6.1_3	To what extent do you agree with the following statements? - I am afraid to walk in my neighbourhood at night.	choice	ordinal	1 = Strongly agree	2 = Somewhat agree	3 = Neither agree nor disagree	4 = Somewhat disagree	5 = Strongly disagree			

						1 = A detached single-family house	2 = A low-rise attached house (such as a duplex, tri-plex, four-plex, townhouse, or row house)	3 = A low-rise apartment building (up to five stories high)	4 = A high-rise apartment building (over five stories high)	5 = Other (please describe here)			
	Q6.1_4	To what extent do you agree with the following statements? - I am afraid that I could be attacked or harmed in my building.	choice	ordinal									
	Q6.1_5	To what extent do you agree with the following statements? - I think parents should not feel comfortable letting their young children play in this neighbourhood with minimal supervision.	choice	ordinal									
	Q6.1_6	To what extent do you agree with the following statements? - I worry about my personal property being damaged or stolen in this neighbourhood.	choice	ordinal									
	Q6.1_7	To what extent do you agree with the following statements? - I worry about my personal safety in this neighbourhood.	choice	ordinal									
	Q6.1_8	To what extent do you agree with the following statements? - I think I would feel safer if I moved to a different neighbourhood.	choice	ordinal									
	Q6.1_Calc		calculated (average of Q6.1_1										
past housing experience	Q7.1	In your previous home, in what kind of building did you live? - Selected Choice	choice	nominal									
	Q7.1_5_TEXT	In your previous home, in what kind of building did you live? - Other (please describe here) - Text	text										

				1 = A detached single-family house	2 = A low-rise attached house (such as a duplex, tri-plex, four-plex, townhouse, or row house)	3 = A low-rise apartment building (up to five stories high)	4 = A high-rise apartment building (over five stories high)	5 = Other (please describe here)			
Q7.2	During your life, in what kind of building have you lived most often? - Selected Choice	choice	nominal								
Q7.2_5_TEXT	During your life, in what kind of building have you lived most often? - Other (please describe here) - Text	text									
Q7.3_1	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A building common space (lobby, corridor, elevator, etc.)	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q7.3_2	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A walkway	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q7.3_3	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A park	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q7.3_4	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A playground	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q7.3_5	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A community center	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q7.3_6	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A cafe	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			
Q7.3_7	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A grocery store	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily			

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Q7.3_8	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - A store other than for groceries	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily				
Q7.3_9	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - Other (please describe)	choice	ordinal	1 = Never	2 = Annually	3 = Monthly	4 = Weekly	5 = Daily				
Q7.3_9 _TEXT	In your previous neighbourhood, about how often did you typically speak with one of your neighbours in the following spaces? - Other (please describe) - Text	text										
Q7.4_1	Compared to your previous neighbourhood,... - how safe is your current neighbourhood?	choice	ordinal	1 = Much more	2 = Somewhat	3 = About the same	4 = Somewhat	5 = Much less				
Q7.4_2	Compared to your previous neighbourhood,... - how crowded is your current neighbourhood?	choice	ordinal	1 = Much more	2 = Somewhat	3 = About the same	4 = Somewhat	5 = Much less				
Q7.4_3	Compared to your previous neighbourhood,... - how much of a sense of community do you feel in your current neighbourhood?	choice	ordinal	1 = Much more	2 = Somewhat	3 = About the same	4 = Somewhat	5 = Much less				
Q7.4_4	Compared to your previous neighbourhood,... - how important is it to you to feel a sense of community in your current neighbourhood?	choice	ordinal	1 = Much more	2 = Somewhat	3 = About the same	4 = Somewhat	5 = Much less				
Q8.1	What is one thing that would make your neighbourhood better?	text										
Q8.2	What is one thing that would make would make you feel a stronger sense of community in your neighbourhood?	text										
Q8.3	If you would like to enter to win one of four $25 gift cards, please enter your contact information here.	text										
Q8.4	If you would like to be considered for a half-hour to one-hour interview discussing sense of community, please enter your contact information here. A $10 honorarium will be provided to interviewees.	text										

Appendix F: Interview questions

Thank you for offering to share your thoughts with us for the Great Neighbourhood Research Lab's Sense of Neighbourhood Community Study! The purpose of this document is to show you the questions we will use during our interview with you. All questions are optional, but all are useful to the study, so please be ready to answer all that you're comfortable with.

This will be a "semi-structured" interview. That means that we will ask you the questions below, but you can ask for clarification if you don't know what the questions mean or why we are asking them. We will make an audio recording of the interview. This is necessary because we will transcribe the interview and use this transcription to make sure we accurately record your responses. As noted in the consent form, we will not share your name or any personally identifiable information.

Before the interview begins, we will provide you with a $10 honorarium and answer any questions you have about the interview process. You may quit the interview before answering all of the questions. The following are the interview questions. You do not have to practice or think about the questions in advance. We simply provide them in advance for your information.

- *What is your name?*
- *What would you like me to use as your pretend name when I write about your answers?*
- *What do you consider to be your neighbourhood?*
- *What do you think it means to have a sense of community?*
- *How would you describe your sense of community in your neighbourhood?*
- *What do you like about your neighbourhood? Why?*
- *If you could change anything about your neighbourhood, what would it be? Why?*
- *Do you wish you spent more time or less time speaking with your neighbours? Why?*
- *What are the public/common spaces in your neighbourhood?*
  - *How do you use them?*
  - *Do you speak with your neighbours in these spaces? If so, when?*
    - *What types of things do to usually discuss?*
    - *Have you become more familiar with your neighbours this way? Why?*
  - *If you could change something about the public spaces in your neighbourhood, what would it be?*
  - *Think of a perfect public space for your neighbourhood—describe what it would be like.*
    - *How is the public space in your neighbourhood different from the one you just described?*
- *Do you consider your neighbourhood to be very dense?*
  - *Is it crowded?*
  - *Would you rather live in a less dense neighbourhood? Why?*
- *Tell me about how safe your neighbourhood is.*
  - *What would make it safer?*
- *With which culture do you most closely identify?*
  - *How do you think this culture tends to value sense of community?*
- *Which communities or groups do you feel connected to?*
  - *How would you rank the importance of your connection to these groups?*
- *What else can you think of that might increase your sense of community in your neighbourhood?*

Appendix G: Interview and survey summaries for interviewees

Name: Nick

Survey responses:

SOC Score:	2.31	**SOC Score**	0.04 standard deviations below survey average of 2.28

Postal code: V6T1N4 **Postal code density:** N/A **Postal code SOC** 2.43
Age: 28 **(average of** 4 **responses in postal code)**

Gender: M

Has kid 5-9: no

Rent or own: rent

Length at residence: Between 1 and 3 years

Type of residence: A high-rise apartment building

To improve neighborhood: more adult events monthly/bi-weekly

To improve SOC: more coffee shop

Interview responses:

Interview #: 1

Neighborhood: Nick thinks of his neighborhood as the people who live around him.

Likes about neighborhood: Nick likes the organized events and activities, like the community buy and sell.

To improve neighborhood: Nick would like a way to reduce bicycle theft in his neighborhood.

Public space use: Nick uses the reading room for several hours at a time for reading. He also uses the gym and walks through the park.

To improve public space: Renovate the gym.

Is neighborhood dense: no

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

Name: Dee

Survey responses:

SOC Score:	1.92	**SOC Score**	0.46 standard deviations above survey average of 2.28

Postal code: V6E1E4   **Postal code density:** 16,975   **Postal code SOC** 1.92

Age: 53   **(average of** 1 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: rent

Length at residence: Between 10 and 15 years

Type of residence: A high-rise apartment building

To improve neighborhood: My neighbourhood has everything I need and more

To improve SOC: If I had more time to actually interact with my neighbours socially

Interview responses:

Interview #: 2

Neighborhood: Dee considers the West End and Coal Harbor sections of Vancouver to be her immediate neighborhood, but also considers anywhere she can reach quickly by foot, bike, or bus to be within her neighborhood boundaries.

Likes about neighborhood: Dee likes the walkability and cultural diversity of her neighborhood.

To improve neighborhood: Dee would like to change the current city pet laws that resrict people from taking their dogs out in public to allow more opportunities for dogs to socialize and receive training, leading to a more integrated human/dog environment. She noted that in Germany, dogs were highly integrated into public spaces and were very well behaved.

Public space use: Dee likes to come to the local plaza to to read or to rest when she is dog walking.

To improve public space: Provide a public kiosk to advertise local events and services.

Is neighborhood dense: yes

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

Name: Seedsaver

Survey responses:

SOC Score:	2.04	**SOC Score**	0.31 standard deviations above survey average of 2.28

Postal code: V6E2E2   **Postal code density:** 26,099   **Postal code SOC** 2.04
Age: 57   **(average of** 1 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: rent

Length at residence: More than 15 years

Type of residence: A low-rise apartment building

To improve neighborhood: less traffic from garbage/recycling trucks in back lanes and main streets

To improve SOC: fewer vehicles on the road

Interview responses:
Interview #: 3

Neighborhood: Seedsaver considers her neighborhood to be Vancouver's West End, bounded by Robson, Thurlow, Stanley Park, and English Bay.

Likes about neighborhood: Seedsaver likes the diversity of culture and age in her neighborhood.

To improve neighborhood: Seedsaver would take out the high-rise buildings, reduce the automobile traffic, and provide housing configurations amenable to a diverse populations that is connected to the neighborhood.

Public space use: Seedsaver walks through her neighborhood and visits the seawall and the beach.

To improve public space: Provide more public spaces and provide shelter in the public spaces.

Is neighborhood dense: yes

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

232

Name: # Lyla

Survey responses:

SOC Score:	1.46	**SOC Score**	1.05 standard deviations above survey average of 2.28

Postal code: V6S0G8   **Postal code density:** N/A   **Postal code SOC**   1.58
Age: 35   **(average of** 2 **responses in postal code)**

Gender: F

Has kid 5-9:   no

Rent or own: own

Length at residence: Between 3 and 6 years

Type of residence: A low-rise apartment building

To improve neighborhood: Shared value for trash/waste disposal. The thing that irks me most often about my neighbourhood is

To improve SOC: My strongest sense of community comes from the daily "hello, how are you, how are the kids" chats that

Interview responses:

Interview #:   4

Neighborhood: Lyla considers her neighborhood to be Wesbrook Village on the University of British Columbia campus, with boundaries extending into the UBC campus, the UBC farm, and Pacific Spirit Park.

Likes about neighborhood: Lyla likes that she can walk to work, the grocery store, the coffee shop, playgrounds, and restaurants. She also likes that local proprietors recognize her.

To improve neighborhood: Lyla is frustrated by a lack of community responsibility as evidenced by people leaving behind garbage and dog poop in public areas and by people speeding through residential streets.

Public space use: Lyla uses the local roads and paths to commute by bicycle. She uses public spaces to access the local shops and restaurants. She uses the local playgrounds and community center for her children's

To improve public space: Provide an additional grocery store. Provide flat fields by playgrounds. Provide a dog park.

Is neighborhood dense: 'medium density'

Is neighborhood crowded: no

Is neighborhood safe: no

Prefer less density: no

Name: Kathy

Survey responses:

SOC Score:	3.15	**SOC Score**	1.12 standard deviations below survey average of 2.28

Postal code: V6S0H7   **Postal code density:** N/A   **Postal code SOC** 3.15
Age: 60   **(average of** 1 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: own

Length at residence: Between 1 and 3 years

Type of residence: A high-rise apartment building

To improve neighborhood: More security patrols, police presence, or stronger building security.

To improve SOC: More power to the residents-- this neighborhood is on UBC campus and UBC makes too many decisions.

Interview responses:

Interview #: 5

Neighborhood: Kathy's neighborhood is UBC Wesbrook Village, bounded by 16th Avenue, Southwest Marine Drive, and Pacific Spirit Park.

Likes about neighborhood: Kathy loves living next to Pacific Spirit Park because she likes the beautiful, natural environment. She also likes being able to live without a car because she feels she is saving money and hassle and acting sustainably.

To improve neighborhood: Kathy dislikes the density, lack of park space, lack of grocery shopping, and excessive auto traffic.

Public space use: Kathy uses the local coffee shop, water park, provincial park to associate with friends.

To improve public space: Provide more places to sit.

Is neighborhood dense: yes

Is neighborhood crowded: yes

Is neighborhood safe: yes

Prefer less density: yes

Name: Amelia

Survey responses:

SOC Score:	2.35	**SOC Score**	0.08 standard deviations below survey average of 2.28

Postal code: V6T2H1   **Postal code density:**   N/A   **Postal code SOC**   1.77
Age: 66   **(average of** 9   **responses in postal code)**

Gender:	F
Has kid 5-9:	no
Rent or own:	own
Length at residence:	Between 10 and 15 years
Type of residence:	A high-rise apartment building
To improve neighborhood:	GOVERNENCE ! ....and not the UNA !
To improve SOC:	GOVERNENCE !

Interview responses:
Interview #:   6

Neighborhood:	Amelia lives in Hampton Place on the UBC campus, but considers Wesbrook Village to be part of her extended neighborhood.
Likes about neighborhood:	Amelia loves living on the edge of Pacific Spirit Park and being connected to UBC.
To improve neighborhood:	Amelia would provide usable park space in place of the decorative traffic roundabouts, which she considers useless.
Public space use:	Amelia uses the 'greenway system' of parks in her neighborhood for recreation.
To improve public space:	Provide a place to talk about governance.
Is neighborhood dense:	yes
Is neighborhood crowded:	no
Is neighborhood safe:	no
Prefer less density:	no

Name: Claudia

Survey responses:

SOC Score:	1.31	**SOC Score**	1.25 standard deviations above survey average of 2.28

Postal code: V6T2C5   **Postal code density:** 30,800   **Postal code SOC** 1.56
Age: 34   **(average of** 2 **responses in postal code)**

Gender: F

Has kid 5-9: yes

Rent or own: rent

Length at residence: Between 1 and 3 years

Type of residence: A low-rise attached house

To improve neighborhood: I had to move due to a conflict with a neighbour, where we were harassed as a family. I would really

To improve SOC: More empathetic/respectful environment

Interview responses:

Interview #: 7

Neighborhood: Claudia considers her neighborhood to be Acadia Park on the UBC campus.

Likes about neighborhood: Claudia likes the park-like setting and cultural diversity of her neighborhood. She also likes the playgrounds and other places to run into neighbors.

To improve neighborhood: Claudia would like to have better engagement and communication from the property manager, UBC, especially in matters such as rent and changes to the parking availability . She would also like an arbitration mechanism to address conflicts between neighbors.

Public space use: "For entertaining, for connecting with my neighbors, for coming and going to my parking here but most of the times with my kids and the little one especially."

To improve public space: Provide bike racks. Provide more community garden space.

Is neighborhood dense: yes

Is neighborhood crowded: no

Is neighborhood safe: no

Prefer less density: no

Name: # Marie

Survey responses:

SOC Score: 1.42   **SOC Score**   1.10 standard deviations above survey average of 2.28

Postal code: V6T2J6   **Postal code density:** 28,136   **Postal code SOC** 1.42
Age: 55   **(average of** 1 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: own

Length at residence: Between 10 and 15 years

Type of residence: A low-rise attached house

To improve neighborhood: If it was less car oriented and easier to get around by walking and biking

To improve SOC: If more of my neighbours were out walking instead of driving.

Interview responses:

Interview #: 8

Neighborhood: Marie considers Hawthorn Place on the UBC campus to be her neighborhood, bounded by East Mall, Thunderbird Boulevard, West Mall, and Stadium Road.

Likes about neighborhood: Marie likes the local community center, coffee shop, playground, community garden, and dead-end street that children use to play hockey.

To improve neighborhood: Marie would like to have a car-free piazza with ground-level retail shops.

Public space use: Marie uses the local coffee shop, the community garden, and a local wooded area, but says, "mostly I'm walking through or biking through to get somewhere else."

To improve public space: Provide more retail space.

Is neighborhood dense: 'moderately dense'

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

237

Name: # Helen

Survey responses:

SOC Score:	1.42	**SOC Score**	1.10 standard deviations above survey average of 2.28

Postal code: V3N4K2   **Postal code density:** 7,322   **Postal code SOC** 1.78
Age: 64   **(average of** 3 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: own

Length at residence: Between 10 and 15 years

Type of residence: A low-rise apartment building

To improve neighborhood: More involvement from others in the building where I live.

To improve SOC:

Interview responses:
Interview #: 9

Neighborhood: Helen considers her neighborhood to be North Burnaby, bounded by the Trans-Canada Highway, North Road, Lougheed Town Centre, and Burnaby Lake.

Likes about neighborhood: Helen likes the green spaces, her ability to go to her neighbors when she needs something, and the lack of high-rises.

To improve neighborhood: Helen would like to have better communication among the stratas in the neighborhood.

Public space use: Helen uses the community pool and hot tub for relaxing, the library in the lounge, the lounge for council
meetings, and the building's woodworking shop for household projects.

To improve public space: Make public spaces more accessible for people with mobility constraints.

Is neighborhood dense: no

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

Name: Olivia

Survey responses:

SOC Score:	2.04	**SOC Score**	0.31 standard deviations above survey average of 2.28

Postal code: V6T1R9
Age: 27

Postal code density: N/A

Postal code SOC 2.54
(average of 6 **responses in postal code)**

Gender:	F
Has kid 5-9:	no
Rent or own:	rent
Length at residence:	Between 1 and 3 years
Type of residence:	A low-rise apartment building
To improve neighborhood:	more community activities designed for families without any children
To improve SOC:	More casual gatherings to meet

Interview responses:

Interview #: 10

Neighborhood:	Olivia considers her neighborhood to be Acadia Park on the UBC Campus, bounded by University Village, Pacific Spirit Park, Wesbrook Mall, and Wesbrook Village.
Likes about neighborhood:	Olivia likes the proximity to a forest and hearing kids playing.
To improve neighborhood:	Olivia would like more social spaces, like coffee shops.
Public space use:	Olivia uses the gym and the community room in her community center.
To improve public space:	Provide more coffee places. Provide a community tea bar.
Is neighborhood dense:	no
Is neighborhood crowded:	no
Is neighborhood safe:	yes
Prefer less density:	no

239

Name: Liz

Survey responses:

SOC Score: 1.38   **SOC Score**   1.14 standard deviations above survey average of 2.28

Postal code: V3H3Z6   **Postal code density:** 1,981   **Postal code SOC** 1.38
Age: 39   **(average of** 1 **responses in postal code)**

Gender: F

Has kid 5-9: yes

Rent or own: own

Length at residence: Between 3 and 6 years

Type of residence: A low-rise attached house

To improve neighborhood:

To improve SOC:

Interview responses:

Interview #: 11

Neighborhood: Liz considers her neighborhood to be her (Port Moody) townhouse complex and the area within walking distance, with boundaries including Ioco Road, Newport Village, and Suter Brook Village.

Likes about neighborhood: "I like that kids can just run outside and find someone to play with.... They're comfortable here. They have a bit of independence, where I don't always have to be with them. They can create their own adventures without me or my husband, which is important, I think, for them. And it's also nice for us, too, because we can just sit at home and we know they're safe. They'll be okay. We don't have to constantly

To improve neighborhood: Liz would like to keep cars out of the neighborhood.

Public space use: Liz uses the playgrounds for her children, and she uses the local community room, sauna, and pool.

To improve public space: Liz likes the public space in her neighborhood the way it is. It has a pool and a park and a lot of green space.

Is neighborhood dense: yes

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: yes

Name: Grace

Survey responses:

SOC Score:	1.50	**SOC Score**	1.00 standard deviation above survey average of 2.28

Postal code: V3H5K9   **Postal code density:** 9,615   **Postal code SOC** 1.54
Age: 64   **(average of** 6 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: own

Length at residence: Between 10 and 15 years

Type of residence: A low-rise apartment building

To improve neighborhood: More shared spaces such as a garage, workshop, parks

To improve SOC: Cafe with karaoke night, trivia night

Interview responses:

Interview #: 12

Neighborhood: Grace considers her neighborhood to be the Klahanie area in Port Moody, bounded by Murray and the railroad tracks and extending to the high rises to the East.

Likes about neighborhood: "I like that it's quiet...kind of peaceful....I like that all the people here are interesting. They're from a variety of age groups....They haven't all grown up in Port Moody or Coquitlam for their entire lives. They're from everywhere. I find that interesting. I like that. I like the green. I love the amount of green

To improve neighborhood: Grace would like to calm the traffic and provide more recreational spaces for adults.

Public space use: Grace has used the community room in her building for family gatherings and the coffee shop for business meetings. She hasn't used the neighborhood community space because she doesn't have large parties and she doesn't use the local playground because it is a tot lot and her children are too

To improve public space: Make the public space more welcoming to children of various ages.

Is neighborhood dense: no

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

Name: Lou

Survey responses:

SOC Score:	1.54	**SOC Score**	0.95 standard deviations above survey average of 2.28

Postal code: V3H5L2 **Postal code density:** 9,615 **Postal code SOC** 1.88
Age: 61 **(average of** 4 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: own

Length at residence: Between 6 and 10 years

Type of residence: A low-rise apartment building

To improve neighborhood: More responsible pet owners, less poop, less barking.

To improve SOC: More others who are interested in making a strong community.

Interview responses:
Interview #: 13

Neighborhood: Lou lives in the Klahanie neighborhood, but considers her neighborhood to include all of Central Port Moody.

Likes about neighborhood: "I like the physical aspects of it. I like the way it looks. I like the way it is livable. It's not too many high rises. Different sizes of units. So, it kind of encompasses a whole lot of different people. I love the fact that it's right across the street from Rocky Point Park and I like that everything we really need is within walking distance. And also Skytrain now, that's a huge advantage to us."

To improve neighborhood: Lou would like to have fewer dogs in the neighborhood. It bothers her that people don't clean up after their dogs and let them bark at night.

Public space use: Lou uses the local community center for recreation and group activities. She doesn't use the green space, which she thinks is used by dogs and kids. She uses the sidewalks and city park for walking, exercise, and meeting people.

To improve public space: Provide a green space with comfortable seating, such as picnic tables.

Is neighborhood dense: yes

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

242

Name: Ineth

Survey responses:

SOC Score:	1.31	**SOC Score**	1.25 standard deviations above survey average of 2.28

Postal code: V3H5K4
Age: 69

Postal code density: 9,498

Postal code SOC 1.77
(average of 4 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: own

Length at residence: Between 6 and 10 years

Type of residence: A low-rise apartment building

To improve neighborhood: Less reliance on cars, more park space, less noise from landscapers (especially leaf blowers), less

To improve SOC: More community get-to-gethers

Interview responses:

Interview #: 14

Neighborhood: Ineth lives in the Klahanie neighborhood, but considers her neighborhood to be confined to her four-story building and the neighbors who live on either side of her.

Likes about neighborhood: "We can walk everywhere....This is what was so appealing when we moved here.... I can walk to my dentist, my eye doctor, my...GP,...the bank,...the grocery store,...the library. I can walk to ... I have a choice between two gyms. And I can walk out my door, and I can go across the street, and I'm at the ocean. I could never live anywhere I didn't have immediate access into a park or some kind of nature....I can walk or ride my bike, and in half an hour I'm in the middle of the woods and there's nobody around. And I don't think I could ... I would never want to move away from here."

To improve neighborhood: Ineth would prefer to remove the two high rise buildings from the area.

Public space use: When Ineth had a dog, she would use the public spaces in her neighborhood (except the playground) to walk the dog and speak with people along the way.

To improve public space: Ineth would not change the public space in her neighborhood.

Is neighborhood dense: no

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

243

Name: Whohan

Survey responses:

SOC Score: 1.77   **SOC Score**   0.65 standard deviations above survey average of 2.28

Postal code: V3H5C8   **Postal code density:** 9,718   **Postal code SOC** 1.77
Age: 62   **(average of** 1 **responses in postal code)**

Gender: F

Has kid 5-9: no

Rent or own: rent

Length at residence: Between 6 and 10 years

Type of residence: A low-rise apartment building

To improve neighborhood: More people which would equal more shops and services

To improve SOC: A more community active community association

Interview responses:

Interview #: 15

Neighborhood: Whohan considers Moody Centre in Port Moody to be her neighborhood.

Likes about neighborhood: "What I really, really like about Moody Center is the potential of Moody Center. I really, really like that that there is so much potential for real positive change in Moody Center through the range--social, economic, development--the full range. Like it's really just sitting there...ready for changes to happen that can have positive impact."

To improve neighborhood: Whohan would like to see the main thoroughfare through town better integrated into the local neighborhood, rather than merely moving traffic through it. She would also like the local neighborhood association to better represent a diversity of views.

Public space use: Whohan uses the coffee shops and the city park. She likes Brewer's Row and serves on the board of the local museum. She was recently involved in a volunteer effort to enliven her local main street with donated street furniture.

To improve public space: Provide sheltered outdoor space and improve the local community center.

Is neighborhood dense: no

Is neighborhood crowded: no

Is neighborhood safe: yes

Prefer less density: no

Appendix H: Interview response summaries by question

Responses summary 01: Area interviewee considers to be his/her neighborhood

Name	Response summaries
Nick	Nick thinks of his neighborhood as the people who live around him.
Dee	Dee considers the West End and Coal Harbor sections of Vancouver to be her immediate neighborhood, but also considers anywhere she can reach quickly by foot, bike, or bus to be within her neighborhood boundaries.
Seedsaver	Seedsaver considers her neighborhood to be Vancouver's West End, bounded by Robson, Thurlow, Stanley Park, and English Bay.
Lyla	Lyla considers her neighborhood to be Wesbrook Village on the University of British Columbia campus, with boundaries extending into the UBC campus, the UBC farm, and Pacific Spirit Park.
Kathy	Kathy's neighborhood is UBC Wesbrook Village, bounded by 16th Avenue, Southwest Marine Drive, and Pacific Spirit Park.
Amelia	Amelia lives in Hampton Place on the UBC campus, but considers Wesbrook Village to be part of her extended neighborhood.
Claudia	Claudia considers her neighborhood to be Acadia Park on the UBC campus.
Marie	Marie considers Hawthorn Place on the UBC campus to be her neighborhood, bounded by East Mall, Thunderbird Boulevard, West M all, and Stadium Road.
Helen	Helen considers her neighborhood to be North Burnaby, bounded by the Trans-Canada Highway, North Road, Lougheed Town Centre, and Burnaby Lake.
Olivia	Olivia considers her neighborhood to be Acadia Park on the UBC Campus, bounded by University Village, Pacific Spirit Park, Wesbrook Mall, and Wesbrook Village.
Liz	Liz considers her neighborhood to be her (Port Moody) townhouse complex and the area within walking distance, with boundaries including Ioco Road, Newport Village, and Suter Brook Village.
Grace	Grace considers her neighborhood to be the Klahanie area in Port Moody, bounded by Murray and the railroad tracks and extending to the high rises to the East.
Lou	Lou lives in the Klahanie neighborhood, but considers her neighborhood to include all of Central Port Moody.
Ineth	Ineth lives in the Klahanie neighborhood, but considers her neighborhood to be confined to her four-story building and the neighbors who live on either side of her.
Whohan	Whohan considers Moody Centre in Port Moody to be her neighborhood.

Responses summary 02: Interviewee's understanding of the phrase "sense of community"

Name	Response summaries
Nick	A group of people residing together like a team.
Dee	"You have a sense of belonging. You know the people around you.... You feel safe and you also have a sense of responsibility to it, and not quite a sense of ownership but you don't like to see it vandalized, you like to see stuff taken care of. It's your home."
Seedsaver	"You feel a sense of place in your neighborhood. It's diverse--a safe location... Familiarity with people that you might see in the neighborhood, buildings, public spaces. Just basically a sense of belonging."
Lyla	"A big part of having a sense of community is a sense of security in the neighborhood." It means you feel safe letting your children play outside because if they needed help another adult in the neighborhood would help them.
Kathy	"A sense of community means that you are some place where you feel like other people feel like you belong.... Where you feel comfortable, where you feel like it's familiar, where you have something in common to talk with people about."
Amelia	A willingness to speak up, join, and be a part of a community.
Claudia	A sense of belonging and feeling connected.
Marie	"I think it means to feel connected with the people that you're living near, people in your community, and feeling a sense of belonging and a sense of ownership, as well. (It means) feeling strongly enough about what's happening in your neighborhood that you want to make things good."
Helen	"I think it means knowing the people that live around you and being involved."
Olivia	"I think it means to be happy going back home, being able to confidently smile and say hello to people in my building or around the area I live in, and feeling safe."
Liz	"To be able to stop and have conversations with people is pretty important. And the walking is also super important because I find in a place where you can walk, you bump into people again. It's other opportunities for conversation and getting to know your neighbors."
Grace	Feelings of belonging and inclusion.
Lou	"I think the feeling that you're safe where you are, that there are other people here that care whether you exist in this area, that you can stop with a neighbor on the street and have a chat."
Ineth	"people who share my values"
Whohan	"To be engaged and feel like I'm contributing to the community's spirit and growth and that the community is contributing to my growth."

Responses summary 03: Interviewee's description of their own sense of community

Name	Response summaries
Nick	Nick expresses his sense of community by volunteering and being helpful and active in his neighborhood.
Dee	Dee's sense of community in her neighborhood is colored by her role as a property manager, which leaves her "engaged with a certain amount of reservation."
Seedsaver	"I feel a sense of belonging--a familiarity with my neighborhood, where places are like public buildings, schools, churches, community garden, public spaces. I don't feel so much of a sense of community with the new buildings that have replaced the former old buildings that were three or four story walk up buildings. Now we have these new very large condo towers, and I feel we no longer has eyes on this street. It's more alienated because you don't know the people that live in those buildings."
Lyla	"I have a strong sense of community. I love where I live. I love my home. I love the amenities near my home..the shops, the community center, the forest."
Kathy	Kathy feels isolated in her high-rise but has found an online queer woman Facebook group in which to find company.
Amelia	Amelia loves her neighborhood and knows many of her neighbors, but doesn't like living in a strata arrangement.
Claudia	"I do feel truly connected and I do feel part of the community. I do think that we are building this community and this neighborhood with the people that are here. It it's a dynamic community and sometimes I miss people that leave but then I'm always happy to connect with new neighbors and welcome them to the neighborhood."
Marie	"I feel very connected to my community, and I think one of the big factors in that for myself is that I actually was one of the first people to move into this neighborhood when it first started, the very first building that went in for staff and faculty. We were one of the first families to move in, so we saw the whole neighborhood grow up around us. I do feel a deep ownership to what's going on in the neighborhood, and I know a lot of the people who have lived here for a while."
Helen	"I can remember growing up, when my parents would have two or three tables set up in the living room and have other couples come over and play cards for an evening. That doesn't happen anymore. So I think that the sense of mmunity is declining as people go their own way and there's so many things out there happening that everybody's got other things to do."
Olivia	"Trying to interact and meeting as many people as possible in the neighborhood, that's kind of our sense of community. Relative to the earlier neighborhoods, I would say it's very strong here."
Liz	"One of the reasons...we chose our complex was because...there were kids playing outside, or there were obvious signs that kids were just playing outside. So, helmets and bikes all over the place....There was enough room for cars to drive by, but also sort of a space in front of each of the units. So, there

	would be... it seemed every third or fourth house had a hockey net, and garages were open, and bikes were just thrown on the ground. It seemed like a 'lived in' place. It seemed like a place where kids could run out the door and find a bunch of friends and play in the neighborhood."
Grace	"My sense of community here is that people help each other. Like on Saturday, we had a Klahanie garage sale, and although I wasn't volunteering at it, I went down there. I must have seen five, six people that I knew. You just leave feeling really good, because you had a cup of coffee with them, and you see everything from pregnant moms all the way up to elderly seniors that are there, all sort of knowing each other."
Lou	"I feel at home here for sure and it's a comfortable environment. It's a safe environment. There's lots of people that I've met who have similar sort of outtakes on life."
Ineth	"That we respect each other's privacy, that we aren't noisy."
Whohan	Whohan likes her neighborhood and feels engaged in her neighborhood, but feels that her sense of community "struggles" for lack of a strong community association and lack of a good meeting venue.

Responses summary 04: What interviewee likes about neighborhood

Name	Response summaries
Nick	Nick likes the organized events and activities, like the community buy and sell.
Dee	Dee likes the walkability and cultural diversity of her neighborhood.
Seedsaver	Seedsaver likes the diversity of culture and age in her neighborhood.
Lyla	Lyla likes that she can walk to work, the grocery store, the coffee shop, playgrounds, and restaurants. She also likes that local proprietors recognize her.
Kathy	Kathy loves living next to Pacific Spirit Park because she likes the beautiful, natural environment. She also likes being able to live without a car because she feels she is saving money and hassle and acting sustainably.
Amelia	Amelia loves living on the edge of Pacific Spirit Park and being connected to UBC.
Claudia	Claudia likes the park-like setting and cultural diversity of her neighborhood. She also likes the playgrounds and other places to run into neighbors.
Marie	Marie likes the local community center, coffee shop, playground, community garden, and dead-end street that children use to play hockey.
Helen	Helen likes the green spaces, her ability to go to her neighbors when she needs something, and the lack of high-rises.
Olivia	Olivia likes the proximity to a forest and hearing kids playing
Liz	"I like that kids can just run outside and find someone to play with.... They're comfortable here. They have a bit of independence, where I don't always have to be with them. They can create their own adventures without me or my husband, which is important, I think, for them. And it's also nice for us, too,

	because we can just sit at home and we know they're safe. They'll be okay. We don't have to constantly be with them."
Grace	"I like that it's quiet...kind of peaceful....I like that all the people here are interesting. They're from a variety of age groups....They haven't all grown up in Port Moody or Coquitlam for their entire lives. They're from everywhere. I find that interesting. I like that. I like the green. I love the amount of green here."
Lou	"I like the physical aspects of it. I like the way it looks. I like the way it is livable. It's not too many high rises. Different sizes of units. So, it kind of encompasses a whole lot of different people. I love the fact that it's right across the street from Rocky Point Park and I like that everything we really need is within walking distance. And also Skytrain now, that's a huge advantage to us."
Ineth	"We can walk everywhere....This is what was so appealing when we moved here.... I can walk to my dentist, my eye doctor, my...GP,...the bank,...the grocery store,...the library. I can walk to ... I have a choice between two gyms. And I can walk out my door, and I can go across the street, and I'm at the ocean. I could never live anywhere I didn't have immediate access into a park or some kind of nature....I can walk or ride my bike, and in half an hour I'm in the middle of the woods and there's nobody around. And I don't think I could ... I would never want to move away from here."
Whohan	"What I really, really like about Moody Center is the potential of Moody Center. I really, really like that that there is so much potential for real positive change in Moody Center through the range--social, economic, development-- the full range. Like it's really just sitting there...ready for changes to happen that can have positive impact."

Responses summary 05: What interviewee would change about neighborhood

Name	Response summaries
Nick	Nick would like a way to reduce bicycle theft in his neighborhood.
Dee	Dee would like to change the current city pet laws that resrict people from taking their dogs out in public to allow more opportunities for dogs to socialize and receive training, leading to a more integrated human/dog environment. She noted that in Germany, dogs were highly integrated into public spaces and were very well behaved.
Seedsaver	Seedsaver would take out the high-rise buildings, reduce the automobile traffic, and provide housing configurations amenable to a diverse populations that is connected to the neighborhood.
Lyla	Lyla is frustrated by a lack of community responsibility as evidenced by people leaving behind garbage and dog poop in public areas and by people speeding through residential streets.
Kathy	Kathy dislikes the density, lack of park space, lack of grocery shopping, and excessive auto traffic.
Amelia	Amelia would provide usable park space in place of the decorative traffic

	roundabouts, which she considers useless.
Claudia	Claudia would like to have better engagement and communication from the property manager, UBC, especially in matters such as rent and changes to the parking availability . She would also like an arbitration mechanism to address conflicts between neighbors.
Marie	Marie would like to have a car-free piazza with ground-level retail shops.
Helen	Helen would like to have better communication among the stratas in the neighborhood.
Olivia	Olivia would like more social spaces, like coffee shops.
Liz	Liz would like to keep cars out of the neighborhood.
Grace	Grace would like to calm the traffic and provide more recreational spaces for adults.
Lou	Lou would like to have fewer dogs in the neighborhood. It bothers her that people don't clean up after their dogs and let them bark at night.
Ineth	Ineth would prefer to remove the two high rise buildings from the area.
Whohan	Whohan would like to see the main thoroughfare through town better integrated into the local neighborhood, rather than merely moving traffic through it. She would also like the local neighborhood association to better represent a diversity of views.

Responses summary 06: Whether interviewee would prefer to spend more time speaking with neighbors

Name	Response summaries
Nick	Nick speaks with his neighbors about as much as he would like to.
Dee	Dee wishes she spent more time, but feels that she and her neighbors lack time for socializing due to rigorous work schedules.
Seedsaver	"Maybe sometimges more" but "the way it is is fine."
Lyla	'Neither more nor less.'
Kathy	Yes.
Amelia	"Well, on strata issues I wish I spent less time talking to my neighbors, on strata issues. So there's strata community and the broader community. I love talking to my neighbors."
Claudia	Yes.
Marie	Yes.
Helen	Helen: (Laughs) With my outside neighbors, outside of the condo, I wish I could spend more time talking to them. But the ones inside my condo? Sometimes I wish I could spend less. Eric: Is that because of your role as president? Helen: Yeah, pretty much. Eric: Were you not in an official capacity- Helen: Were I not president- Eric: ...would you wish to spend more or less time speaking with the people in

	your building than you do right now, or would it be about right? Helen: Probably more. Probably more, because most of them contact me when they have problems.
Olivia	Olivia: More time because I don't think I speak that much. Eric: Why would you want to, though? Olivia: In general, when I talk to people, I realize that I start feeling better. If I'm having a bad day, and then I come home walking with a friend and we chat, it makes me feel better all of a sudden. So that would happen, maybe. As I mentioned, we have made friends sometimes by randomly talking in events, so that can happen. We kind of continued seeing these friends, so maybe these talks would lead to good friendships. Eric: Is that valuable to you? Olivia: Yeah, of course. I mean, it really helps in hard days. Eric: How? Olivia: As I said, like if I'm having a bad day, after talking to a friend or ... not strangers, but after talking to friends, the things that make me feel bad seem smaller all of a sudden. They seem less important, and I don't know how that happens. Maybe I just stop thinking about them.
Liz	Liz has as many opportunities to socialize in her neighborhood as she would like.
Grace	Grace: Oh gosh, I would say more.Eric: Why do you wish you spent more time talking with your neighbors? Grace: Right back full circle to some of your first questions, because it gives me a sense of community, makes me feel at home, makes me feel safe, entertains me.
Lou	Yes.
Ineth	Ineth speaks with her neighbors daily and is satisfied with her level of interaction.
Whohan	Yes.

Responses summary 07: What interviewee considers to be neighborhood public spaces

Name	Response summaries
Nick	a small park, a reading room, a social room, and a gym
Dee	two local streets that are closed to auto traffic
Seedsaver	im Davis Square Mall, a community garden, Nelson Park, the English Bay and Cole Harbor sea walls, Stanley Park, the mini park on Butte, and the mini park on Cardero.
Lyla	The sidewalks, the shops, the community center, the forest, the farm, the hallways and the building lobby.
Kathy	Strip parks, Wesbrook Community Centre
Amelia	Roundabouts, sidewalks
Claudia	"Everything but the houses"

Marie	Old Barn Community Centre
Helen	Park with playground; 'Doggie Lane;' field with BBQ area and horseshoe pit area; indoor recreation area with spa, pool, lounge, library, ping-pong table, gym, and woodworking shop.
Olivia	Community center with community room and gym, coffee shop.
Liz	Several parks, including a childrens park with a swing and a sandbox; pool
Grace	Coffee shop, children's playground, condominium amenity rooms, community center, city park
Lou	Green space; community center with gym, movie room, dance room, lounge, pool, hot tub; city park; coffee shop
Ineth	Community center, building courtyard, green space (used by people with dogs), playground, creekside walkway with benches
Whohan	Coffee shops, street plaza, city park, 'Brewers' Row'

Responses summary 08: How interviewee uses neighborhood public spaces

Name	Response summaries
Nick	Nick uses the reading room for several hours at a time for reading. He also uses the gym and walks through the park.
Dee	Dee likes to come to the local plaza to to read or to rest when she is dog walking.
Seedsaver	Seedsaver walks through her neighborhood and visits the seawall and the beach.
Lyla	Lyla uses the local roads and paths to commute by bicycle. She uses public spaces to access the local shops and restaurants. She uses the local playgrounds and community center for her children's activities.
Kathy	Kathy uses the local coffee shop, water park, provincial park to associate with friends.
Amelia	Amelia uses the 'greenway system' of parks in her neighborhood for recreation.
Claudia	"For entertaining, for connecting with my neighbors, for coming and going to my parking here but most of the times with my kids and the little one especially."
Marie	Marie uses the local coffee shop, the community garden, and a local wooded area, but says, "mostly I'm walking through or biking through to get somewhere else."
Helen	Helen uses the community pool and hot tub for relaxing, the library in the lounge, the lounge for council meetings, and the building's woodworking shop for household projects.
Olivia	Olivia uses the gym and the community room in her community center.
Liz	Liz uses the playgrounds for her children, and she uses the local community room, sauna, and pool.
Grace	Grace has used the community room in her building for family gatherings and

	the coffee shop for business meetings. She hasn't used the neighborhood community space because she doesn't have large parties and she doesn't use the local playground because it is a tot lot and her children are too old for it.
Lou	Lou uses the local community center for recreation and group activities. She doesn't use the green space, which she thinks is used by dogs and kids. She uses the sidewalks and city park for walking, exercise, and meeting people.
Ineth	When Ineth had a dog, she would use the public spaces in her neighborhood (except the playground) to walk the dog and speak with people along the way.
Whohan	Whohan uses the coffee shops and the city park. She likes Brewer's Row and serves on the board of the local museum. She was recently involved in a volunteer effort to enliven her local main street with donated street furniture.

Responses summary 09: When interviewee speaks with neighbors in neighborhood public spaces

Name	Response summaries
Nick	Nick speaks with his neighbors in the park and in the gym.
Dee	Dee is more likely to speak with her neighbors if they have kids or dogs. Often, however, she prefers to use the public realm as a respite and doesn't engage with others.
Seedsaver	Seedsaver speaks with her neighbors when she sees them at the local beach.
Lyla	Lyla will say hello to neighbors waiting for the elevator, but will have longer conversations with people she meets and knows at the playgrounds.
Kathy	Kathy speaks with her neighbor when they meet at the water park (for kids' play date) and sometimes meets neighbors at the coffee shop.
Amelia	Amelia speaks with her neighbors when she sees them on the sidewalk.
Claudia	Claudia speaks with her neighbors when she sees them.
Marie	Marie speaks with her neighbors when walking to the grocery store and when traveling through the common covered garage area, which is often used by children.
Helen	Helen speaks with her neighbors when visiting the common pool and lounge areas.
Olivia	Olivia speaks with her neighbors in the gym and at community events.
Liz	Liz speaks with her neighbors when she uses the pool.
Grace	Grace speaks with neighbors at the farmers market and at the coffee shop.
Lou	Lou speaks with her neighbors when she sees someone she knows.
Ineth	Ineth likes to strike up conversations with strangers and looks for opportunities to do so.
Whohan	"When I walk down the street, I say, 'Hello.' I used to always do it, but the Port Moody Foundation started a say hello program couple of years ago, which is fantastic...a little campaign called 'Say "Hello" PoMo'.... And they really wanted to encourage people to literally say hello to people as they're walking

	past them on the trails or on the streets and stuff. And then they also built neighborhood Facebook community pages. So each neighborhood they built and they got people within the community engaged to...help the administration of the pages."

Responses summary 10: What interviewee discusses with neighbors in neighborhood public spaces

Name	Response summaries
Nick	"Family, vacation and grocery shopping, because sometimes I've found that they got something that I don't know where they can get, so I ask them."
Dee	"Well there's a lady that lives next door to me, and we talk about her dogs, we talk about her life. She is so crushingly lonely, that I almost want to cry every time I see her because I can just see she is bottled up alone. I haven't seen her for three weeks because I literally get three weeks of news. So I don't know how many other people she speaks to.'
Seedsaver	"It could be just about the weather, or how they're doing or how I'm doing."
Lyla	"We have the one neighbor who she's quite friendly. She has a small dog that is calm and fluffy and so is beloved by toddlers. And so she'll stop and have a... like if you run into her she might be walking past the playground. So she might stop and have a chat or we might be in the lobby of the building and we'll stop and have a longer chat with her. But she's really the exception to everything."
Kathy	"Usually neighborhood related things, but except for if it's a colleague from UBC, then we might talk about term or UBC related things."
Amelia	"We talk about everything, we talk about the weather...that's sort of the least troublesome topic. And we talk a lot about the fact that there's no governance at UBC."
Claudia	"We tend to talk a lot about work and family balance. We also talk about events. With my husband, we used to organize a lot of things but now we attend too many events outside UBC and well also within UBC but especially with the Latin American community. And, we also talk about financial help, like sometimes we tell them about scholarships. Since we fit in the same profile as our neighbors some of the scholarships kind of, can be interesting for them if we know. And even like domestic stuff like 'Where do you buy your groceries?' 'Do you use car share?'"
Marie	"It's a variety of things. With our immediate neighbors in our building, it might be issues related to Strata, to the building itself, or things that are going on. It might be the weather. If we're barbecuing, it might be something about cooking. It might be sports related, it might be kid related. Just a variety of things."
Helen	"With the kids... I just ask them what they learned in school in the last week....that'll start a conversation. If I can pull one direct answer out of them, I can build on it."

Olivia	"When I talk to people, we become friends (or we were already friends) so we talk about anything related to life....It can be anything."
Liz	"It depends on how well you know them, right? So if it's people you've met before, its talk about life or their kids. Or if it's people you don't know, it's 'What do you do? Where do you live? How long have you been here?' That kind of 'getting-to-know-you' kind of stuff. I was at the pool yesterday with the kids (because it just opened up this weekend) and I met a guy who is opening up a new micro brewery, so it was kind of cool to hear all about that, what that's like and how that's going."
Grace	"Oh, well strata politics.... The more you're involved in the community--with improving it or dealing with issues--the deeper your relationship is with the person. So it's worth it to go through that stress to solve a community problem, because then all of a sudden you're not just talking about the weather. You're talking about the good of your neighbors or, 'Isn't that great that that got improved?' Or, 'What a mess that is. How are we going to... Are we going to call the police about that?' So, it's much more than gossip. It's more about solving community problems. So, sometimes it's that heavy stuff, and sometimes it's just like, 'How's your kid? Did he get over his cold?' Sometimes it's superficial like, 'Isn't this a beautiful day?' But it still can make you feel like you belong."
Lou	"Could be activities that are coming up. It could be how their kids are doing, it could be just visiting with them or their dogs over just general conversation. Sometimes a little bit more in depth, if there are people we know well, like there's a great photographer here and I'll ask him what he's been photographing recently or a lot of the music types that we interact at a little deeper level, kind of know more a bit more about their lives. So we'll have conversations about whatever's going on with them."
Ineth	"Well, the majority of them are the people who have dogs that we already know....That becomes...the icebreaker. And then we talk ... We ... Then it drifts into weather, and what you're going to do today, and how your garden is ... The older people I find as now in our age group, we'll talk about health. We kind of have little ... We all seem to know what our respective health conditions are when you get past 60....And then the other things that seem to come up are complaints....What somebody did in somebody's building, or how fast people are driving here,... Why isn't the city taking care of the trees? And just general kind of ... Yeah, complaints seem to be a thing that you can kind of get into. And then I know a lot of people know that we're kind of their...environmental connection. And a lot of people know that, because I'm on the environmental protection committee with the city, and a lot of people know from my posts on the page. Because I know a lot about wildlife and the heron colony, and things like that. People will ask me things about, well did you know that there was a bear coming through the neighborhood or something like that. That kind of thing."
Whohan	"So if its neighbors whom I don't know, who literally I've just said hello and we've actually stopped for some unknown reason why they looked interesting or I looked interesting or whatever it was, probably fairly innocuous

| | conversations. 'Hi, how are you? Have you lived in Port Moody long?'...I often ask 'Do you live here?', especially if I'm in Rocky Point or on the trail or something....Conversations tend to be fairly general and happy and 'isn't it beautiful weather' kind of stuff. If I run into people I know in a any of those spots, probably the conversation is going to be fairly topical to something that may or may not be happening in Port Moody at the time. Like the mayor right now. That'll be the topic of conversation." |

Responses summary 11: Why interviewee has gotten to know neighbors better by speaking with them in neighborhood public spaces

Name	Response summaries
Nick	"Because I know their background right now. Like I know where they got their education from, what do they do right now. Maybe I know that they have three kids. I know those kinds of things, it's better for me to understand more when I try to talk with them. "
Dee	"Because you've taken the time to talk to them. "
Seedsaver	"Because you engage in conversation with them. There's a familiarity from seeing them and then from talking to them in different places."
Lyla	"There's the lady with the fluffy dog and then there's the lady who's just very open and so we develop longer conversations because she is just a chatty person. The other people who I know in the neighborhood who I have longer conversations with, those relationships are not a result of just like the transit or necessarily hanging out at the playground. So some of them are a result of stroller fit at the community center. (A stroller fit-- the baby is in the stroller while you exercise next to the stroller.) So a number of good friends are a result of that."
Kathy	"No, you know, the only new friends I've made in Vancouver have been from work or friends of colleagues....And then this queer women's group. You know, I've started doing stuff with them. They mostly all live over by...Commercial Drive. It's kind of the gay-borhood for women."
Amelia	"I just assume that if people are upset that they will speak up, (but) 99% of people will not say a word."
Claudia	"Yeah, I mean that's the first approach that anyone can have with another person, just go and talk. And I'm very lucky to be... my backyard leads to the newest playground so I get a lot of people."
Marie	"Definitely, yeah. Especially when it's a spontaneous interaction, or somebody's just walking past and you might comment on something. I think even very small events like that can help you to get to know someone a little better. We had new neighbors move in next door to us just last year, and I remember one of my first interactions after meeting them was they noticed that we had put blueberry bushes in at the end of our patio, and they immediately commented on that and said, 'Oh, that's a great idea. We're going to do the same thing.' So, that very short interaction gave me a strong sense of one thing that they valued in terms of having something that they could eat on their patio, which...was something in common....So, even the very small

	interactions, I think, can help you to get to know what people are like and finding common ground."
Helen	"Oh absolutely....I never would have known that this particular woman was involved in community theater if I hadn't sat down and chatted with her and asked her, 'What have you been up to?'"
Olivia	"Because...these events...there's food... people are ready to talk, so we just meet, and we start talking....In the beginning, it's a bit surface. But then if you realize, this person is really fun to talk to, or if you realize there's some connection, you have some common things to talk about, then you start talking more. Then you exchange contacts, and then the friendship kind of starts to carry on apart from the event."
Liz	"Yeah, absolutely....I think it's because it's sort of neutral territory that you can get to know somebody. It can be sometimes difficult to invite somebody into your home right away. Or to expect an invitation to somebody else's home. So these sort of neutral, but common spaces - I think common is a better word - it's easier to have conversation."
Grace	"Oh, for sure, because they're sharing their problems with you, and you're helping them, or they're helping you with theirs. So that's human interaction....You might see someone on the Klahanie Facebook page who has some strong opinion about some goofy thing. Then I immediately think, 'Oh, I'm not going to like that person. I think she's pro this or anti that.' Then if you meet them here and you see them face-to-face and you have a conversation about something else, there's more depth to it."
Lou	"Well, my husband's a musician, so he plays in farmer's markets and things like that. So you interact in other spaces and you get to know the people through other spaces and then they come to our house. So then it's within our home, but then you've already had that introduction. The public spaces here make that an easier transition, right? I don't invite strangers into my house. Not Too often anyway."
Ineth	"Yeah....If I'm talking to somebody and I started talking about the herons, somebody will say, "Oh, you're the lady?" Or, "Are you {redacted} on the Facebook page?" And I'll say, "Yeah." There's kind of those kind of connections that happen."
Whohan	"Because I think that, maybe because people tend to walk the same places all the time. And so there are people who I have run into more than once now. So, it's not just a hello, it's, 'I remember, I talked to this person.' Or they go, 'I saw that person.' Like it becomes more of a bit of a connection every time you run into somebody that you've seen someplace before.... J is a perfect example of this. She's really good. We are diametrically opposed on many, many, many, many things--many things, but we also connect on some certain things. So we'd never met, outside of some conversations on Facebook. Crossed her on a trail, said hello because we sort of knew each other but we'd never met, but our faces were familiar....We're both very, very active in the community. And so that hello built to more of a conversation and then the next time it strengthened the conversation and the next time we managed to have a private conversation

	that really shifted the foundation of a fairly antagonistic relationship to something that's not at all antagonistic. So it really did start, though, from a recognition of who that person was and just a simple hello."

Responses summary 12: What interviewee would change about neighborhood public spaces

Name	Response summaries
Nick	Renovate the gym.
Dee	Provide a public kiosk to advertise local events and services.
Seedsaver	Provide more public spaces and provide shelter in the public spaces.
Lyla	Provide an additional grocery store. Provide flat fields by playgrounds. Provide a dog park.
Kathy	Provide more places to sit.
Amelia	Provide a place to talk about governance.
Claudia	Provide bike racks. Provide more community garden space.
Marie	Provide more retail space.
Helen	Make public spaces more accessible for people with mobility constraints.
Olivia	Provide more coffee places. Provide a community tea bar.
Liz	Liz likes the public space in her neighborhood the way it is. It has a pool and a park and a lot of green space.
Grace	Make the public space more welcoming to children of various ages.
Lou	Provide a green space with comfortable seating, such as picnic tables.
Ineth	Ineth would not change the public space in her neighborhood.
Whohan	Provide sheltered outdoor space and improve the local community center.

Responses summary 13: How interviewee describes perfect public space

Name	Response summaries
Nick	"I think the perfect place for the social time would be very similar to the market, but I would like to make it like a coffee shop."
Dee	"Something that I would like to see is like square dancing. It's not something that I love, per say, but that's something single people could do and be engaged with and get to know their neighbors without having to go there with a partner or a friend. Something that will bring everybody out but as a person, as an individual, and that groups can do. I guess also because I keep falling back into my role as a building manager. I see the insight of it. I see the tenants that are isolated. I see the people that don't go out there and make connections. And some it is voluntary and some of them, they just don't know how. And so I think stuff like that would lure them out and it would provide ready connections. *(Eric: So describe a place for them. What is that place like?)* It's flat. So anybody with mobility issues is not challenged by it. It's got

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	greenery around it, because greenery just always seems to add a calming aspect to it. And for some reason I keep picturing some of the plazas that I saw in Spain where you saw people playing chess, people having coffee. At one end there was a table tennis that was, a tennis table table thats always there. I like multi-modal."
Seedsaver	"It doesn't have to be a big space. It could be a small space. It might even take up some parking, so it calms the traffic. It has a shelter so protecting you from either the rain or from the sun. Has planters around. Probably edible things that you could eat all year around for seasonal interest in terms of the landscaping. It's a quiet place. It has seats that you're not confined to sitting in a certain configuration, so the seats are comfortable. I know the city--had this one time they had this wagon that came out and it had a burner or whatever and they were making hot teas in one of the public spaces. Well, maybe this place would have something like that too. You have to just bring your own--I guess, mug or whatever--and you use the water there. You bring your own tea and you could make hot drinks and sit there."
Lyla	"Michael Smith Park is just about perfect....I have toddlers....There is a non-sand side, which is way easier to clean up when we get home. There is a blend of big-kid and little-kid toy-like equipment. There're people who've thoughtfully, accidentally left shovels and buckets there. So then even if you forget yours at home there's some stuff to dig with. There is a forest adjacent--so, just bushes and trees--but it's enough for us that it seems closed off enough that you feel like you're in the--for a little kid it's like 'I'm in the forest' and it would be exciting and a place to build a fort and to play pretend. But, it's really not so thick or so dense that...I still need to keep a close eye on them....Nice big open field next to it. It's a little sloped but it's fairly flat as it goes. The things that would then make that space more perfect is if we raise the stupid little railings so that they...would...not...let a toddler fall into the water feature immediately. And then knowing that...my kid's not going to run through dog poop in the middle of that nice green space."
Kathy	"Oh, I think we need a bigger gathering place someplace. There's no gathering place that's big enough... something like what Grandview Park does for Commercial Drive, or one of the other parks. It's big enough to hold a crowd, so you can have festival events. When we have festivals here, they're so spread out you don't even know where you're supposed to go."
Amelia	"I wish that we had planned for more public spaces along the park edge, because one of my most favorite public spaces is that combination of hard space and green space that is characterized by Central Park in New York. I mean Columbus Circle--right there, you've got Columbus Circle--you've got the whole city. But then, you have those, you have statues. I mean to me, we are lacking public space in Vancouver--like, magnificent public space. I think we do green space better than we do public space....I began to think about Vancouver and I immediately went to the Vancouver Art Gallery and I hate what they've done in front of the Vancouver Art Gallery. It's so boring."
Claudia	"I think that it could be like a 2.0 playground--like a reloaded playground, like kind of like a better version of a playground with the playground in the center,

	a water park on the side and then some...pergolas or something, so the people can go and sit and have board games or whatever. "
Marie	"I'm going to go back to the piazza idea...I've really thought that that was missing in general from Vancouver neighborhoods--having spaces like that where people are out of their cars. You have to walk through. You can't drive. Just having the ability to be able to walk from your house to get the groceries that you need without having to go into a car. Then, also within that space, having different types of spaces so people can do different activities, whether it's kicking a soccer ball around or just sitting quietly, having a playground. Having enough different types of areas so that people can interact in many different ways."
Helen	"It would be accessible, it would have an area for kids, it would have something to do for the parents or for the adults rather than just sitting under a tree. Something like one of those big chess or checkers sets on the ground, something that adults can do while they watch the kids and the kids can just go off and do their thing. A fenced-off area for dogs. We have a number of dogs in our building that have to be on leashes all the time. Trees, lots of trees."
Olivia	"I would put little chairs and tables outside the Commons Block. I would have a tea or a coffee stand there."
Liz	"Lots of green space, lots of trees, and stuff for kids to do....I'm a big fan of the trees and the lawn and flowers, and maybe if there can be a communal vegetable garden....I think it's also important to be able to have some element of privacy, so when you're in your front yard, you're not necessarily on display for everybody. You can choose to enter into that communal space or you can hang out with your book an your glass of wine without having to say hi to everybody walking by. Having that--being able to be outside of your house, but also have a bit of privacy--is important as well."
Grace	"Games, tables and chairs, trees to hang a hammock. No rules other than no smoking."
Lou	"An outdoor gathering place would be ideal. Similar to what we have at the Canoe, but perhaps not within the pool deck. Like if they could add onto the Canoe Club as a patio space perhaps, would be an ideal set up. Trees obviously, shade, drinking fountain. I don't know, just the things that you need in a park I guess really is what I'm seeing because I do love this, this green space that we have around us. That's definitely part of the appeal in this community for me."
Ineth	"Yeah, there would be no cement, there would be no asphalt, there would be no amphitheater kind of a thing where bands could play or something like that. It would be grass or some kind of vegetation. It would have a dog off-leash park. It would have a little picnic area....There's a box with toys in it....Maybe a few little playgrounds there....It would have kind of little areas were sort of there maybe be some low shrubbery as sort of a little boundaries, kind of almost like creating little outdoor rooms....And it would be maybe a few benches in through there. Maybe a place where if somebody wants to put up a badminton net, or have a croquet...game, or something like that."
Whohan	"Easily assessable (to) everybody. So I'm talking mobility assessable as well as

	centrally located. Something that provides cover when necessary. Open space with some maybe play space--play space that is not zero to five, but it needs to have a little more depth. There's kids in the neighborhood are much older-- probably good 10 or 11 or 12. I think. An ability to move the furniture around to congregate the furniture that's available, because there'd better be furniture available into groups that allow for conversation and allow for bigger groups, smaller groups moving around. I'd like it to have a, would be really nice to have a store pile of sort of outdoor activity type of things, chess pieces, checker pieces, badminton rackets. Doesn't actually have to be a large space to be utilized. Right. And probably close enough to someplace where you could pick up a cup of coffee or a cup of tea or something and carry it off to that spot."

Responses summary 14: How interviewee's neighborhood public space differs from ideal

Name	Response summaries
Nick	Nick would like more space for the local flea market and to have a café nearby.
Dee	Dee's ideal space is lager and 'more adapable to different social groups.'
Seedsaver	Seedsaver's public space is missing shelter and a tea wagon.
Lyla	**-**
Kathy	Kathy would like more softscape, planters, and mature trees.
Amelia	Amelia believes there is no public space in her neighborhood.
Claudia	Claudia would like a better connection among the sitting areas, playgrounds, and water features.
Marie	Marie would like more retail and another coffee shop.
Helen	Helen would like a more accessible public space for mobility-impared people and a space that is engaging for adults.
Olivia	Olivia would like a more interesting public space.
Liz	Liz would like a town square, a vegetable garden, and an off-leash dog park area.
Grace	Grace would like more trees, chairs, and gradients.
Lou	Lou would like more peaceful public spaces without dogs.
Ineth	Ineth would like the various public spaces in her neighborhood to be connected.
Whohan	Whohan would like more seating, a play box, and a coffee shop at the local park.

Responses summary 15: Whether interviewee considers neighborhood to be dense

Name	Response summaries
Nick	no
Dee	yes
Seedsaver	yes

Lyla	'medium density'
Kathy	yes
Amelia	yes
Claudia	yes
Marie	'moderately dense'
Helen	no
Olivia	no
Liz	yes
Grace	no
Lou	yes
Ineth	no
Whohan	no

Responses summary 16: Whether interviewee considers neighborhood to be crowded

Name	Response summaries
Nick	no
Dee	no
Seedsaver	no
Lyla	no
Kathy	yes
Amelia	no
Claudia	no
Marie	no
Helen	no
Olivia	no
Liz	no
Grace	no
Lou	no
Ineth	no
Whohan	no

Responses summary 17: Whether interviewee would rather live in less dense neighborhood

Name	Response summaries
Nick	no
Dee	no
Seedsaver	no
Lyla	no
Kathy	yes

Amelia	no
Claudia	no
Marie	no
Helen	no
Olivia	no
Liz	yes
Grace	no
Lou	no
Ineth	no
Whohan	no

Responses summary 18: Whether interviewee considers neighborhood to be safe

Name	Response summaries
Nick	yes
Dee	yes
Seedsaver	yes
Lyla	no
Kathy	yes
Amelia	no
Claudia	no
Marie	yes
Helen	yes
Olivia	yes
Liz	yes
Grace	yes
Lou	yes
Ineth	yes
Whohan	yes

Responses summary 19: How interviewee thinks neighborhood could be safer

Name	Response summaries
Nick	install cameras
Dee	better social services in the downtown east side
Seedsaver	fewer vacant storefronts
Lyla	better lighting in the park and better road safety for pedestrians
Kathy	better social services for people with drug and housing issues
Amelia	provide a block watch program
Claudia	provide a neighborhood mediation program to address conflicts

Marie	keep shops open later to encourage more people to be out later
Helen	provide more police foot patrols
Olivia	keep the raccoons from getting into the garbage
Liz	reduce theft
Grace	reduce traffic
Lou	(no suggestions)
Ineth	(no suggestions)
Whohan	'more people'

Responses summary 20: Culture with which interviewee identifies

Name	Response summaries
Nick	(pass)
Dee	Black community
Seedsaver	Canadian
Lyla	Canadian
Kathy	Queer woman, Jewish
Amelia	Caucasian
Claudia	Latin
Marie	Canadian
Helen	Canadian
Olivia	Middle Eastern
Liz	Euro-Canadian
Grace	'middle class prairies'
Lou	Canadian
Ineth	environmentalists and dog people
Whohan	Canadian white

Responses summary 21: How interviewee's culture values sense of community

Name	Response summaries
Nick	"Devalue. I mean the person who did something I think is very ridiculous, devalued the sense of community. Yes. I can make an example. Every person will have waste things, like the garbage. Garbage and waste. To me, I would like to purchase a kind of a bag or use the bag to get it all and then just throw into the garbage bin, but I don't know why that every time I can witness some persons just a drop randomly, and there's some recycling color. I mean recycling things, and they never try to follow those things. They just drop it randomly."
Dee	"In a very defensive way. And partly because the lost of Hoggans Alley, and I'm aware of the community that's fighting to bring that back. There are people who's families lost their homes when they took down the buildings--so they

	have that visceral connection to what was once a black community and now isn't. It's very defensive, especially in Vancouver because we have to actively seek each other out. Yeah. So you either have to go online, find Facebook groups, because there's a Facebook group called 'Meanwhile Black in Vancouver' and that actually has been fantastic for me. I was down to literally two black friends in Vancouver, and it's not that I have the social fantasy to interact with everybody else, but I need my sisters. And I was actually like, 'god, do I have to move to Toronto? How am I going to do this?' But no, I was able to reconnect. So yeah, it's not a passive thing at all. We have to seek each other out."
Seedsaver	"I guess with the West End, they're welcoming to that. Someone whose being a welcoming neighborhood, probably because of the variety of businesses and the diversity of people."
Lyla	"I think there's a high sense of, like, maintaining space. The flip side of that is that my husband's perspective and I've sort of noticed it too now is that he finds Vancouver people pretty standoffish--that he feels like people, when he says hello to people, they don't...people won't engage with him. So yeah, Vancouver is not...we are not as nice as the Canadian stereotype--the American stereotype of Canadians. We are not as nice as that stereotype made him think we were going to be."
Kathy	"It's the absolute heart and core of queer women's lives, to kind of be together because of the history of homophobia and everyday experience. It's uncomfortable being around straight people sometimes, it's even threatening sometimes, like if you walk down the street holding a woman's hand you'll be harassed by a lot of men, chances are. Or boys, or young men especially, are the worst. So, in reaction, I think women work to create bonds and community, and what that has to do with is mostly trying to support each other--be there for each other--see people through problems--treat people kindly....Lesbians are really famous for staying friends after they break up with each other, and there's a reason for that. When you're in a limited community and you're going to be in it all your life, there's a great motive to try to be the best person you can."
Amelia	"I think they really value it and they're at a loss as to its demise."
Claudia	"If it's a funeral or a marriage,...you know we got it. We always got it."
Marie	"I think that it's fairly highly valued."
Helen	"I think we're pretty good. You know, as much as people denigrate the Trudeau name, one thing that his father did was encourage the multi-culturalism. And I think... that's one of the things that bothers me about community. People talk about the Indo-Canadian community and the Japanese-Canadian community, and I'm sorry. I don't believe in hyphenated communities. It separates us into them and us, and that creates problems. Take a look at the states and what's happening down there--when you've got the them and us. When you start separating and compartmentalizing communities, then it separates rather than integrates. And we worked so hard on multi-culturalism to make everybody feel valued as Canadians that we then separate again by, you know, Muslim-Canadians and Indo-Canadians and

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	French-Canadians and Polish-Canadians? We have Japanese, Korean, Filipino, we have a refugee family, we have Hungarian, we have several Russian families. We pretty much cover the globe."
Olivia	In Turkey, for example, people sometimes, like elderly people, or people who have seen Istanbul in those times that it was not so populated, they go like, 'We had nice neighborhoods. People would know each other, everybody would trust each other.' So people value in this culture as well this sense of community, feeling safe and knowing that the shop owner downstairs is looking after you and so on. But it doesn't happen now, especially in big cities. It's not there. Maybe in a little building, like building-wise, maybe, but not ... I haven't experienced it."
Liz	"It's not great. I think we're very... we tend to be a bit individualistic and in my experience, people can put up a lot of walls about 'Oh, everything is fine. It's great. I'm so busy!' But really things could be really difficult and it's hard to know that. And I think people are... maybe I'll change that Euro to British, because I think maybe it's a British thing, because my husband is French and he's definitely not like that."
Grace	-
Lou	"I think we used to value it more and I would like to think that some of the younger people are coming around to it again. I think in many cases it skipped a generation."
Ineth	"I wonder if they're not looking at it for the same way I am, where they look at it through an environmental lens."
Whohan	"Canadian white community is very insular."

Responses summary 22: Communities to which interviewee feels connected

Name	Response summaries
Nick	'I think all new immigrants, because I believe that we have similar problems or we came across similar situation things, yes. So sometimes we can share our feelings and also we can give other persons some suggestions and some piece of advice."
Dee	"I feel very connected to the black community here....I also have the arts community here....I've also been heavily involved in toastmasters for over 10 years."
Seedsaver	"Well, I guess arts groups, maybe. And my partner and I, where we have an allotment garden, so the people that we garden with....The other thing we do is we go to the Y, so the groups of people that ... Yeah, at the YMCA."
Lyla	"The professors on campus, the young families on campus."
Kathy	"my UBC colleagues in the English Department,...online community for female-identified queers,...Jewish Community Center."
Amelia	"the UBC community"
Claudia	"The Persian community,...the Latin community,...and...the LGTBQ community."

Marie	"A lot of our communities are really because of what our children are doing, and this has basically been from day one, I would say. So, currently, there's a hockey community outside of the neighborhood, but there is some overlap in the neighborhood as well....We know a lot of people who live in our former building, and are very good friends with one family there."
Helen	"I still associate with some of the scouting friends that I made when I was living in Kamloops....But no, the only other group that I associate with on a regular basis is my family group."
Olivia	"Acadia Park, one of them. UBC in general, like the business school that I study in."
Liz	"My neighborhood, my physical neighborhood. I have a few online communities that are pretty important to me. And I have a group of women that I first met when we first became moms that is also pretty important."
Grace	"So probably the Port Moody gym as well as my workplace....Oh, the Port Moody Curling Club."
Lou	"Okay, we're involved in the musical community here. That's a big part of it. We're members of the art center, there are other people in this community who are doing volunteer work that I'm involved in. So that whole volunteer community as well, foodie things are a big deal in the bigger community especially. So like Rib Fest or Food Truck Fest or that kind of thing. Loosely, the Community Association Group because we have a little bit of involvement with them. I think that's pretty much all in our local community."
Ineth	"I feel most connected to my condominium and my three neighbors....That's my most important little neighborhood, and then comes ... And I'd say the dog and the environmentalist (groups) are on even footing....They're tied for second. And then people my age and which I relate to far better to than young people, except those people who are environmentalists, or if they have a dog."
Whohan	"Well, clearly the heritage and the arts communities, since I'm on boards for them."

Responses summary 23: How interviewee ranks importance of communities

Name	Response summaries
Nick	"I think they're all the same importance to me."
Dee	**-**
Seedsaver	"Probably, maybe, the Y. Then, maybe, we also volunteer at the neighborhood House, so maybe that might be number two. Because that would be people that live within the community, so that's two. And probably the gardens, and then arts things that we might go to."
Lyla	"Assistant professors, women in engineering, women in science, young families, the mother/parent community, board gaming community and then my extended family."
Kathy	1. Work associates 2. Women friends

	3. Fellow Vancouverites
Amelia	**-**
Claudia	"The Latin community within Acadia Park."
Marie	**-**
Helen	**-**
Olivia	"UBC, Acadia Park, Sauder (the business school)."
Liz	"Probably, the women that I met online. They actually live in this area, so that's how we happened to meet....Those are my people....Then probably the neighborhood."
Grace	"Okay, so I have the Friday Morning Walking group that I started here....Lets rank that one second....The first one I'm going to tell you about right now. I would say that doesn't have a name, but it's a group of friends of mine that I met at the gym, but it's not about the gym.... So we've gone to classes and hikes and stuff like that for almost 10 years, and now we've come to know each other and we hang out together."
Lou	"Probably the art center."
Ineth	"I feel most connected to my condominium and my three neighbors....That's my most important little neighborhood, and then comes ... And I'd say the dog and the environmentalist (groups) are on even footing....They're tied for second. And then people my age and which I relate to far better to than young people, except of those people who are environmentalists, or if they have a dog."
Whohan	-

Responses summary 24: Interviewee's final suggestions for improving sense of community in neighborhood

Name	Response summaries
Nick	"If I had more leisure time I would definitely try to involve myself more, so that helps me to increase my sense of the community."
Dee	"The only thing I can think of is if there were more events that people came out to because when you live in high density, as well as in addition to providing the space, you actually need to put events on, I think, to draw some people out. I was saying about the challenge of being out and about with a dog, and where you can go, is we're legally not allowed to tie them up. And you've got now dogs inside the store. You want a coffee, you have to take them and leave them or illegally tie them up. I think if there were places where you could purchase from a window. I virtually walked up to drive throughs, with a dog, in order to get something to eat. So there's not facilitation of that. They're missing out on a massive, massive section of people who would take their dogs out more, go for a coffee, go sit someplace, if they could just get served without having to risk tying the dog up outside. They have meet ups with dogs. I don't know if you've seen them on meetup.com.

	There will be a meet up in this area. 'Come with your dog.' So they create spaces where more dogs can commune and people will bring, I think, food, and share. You want stuff to happen by happenstance. That's how community really builds. It's a little challenging because I love having my black community, but we really have to work hard to find each other. And it shouldn't be that hard. It's the casual encounters and all the stuff that you impromptu share, that is what actually builds friendships and communities."
Seedsaver	"Well, I guess things like the Farmer's Market, and when it's not the season. So, I guess it's from October until May, June, there's nothing really like that on a weekly basis that you run into people at the market. So it's only on the street that you might run into them. I was thinking, too, about allowing artists to use in the back lanes--some of these garages or whatever. In some places people have a little studio, but now all of those are disappearing....So they have their little electrical studio or their workshop and stuff like that. It'd be kind of neat to have a range of things like that in the neighborhood....Relax the zoning that it permits things like that in the neighborhood. It doesn't have to be, the only thing you can do is a franchise store and it has to be a certain size. What about a smaller little store?"
Lyla	"In the first building that I moved to it with staff and faculty rental housing we all knew that we were connected to UBC in some way and we had a very organized neighbor who one day took the initiative to say like bring potluck such and such day in the park. 'See you there.' And I took it upon myself to go, it was a little bit awkward because Brandon and I were initially the only non-child people there. Everybody else who was there had young kids. But then, that having gone to those events, then you know people and like the next time...you start to know them a little bit more. And so now in the building I'm in now which is...a private market building, which I think has a blend of people who have bought and lived there....If we had some similar events, that could increase the sense of community within that building. But, given the attendance at our annual strata meeting probably not because most people won't attend."
Kathy	"Because of the unaffordability of the neighborhood, there's not much diversity here in terms of wealth equality. And I find that a little isolating, actually, and unnatural. Also, our physical isolation from the rest of Vancouver kind of keeps the neighborhood from having the traffic through that other neighborhoods have....So, it would mean a lot to me if we had more, it's impossible at the end of a peninsula, but if we had more flow....more connection, more diversity, more emphasis on social life."
Amelia	"Joining the city of Vancouver. I really feel like it's becoming more and more and more obvious that we have this incredible density of people paying taxes. So if you're paying taxes, you're entitled to a governance, to real governance, not a non-profit society called the University Neighborhoods Association."
Claudia	"We need more spaces for art, like photo galleries."

Marie	"Well, now that we've opened up the whole Stadium neighborhood idea, I think in the campus neighborhoods, people have recognized that Hawthorn Place has been a success story, and one reason is because of the Old Barn as well and having this inside living room space for people to come to has been very important for building community, as well as having the big outdoor space with the playground and the coffee shop adjacent to it. I think that's what makes this neighborhood, to be honest. If you took this away, it would not be a good neighborhood. I know that sounds very simplistic but my sense is they haven't effectively recreated that in Wesbrook Place. I would say that the outdoor space and the design of it is vital to the success of the community, and one thing about the plans that they have released in terms of the design of the area, there's an implication that the new stadium is going to be ... It's implied through some of the drawings that they put out that it will be an open space that will blend in with the neighborhood and be part of the neighborhood, when I believe the reality is there's going to be a fence around it blocking it off so you will not have this gradual transition from neighborhood to stadium, and that's going to completely change the way the neighborhood could feel. If they can open up the stadium area and allow it to be part of the neighborhood and part of the public space in some way, I think that would help make the neighborhood a lot better in terms of livability and creating more possibilities for people to interact and get to know each other."
Helen	"Probably being able to get in touch with the other stratas so that maybe we could organize neighborhood things. "
Olivia	"I can't think of anything. I feel pretty connected and pretty much with a big sense of community now. "
Liz	"I don't know how this is done, but I think just that being able to get past those walls that we sometimes put up.... Being able to sort of find out how you can help them or how they can help you or beyond that surface-y stuff of "life's great." I think that would be helpful."
Grace	"More events at the canoe club that are open and that I wouldn't have to initiate, that you can just go to."
Lou	"If we had somebody that regularly put together the coffee houses that we periodically have, so we bring a bunch of musicians that live in the neighborhood. They have a coffee house, we serve treats, we have coffee."
Ineth	"I think we should have another big annual picnic....I run the dog show for it, and I love doing that, and I've been thinking about just doing that anyway. As we start out we have a little bike race for the kids, and then we have the dog show, and then we have a barbecue, and then we have some musical entertainment. It's not really complicated, but we have to get ... But it is really complicated."
Whohan	"I think that the sense of community in Moody Center is strained by opposing viewpoints that are happening. And I think that the lack of a focal group and or place that is welcoming and neutral is contributing significantly to the lack of community within the Moody Center community. And I think until we can get past and solve--and resolve--not solve the differences, but resolve the conflict of the differences, it's going to be a real challenge."

Appendix I: Site observation template

Sense of Community/Neighbourhood Density Study Site Observation

Site: Hawthorne,   Wesbrook Village,   Klahanie,   Acadia Park

Date: _____   Start time: _____   End time: _____

Location: Coffee shop, Community center, Playground, Other _____

Weather: _____

Time	# People present	# People interacting

General observations:

Site characteristics:

Protection against traffic & accidents:

Protection against crime & violence:

Protection against unpleasant sense experiences:

Possibilities for walking:

Possibilities for standing:

Possibilities for sitting:

Possibilities for seeing (fenestration, views, lighting, etc.):

Possibilities for hearing and talking:

Possibilities for playing or unwinding:

Provision of small scale services (notice boards, signs, waste bins, etc.):

Provision of design for enjoying positive climate elements:

Provision of design for positive sense-experiences:

Appendix J: Site observation results and images

Summary of site observations. The letter "p" represents people present at the location and the letter "I" represents people "interacting," which was somewhat subjective. I took counts at each location every five minutes over the period indicated. Averages are shown below. One intent was to see where people were more likely to interact. Although "playground" came out on top, it is difficult to generalize these findings. It is also impossible to gauge to what extent "interaction" might relate to building a sense of community, thus the site observations did not contribute much to this study, and I couldn't think of how a future study could do a better job of "observing" sense of community being built.

Obs #	Site	Location	Date	Start	End	average p	i	ave i/p	P C
1	Hawthorne Place	Coffee shop	10-Aug-19	10:05	11:05	8.4	1.4	17%	V6T 1Z4
2	Hawthorne Place	Community center	10-Aug-19	11:10	12:10	9.5	9.0	95%	V6T 1Z4
3	Hawthorne Place	Playground	10-Aug-19	12:15	1:15	5.2	3.8	75%	V6T 1Z4
4	Hawthorne Place	Other (community garden)	10-Aug-19	1:35	2:35	1.7	0.8	50%	V6T 1Z4
5	Wesbrook Village	Coffee shop	17-Aug-19	10:10	11:20	18.2	13.0	72%	V6S 0B1
6	Wesbrook Village	Community center	17-Aug-19	11:30	12:30	5.8	1.5	25%	V6S 0H3
7	Wesbrook Village	Playground	17-Aug-19	1:25	2:25	8.9	7.1	79%	V6S 0H8
8	Wesbrook Village	Other (water park)	17-Aug-19	2:35	3:35	5.5	4.5	82%	V6S 0H3
9	Klahanie	Coffee shop	24-Aug-19	10:45	11:45	18.2	11.2	62%	V3H 0C3
10	Klahanie	Community center	24-Aug-19			0.0	0.0		V3H 0A9
11	Klahanie	Playground	24-Aug-19	12:05	1:05	0.7	0.7	100%	V3H 5K7
12	Klahanie	Other (lawn area)	24-Aug-19			0.0	0.0		V3H 0A9
13	Acadia Park	Coffee shop	31-Aug-19	10:05	11:05	7.5	4.6	61%	V6T 1Z3
14	Acadia Park	Community center	31-Aug-19	11:25	12:25	7.4	5.6	76%	V6T 1S1
15	Acadia Park	Playground	31-Aug-19	12:50	1:50	7.6	5.5	73%	V6T 1S1
16	Acadia Park	Other (community garden)	31-Aug-19	1:55	2:55	0.8	0.5	55%	V6T 1S1
	averages	**Coffee shop**	August 2019			**11.2**	**6.4**	**57%**	
	averages	**Community center**	August 2019			**5.7**	**3.8**	**66%**	
	averages	**Playground**	August 2019			**5.5**	**4.3**	**78%**	
	averages	**Other**	August 2019			**3.7**	**2.7**	**73%**	

Table 1- Site observations

Figure 1 – Hawthorne Place coffee shop

Figure 3 – Hawthorne Place playground

Figure 2 – Hawthorne Place community center

Figure 4 – Hawthorne Place community garden

Figure 5 – Wesbrook Village coffee shop

Figure 6 – Wesbrook Village playground

Figure 7 – Wesbrook Village community center

Figure 8 – Wesbrook Village water park

Figure 9 – Klahanie coffee shop

Figure 10 – Klahanie playground

Figure 11 – Klahanie community center

Figure 12 – Klahanie trail

Figure 13 –Acadia Park coffee shop

Figure 15 – Acadia Park playground

Figure 14 – Acadia Park community center

Figure 16 – Acadia park community garden

Obs #	Site	Location	General observations
1	Hawthorne Place	Coffee shop	There is a patio area that I am excluding due to lack of visibility from where I sit. This is a warm and inviting space - open with heavy timber framing. The doors are open, letting in fresh air. The females are wearing sweaters but the males are not. A hip, international soundtrack is playing but would not disturb conversations. Several people in their 20's, but older parents with kids come and go as well. Just after ending the observation, a group of eight cyclists came in, all interacting.
2	Hawthorne Place	Community center	Spacious, with high ceiling and multiple sub-areas. A group of older Asians is playing a board game in a corner. A mother and child (toddler) are present and, in another area, a father is playing with his young children.
3	Hawthorne Place	Playground	A beautiful area with lots of trees and other landscaping. It's generally empty now. Maybe everyone is out of town or having lunch. A father has brought 2 kids for a picnic on the lawn. A teenage boy is on hand with a tantrum-prone 4-year-old. Man in suit with backpack comes through with 2 pre-teen boys on scooters.
4	Hawthorne Place	Other (community garden)	Very quiet and lush with green everywhere. A father and son came through. There's a guy resting in a chair--he seemed to be eating from the garden, but I think he may be transient. Another guy has shown up, smoking, taking photos of a plant with his phone. He doesn't seem to be gardening. A father has come with a young daughter to tend their plot. 2:30--a drizzle begins and the transient leaves. I'm sitting under trees and staying dry.
5	Wesbrook Village	Coffee shop	It's a bit cool outside, but not uncomfortable. People are sitting both inside and outside. There is a group of seven seniors at a table inside, all engaged in lively conversation. Three groups are sitting outside--a couple, a couple with small child, and a foursome of one male and three females (and a dog). The people outside seem to be in their thirties.
6	Wesbrook Village	Community center	I'm observing the front area of the community center. The center includes many spaces, including a weight room, a gym, and several special-purpose rooms (dance, meeting, music, etc.), but this is the closest thing it has to a lobby for 'hanging out.' Four Chinese older teens are sitting together at a table, eating, studying, talking, and looking at their phones. One Chinese young lady sits alone, looking at her phone. End: Some people have come and gone, all Chinese. Teens are still here and occasionally interact, but it's difficult to know who's listening to the speaker.
7	Wesbrook Village	Playground	I found two playgrounds, similar in size. The first one is empty, so I stayed at the second, which has two boys playing, no parents around. 1:50--A group of four Asian tween girls has appeared and seem to be making a video. A family has come. The boys were playing with a Styrofoam airplane, which is now stuck in a tree. They are trying to figure out how to get it down.

8	Wesbrook Village	Other (water park)	A group of families with small children has set up a portable table and some towels or blankets on the lawn. A rental car nearby suggests that some of them are from outside of the area from an area that has transit. Another couple of parents arrives, unrelated to the group. A couple in their 20's has stopped here to eat and enjoy each others' company. The sun is out now. It is a beautiful Saturday afternoon in August, but no one is at the water park. Why?
9	Klahanie	Coffee shop	Spacious and comfortable café with indoor an outdoor seating and quality interior finishes. Some outdoor areas are obscured from my view, but I can see most of the outside and all of the inside except for the people in line, who are behind a display. Sam Cooke is the current soundtrack. Most people here seem to have come to socialize but a few are alone.
10	Klahanie	Community center	The community center is part of a larger recreational area that includes a pool, gym, and related rooms. It requires a key to get in (which I don't have), but I checked several times this morning and the community center has been empty with lights off. I won't do a full observation, but just note that it is closed and unoccupied during the morning I was here.
11	Klahanie	Playground	This is the only playground in the neighbourhood. It's basically a slide. I think it's only suitable for a toddler and would only keep one amused for a few minutes. The design could only be the result of a bitterly and begrudgingly fulfilled mandate. There is some patchy grass and benches spaced far enough apart to prevent any social interaction. Several children are playing in a laneway next to the park. 12:25--a father shows up with a toddler. 12:26--they leave. 12:30--a mom with 2 young girls and a dog arrive and sit on benches. 12:31--they leave. 12:59--two young girls arrive and sit at the top of the slide and talk.
12	Klahanie	Other (lawn area)	seems to be unoccupied throughout morning--did not perform full observation
13	Acadia Park	Coffee shop	Two people upstairs and two people on the lower level are out of my field of vision. I will not include these areas in my study because I can not monitor them. The four people outside my vision are studying, not interacting. There is an outside area and I can see it from my seat. Six people are outside. Two of the people here are my neighbors and I chat with them briefly.
14	Acadia Park	Community center	It's a beautiful day outside. A group of 5 young boys (around 10 years old--their parents are not around) are playing a board game with lively and animated discussions. An Asian man sits alone nearby, listening to a program on his phone. Young adults are coming an going as part of the move-in weekend at this campus residential area. This likely skews the counts higher than usual (as with all observations, I'm excluding staff from counts). 12:15--I say goodbye to my neighbor who is moving out today. We worked together on the local neighborhood association many years ago.

Obs #	Site	Location						
15	Acadia Park	Playground	A warm and quiet August day. New students are moving in to the adjacent under-graduate housing neighborhood. There are three playgrounds in this neighborhood. This one is closest to the community center. 1pm--the group of boys that was playing in the community center previously has shown up and joined the parents and younger children who were here.					
16	Acadia Park	Other (community garden)	Beautiful sunny day. In the middle of the garden, there's a nice gazebo to sit in, shaded by the leaves of the grapevine that grows over it. No one is here now. Maybe due to the long weekend. But, it's clear that the many plots here are tended, and surely people must sometimes be here concurrently, and chat about the weather, the garden, their studies, or something. 2:15--My neighbor and colleague Lauren shows up. She says that more people come during watering times (morning and evening). Lauren is heading off to Salt Lake City for a couple of months. It's nice to catch up with her.					

Table 2A – Site observations

Obs #	Site	Location	Protection against traffic & accidents	Protection against crime & violence	Protection against unpleasant sense experiences	Possibilities for walking	Possibilities for standing	Possibilities for sitting
1	Hawthorne Place	Coffee shop	indoor space	several customers present	area is enclosed and protected from the environment	area fronts a major pedestrian thoroughfare	there are two counters available to stand and drink a beverage	primary use
2	Hawthorne Place	Community center	indoor space	While open to the public, the space seems to be used only by locals. Books and toys are freely available. There are no signs of vandalism.	Indoor space protected from elements. Multiple areas for sitting if one wishes to avoid interaction, but poor acoustic dampening, making the space noisy if conversations or child play become animated.	Little, except for a toddler (then, ample).	not much	multiple locations to sit in groups of up to six

3	Hawthorne Place	Playground	There is only one vehicle road nearby. It is not very active and there is planting blocking kids in play area from getting to it.	good visibility, few places for criminals to hide and not much to steal. It's a peaceful place and tranquil without kids.	Several shaded areas and excellent visual screening from limited traffic. Some areas for protection against wind.	Fronts a major pedestrian thoroughfare and has a walking path at adjacent park.	One could stand and watch one's children play.	Several benches and generous lawn area.
4	Hawthorne Place	Other (community garden)	closest vehicle access is a parking lot. Area fronts a pedestrian thoroughfare.	somewhat isolated, so potential for attach, but nothing to steal (other than vegetation) and no sign of vandalism or danger.	some shade and protection from wind	available but restricted by planting beds next to walkway	some plantings on lattices, so can be attended while standing	a few chairs and benches, but not arranged for communicating
5	Wesbrook Village	Coffee shop	separated from street by parked cars, bollards, and sidewalk	good visibility with transparent storefront opposite across street	small tree and surrounding buildings for shade and wind protection. Pleasant indoor seating area with high-quality finishes	some open spaces outside in patio area fronts sidewalk	one raised counter at which to stand and eat/drink	many seats inside an outside. Inside table fits 11, outside tables fit two easily and up to four
6	Wesbrook Village	Community center	indoor space, fully enclosed	high visibility with curtain walls on 2-1/2 sides. Front desk is adjacent and staffed with two people.	conditioned space.	Ample space to move around, adjacent to walkway and water park	there is a high counter where one could stand and talk, read, or look out the window	counter seating or low seating in groups of three or four

7	Wesbrook Village	Playground	complete separation from traffic	area visible from several residential windows	one canopy for protection from rain--some trees for shade--area surrounded by buildings for wind protection	many paths nearby and one path running through the playground	not much to do standing	several benches around, each of which could fit two or three people, but no provision for interaction
8	Wesbrook Village	Other (water park)	A sidewalk and a lawn area separate the water park from the street	Area is open with good visibility and several directions in which to leave	Area is fairly open to the elements	A concrete band surrounds the water park	Little reason to stand	Benches placed in a semicircle around park offer seating for up to 24, but limited opportunity for group interaction
9	Klahanie	Coffee shop	Indoor area, fully enclosed. Outdoor area separated from traffic by sidewalk	Many people about.	Indoor enclosed. Background music. Outdoor has many trees and an umbrella.	Indoor aisles are not crowded. Outdoor area at corner of two sidewalks with low vehicular traffic.	There is a high counter but the space is taken up with high chairs (no room left for standing)	ample seating available inside and out
10	Klahanie	Community	indoor	locked	controlled environment	within walking distance of entire neighbourhood	there's a counter	many, comfortable looking
11	Klahanie	Playground	Fronts a very quiet an small local street and is buffered by vegetation	surrounded by residences with windows facing park but a user might feel vulnerable at night due to isolation.	shade available protection from harsh wind due to surrounding buildings.	small lawn area and adjoining sidewalk	no real reason to	several 2-person benches but only two are close enough for a group to interact

#								
12	Klahanie	Other (lawn area)	separated from street by sidewalk	highly visible, easy to escape	minimal shading	open lawn area suitable for dog play, ball play-- connected to sidewalk system	you could	minimal--two benches at edge of park
13	Acadia Park	Coffee shop	indoor space surrounded by walkways-- does not face street	high visibility area with people around	inside area conditioned, outside covered	fronts a walkway	none really	many options for individual or group seating
14	Acadia Park	Community center	indoor area, building separated from traffic	high visibility, many people present, including staff	conditioned space, but with poor sound dampening	there are walking aisles inside and walkways outside	there is a counter for interacting with staff	comfortable seating arrangements that allow for interaction
15	Acadia Park	Playground	fronts only one very quiet, dead-end street and separated by a chain-link fence.	highly visible with many ways to leave and multiple parents on hand	many trees to provide shade but no protection from rain	playground sits at corner of two walkways	just standing on the play equipment	benches positioned in the usual playground configuration (at the four corners) and my picnic table, which happens to be here today, where I'm sitting.
16	Acadia Park	Other (community)	Completely isolated from traffic	a bit isolated, but within short distance of the community center	blocking from wind, trees provide sound absorption. generally a tranquil place to be	aisles between plots, adjacent walkway	none, but possibilities for stooping to work on garden	really, just the gazebo (or on a rocking horse for a small child)

Table 2B – Site observations

Obs #	Site	Location	Possibilities for seeing	Possibilities for hearing and talking	Possibilities for playing or unwinding	Small scale services	Design for positive climate elements	Design for positive sense experiences
1	Hawthorne Place	Coffee shop	space is surrounded on three sides by glazing, roughly 1-3 meters a.f.f., providing excellent views of outdoor green space.	excellent, music in background allows normal conversation and helps mask it for privacy	one could play board games, rea, or talk	café, atm, waste disposal. Washrooms nearby	climate control available, protection from weather (indoor), doors (currently open) at opposite walls allow for cross-ventilation	sight--clean, high-quality construction with excellent exterior views; smell--coffee, food; sound--pleasant music; taste--good food drink; touch--comfortable seating & wood tables
2	Hawthorne Place	Community center	full-wall glazing along two walls with views of green space.	good, but poor privacy	Excellent play opportunities for toddlers (toys available). Table for seniors to play board game. Limited options for others.	toys, books, piano. Washrooms nearby.	excellent visual access to outside allows visual experience of weather events (sun, rain, wind, etc.)	touch--comfortable seating; sight--excellent views and natural light, clean, high-quality environment; sound--piano, sound system, mostly quiet; smell--none; taste--none

#	Location	Type						
3	Hawthorne Place	Playground	Good visual access to playground from many sitting areas.	A water feature provides some sound masking. Also, physical separation of benches provides some privacy. Generally, a quiet area (aside from one frantic child).	Play equipment for kids approximately 3 to 10 years old. Lawn area for relaxing or ball throwing or frisbee. Trees for climbing.	Waste bins, washrooms nearby	Trees and lawn to enjoy sun, open areas to enjoy breeze.	sight--abundant greenery; sound--quiet, birds, kids; smell--fresh air; taste--no; touch--lawn & other natural surfaces
4	Hawthorne Place	Other (community)	garden surrounded by forest - view across garden limited by plantings	quiet area and large enough to find privacy if desired.	limited for playing but unlimited for unwinding if you like to garden and have a plot	shed and compost bin, homemade signs designate individual plots	generally open to enjoy sun and breezes	sight--beautiful greenery; sound--quiet (except whistling of nearby ventilation fan); smell--vegetables, soil, flowers; touch--plants, soil, wind, sun; taste--fresh vegetables
5	Wesbrook Village	Coffee shop	possible to see almost all of inside and outside seating areas, possible to see across street and partially down adjacent perpendicular street	Light music in background (currently Benny Goodman's version of "sing sing sing") allows some conversation masking but can also easily be ignored	kids could play a bit in the outside patio	waste bins and café-related conveniences	variety of outdoor seating locations	sight--greenery and high-quality interior and exterior finishes; smell--coffee and pastries; taste--craft baked goods, beverages; sound--pleasant music and low din of conversation; touch--living edge counter with poly finish

6	Wesbrook Village	Community center	excellent views out to adjacent buildings and walkway but part of view is to parking lot. Minimal visual access to rest of center.	It is very quiet here with only slight noise of HVAC to mask conversations.	Opportunity for quiet board games but nothing active.	Waste bins with recycling, water fountain and washrooms nearby	Could be enjoyable place to be out of rain or enjoy sun without discomfort of excessive temperature	touch--some comfortable chairs but overall a sparse and cold environment; smell--none; sight--views outside; sound--none; taste--none
7	Wesbrook Village	Playground	beautiful views all around	quiet with faint sound of running water but seating is poorly situated for adults to interact. Playground allows for child interaction.	multiple options for child play--benches for relaxing or watching children	trash/recycling bins available--no washrooms	benches and lawn for outdoor seating and play	touch--play equipment offers tactile experience; smell--fresh air; sound--water running, child play; sight--abundant greenery and kids playing; taste--none
8	Wesbrook Village	Other (water park)	Open views to surrounding community center, apartments, high school field, and empty lot	quiet space with sound of water features in background	primary purpose--water play when weather is suitable. Lawn available for relaxing.	drinking fountain and waste bins. Washrooms at community center nearby	ideal for small kids to play in water on a hot day	sound--pleasant sound of falling water; touch--water; smell--fresh air; taste--none; sight--water fountains, trees, buildings with quality facades

#	Location	Type						
9	Klahanie	Coffee shop	curtain walls at two walls from 30" a.f.f. to 9 feet	Music has stopped, so conversation masking is reduced but easy for several people to be in a conversation	some room for kids to run around outside. Toddlers currently walking about inside. Places available for interaction and solitary relaxation.	waste bins and items for coffee	outside area can allow for breezes and shade. Inside allows views out from all seating points	sight--beautiful area inside and out, greenery and quality finishes; sound--pleasant music and sounds of conversation; smell--coffee and food; taste--coffee and food; touch--seating is a bit hard but air temperature is comfortable
10	Klahanie	Community center	window walls provide views to street and pool	quiet environment	part of recreational center, including pool and basketball court	kitchen and waste bins available	views out	(did not have access)
11	Klahanie	Playground	lovely setting with views of trees and shrubs all around. Behind trees, 3-story buildings with quality finishes.	very quiet, easy for conversation	limited, though this is the purpose. Small, shabby lawn and playground with one slide	none	nice place to sit on a warm day, trees, benches	sight--greenery all around; sound--very quiet; smell--fresh air; touch--comfortable bench, nice breeze; taste--none
12	Klahanie	Other (lawn	open views all around	no restrictions	open lawn available for play	none	open lawn for sunbathing or other activities	touch--lawn; smell-air; sight--greenery and buildings with quality finishes; taste--none; sound--none
13	Acadia Park	Coffee shop	views out at two walls to attractive outside residential areas	There is the din of a fan in the background but it's quiet enough to not disturb conversation.	There are tables for board games if you brought one. Outside, you could sit and watch kids run nearby.	waste bins, washrooms, coffee service items	views out from inside, outside protection from sun, rain, and wind	sight--decent finishes, but not great (more institutional than homey); smell--coffee and food; taste--coffee and food; touch--comfortable seating; sound--quiet, except for the fan

14	Acadia Park	Community center	one window wall allows view to play field outside	conversation is easy but little conversation masking available and area could be noisy with many conversations	low tables can be used for games (as boys are using one for) or for toddlers to use for support (as one is doing now). No games are kept here, though. Large field and playground outside.	drinking fountain, washrooms, and trash/recycle bins available. Staff usually on hand as well.	view outside. Also convenient to use community center amenities if one is playing outside.	taste--none; smell--none; sound--opportunities for conversation; touch--conditioned environment and comfortable seating; sight--beautiful view outside to greenery but interior finishes dated and industrial
15	Acadia Park	Playground	lovely views of trees and attractive 2-3 story buildings all around, and the sky above	a couple of moms are sitting on the wood curb that surrounds the play area and are chatting occasionally. Separated benches make sitting and talking difficult	unless it's raining, a great place for kids up to teen years (and parents) to play. Not much for teens and seniors to do.	none, but community center nearby	lawn, benches, and play structure to enjoy good weather	sight--greenery all around; sound--kids playing; touch--lawn for sitting (when dry) and play equipment, tanbark (for toddlers); smell--fresh air; taste--none
16	Acadia Park	Other (community garden)	trees mostly block any views out of the garden, but views within garden are all of plants and flowers	very quiet and possible to have private conversations	limited for playing but ideal for those who find gardening relaxing	there is a large bin for compost	wonderful place to enjoy a sunny day	sight--lovely greenery all around; smell--plants, earth, compost; sound--it's pretty quiet here; touch--the gazebo bench is actually not that comfortable. Dirt, plants, bugs; taste--whatever is ripe

Table 2C – Site observations

Appendix K: Density quintile examples along Dunbar transect

Figure 1 – Example of very low density neighborhood

Figure 2 – Map of very low density areas in Vancouver (highlighted)

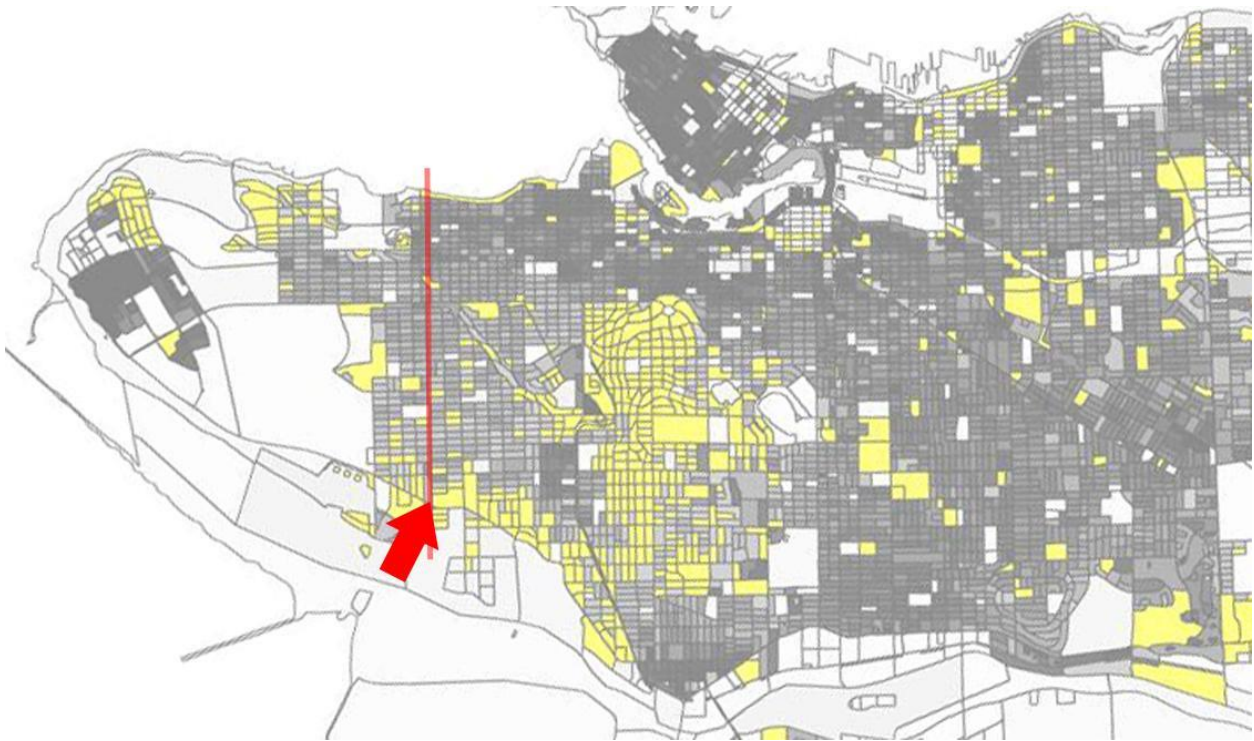Figure 3 – Example of low density neighborhood

Figure 4 – Map of low density areas in Vancouver (highlighted)
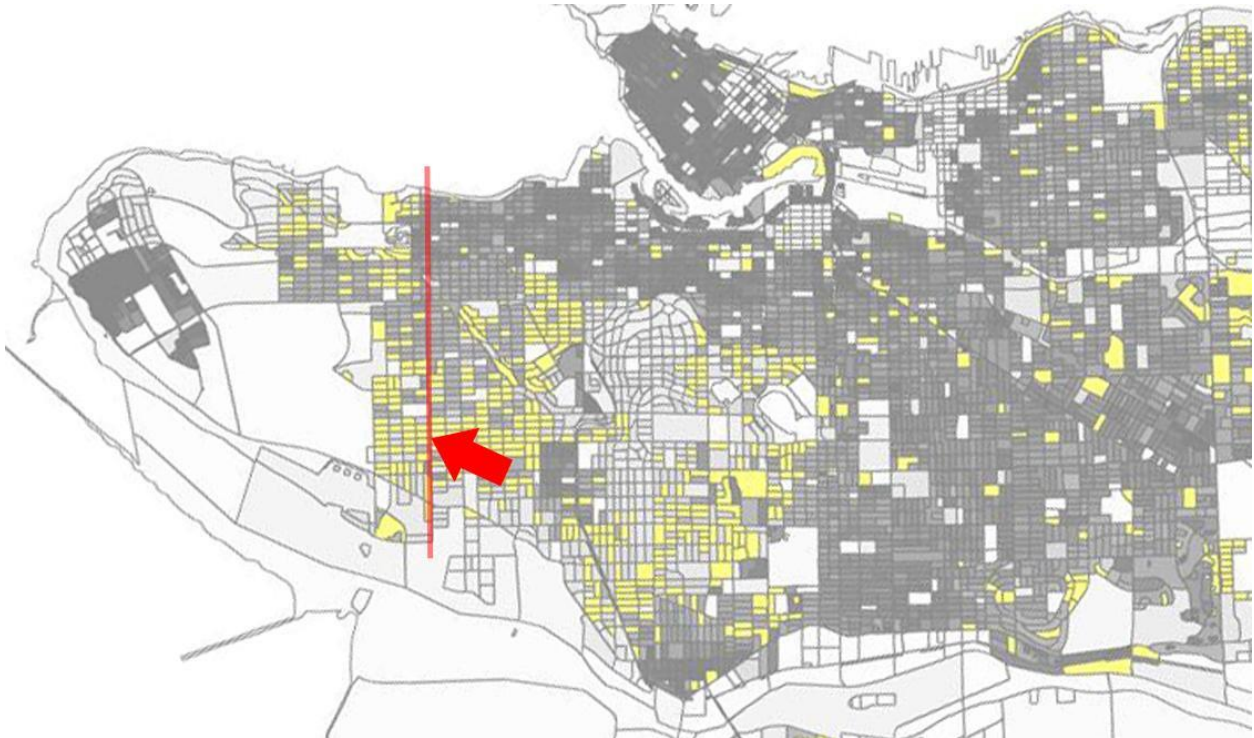
Figure 5 – Example of medium density neighborhood

Figure 6 – Map of medium density areas in Vancouver (highlighted)
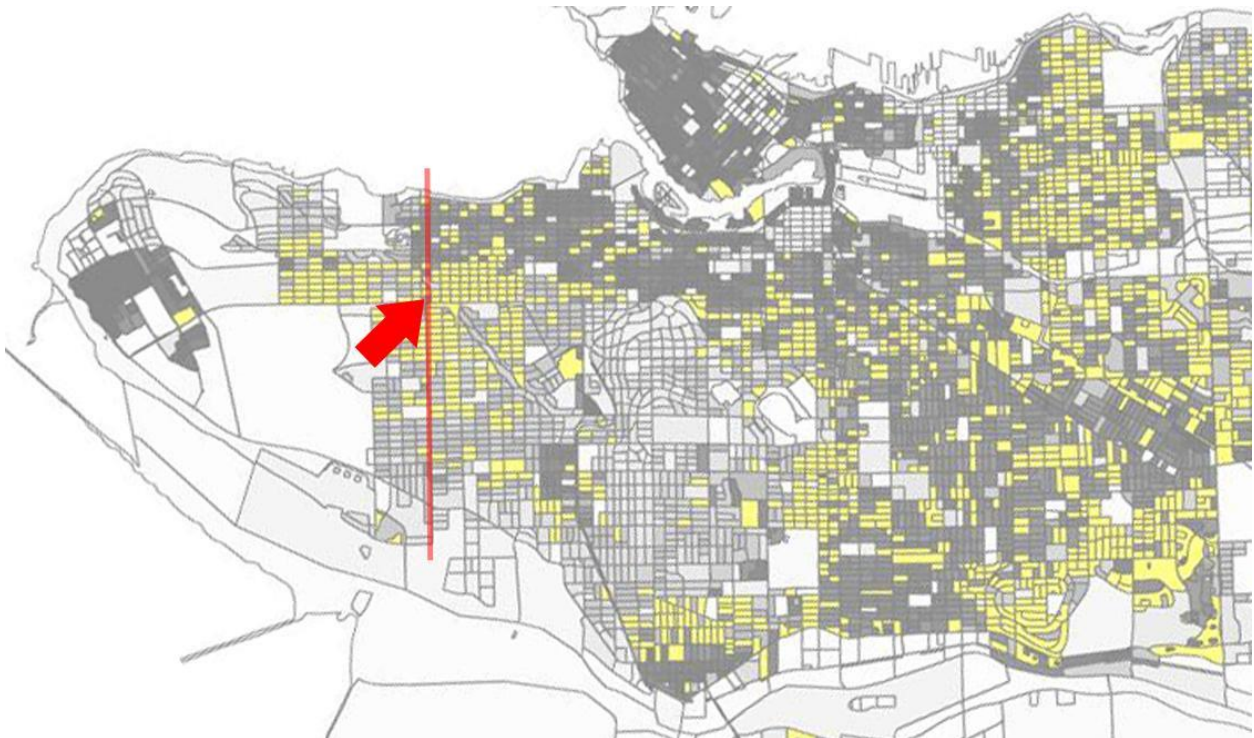
Figure 7 – Example of high density neighborhood

Figure 8 – Map of high density areas in Vancouver (highlighted)

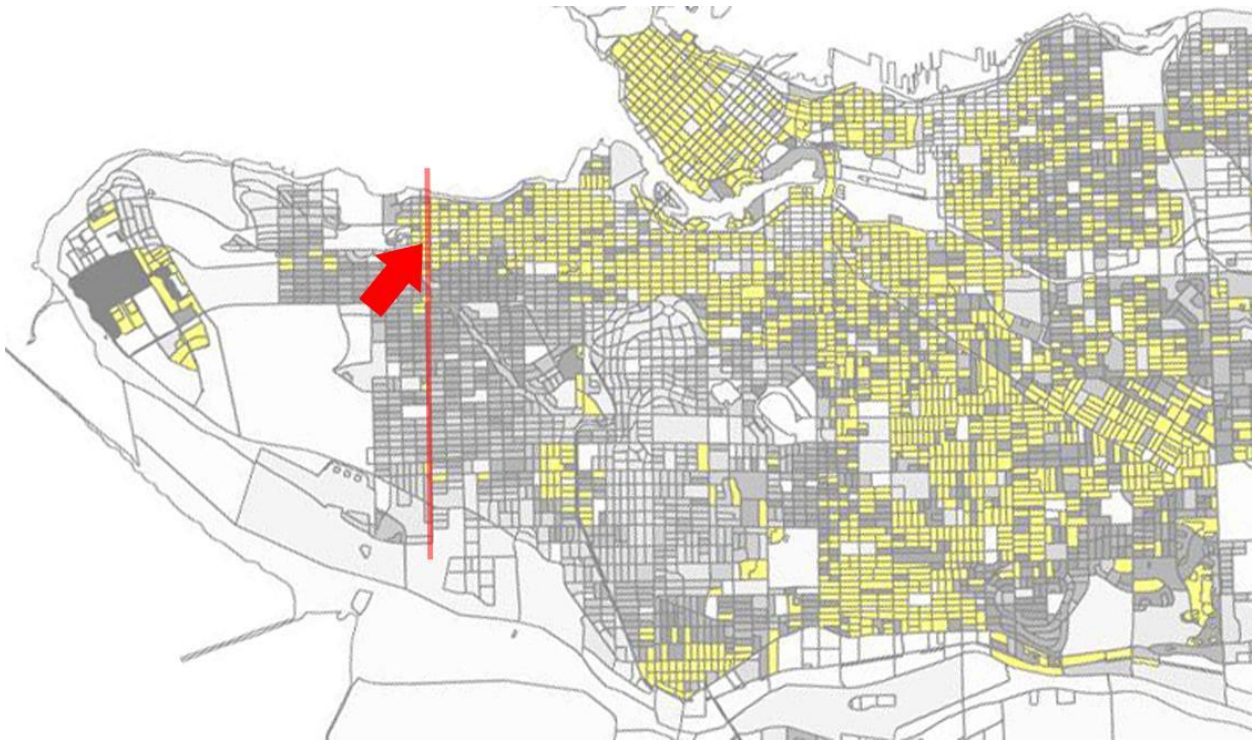Figure 9 – Example of very high density neighborhood

Figure 10 – Map of very high density areas in Vancouver (highlighted)

Appendix L: A discussion of case study research

Note: The discussion that follows in this appendix is adapted from the prospectus for this study.

Case study research can accommodate a number of epistemological approaches, including post-positivistic, phenomenological, or a combination of both (Sharp et al. 2012). Case-study methodology is appropriate for this study because it shows the relationship between the built environment and perception within a complex context that controls for several variables. Although case study research is common in several fields, including many in the social sciences, few authors discuss it as a methodology. Since this research may be considered a case study, it is useful to briefly discuss what a case study is, what its particular values and limitations tend to be, and considerations for using it.

Definitions

The familiarity of the phrase "case study" belies the difficulty of drawing a clean and simple delineation between what is and what is not included in this type of research. Berbary (2014) describes a case study as research in which "a researcher explores a bounded system in order to gain in-depth understanding and illustrate the nature of a problem or issue in context," but this might also be true of non-case-study research. According to Simons (2009, p 21, as quoted in Thomas 2011, p 512), a case study is "an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program or system in a 'real life' context." Again, this definition could fit other types of studies as well. Gerring (2004, p342), hoping to bring clarity to what he considers the "definitional morass" surrounding the term "case study," offers the following definition: "an intensive study of a single unit for the purpose of understanding a larger class of (similar) units," wherein a unit connotes some spatially and temporally bounded phenomenon. He also provides the following nested definitions:

"A 'population' is comprised of a 'sample' (studied cases), as well as unstudied cases. A sample is comprised of several 'units,' and each unit is observed at discrete points in time, comprising 'cases.' A case is comprised of several relevant dimensions ('variables'), each of which is built upon an 'observation' or observations."

Thus, a graphic representation of Gerring's definitions might look like this:

				Variable1	Variable 2	Variable 3
Population	Sample	Unit 1	Case 1	*Observation*	*Observation*	*Observation*
			Case 2	*Observation*	*Observation*	*Observation*
		Unit 2	Case 3	*Observation*	*Observation*	*Observation*
			Case 4	*Observation*	*Observation*	*Observation*
	Not Sample		Unstudied Cases			

Table 1 Relationship of terms used in case study research (based on Gerring 2004, p 342)

Although Gerring's sub-definitions are consistent and detailed, they still involve some ambiguity (could the words 'case' and 'unit' be switched?). Also, they seem not to have been adopted in later literature. Thomas (2011) defines "case studies" as

> "analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods. The case that is the subject of the inquiry will be an instance of a class of phenomena that provides an analytical frame—an object—within which the study is conducted and which the case illuminates and explicates."

This definition seems, to me, the clearest definition for case study that I've found. Unfortunately, it relies on the definition of the word "case," which then requires its own operational definition.

Finding a useful definition for the word "case" is also problematic. After reviewing relevant literature for a suitable definition, Dumez (2015, p 46, 47) found the following offerings:

- a singularity, defined by a boundary,
- a story with a message,
- a fuzzy reality with autonomously defined complex properties, and
- an historical entity as it persists through time.

Such definitions lack useful specificity. Lund (2014) (not referenced by Dumez), defines a case as

> "an edited chunk of empirical reality where certain features are marked out, emphasized, and privileged while others recede into the background. As such, a case is not "natural," but a mental, or analytical, construct aimed at organizing knowledge about reality in a manageable way."

While the data for the present study may, in time, become "an edited chunk of empirical reality," this moniker may not necessarily serve to distinguish it from chunks of other types of research in any meaningful way. Although Gomm's (2000, p 2, as quoted in Thomas 2011, p 512) definition of a case as 'a boundary around a place and time period' is not much more precise, at least it sounds a bit more elegant, and, from what I've found, is at least as precise as any other. Thus, some amalgam of Thomas and Gomm may produce the most comprehensive definition of what a case study is, and might read something like the following:

an analysis of some person, group, event, condition, situation, entity, environment, phenomenon, or effect, bounded in time and space, that serves to illustrate some idea, principle, concept, problem, solution, or ideal that may find application elsewhere.

Until a better definition becomes apparent, this working definition will represent the meaning of 'case study' for the purposes of this research.

Value

According to Yin (2014), case study research is appropriate for studies that focus on "how" or "why" questions, that involve little or no control over events being studied, and that focus on current phenomena. He notes that a strength of case study investigations is the ability to draw from several sources of information, including documents, artifacts, interviews, and observations. Brown (2008) notes that case study research, by using multiple sources of data, is often able to cover a broader range of issues than are other methodologies. Advantages of case

study research over other approaches include the inclusion of context (as opposed to experimentation, which seeks to de-contextualize (with a view to generalization)), currency (as opposed to historical research, for which application may be limited to the past), and breadth of scope (as opposed to survey-only research, for which brevity and structure are important) (Yin 2014). Priorities for the current study align with these strengths.

Limitations

Case study research also has specific limitations that researchers must take into consideration and address. Case studies are subject to many types of ambiguities. Researchers can greatly diminish this ambiguity by carefully specifying what the study is intended to accomplish (Gerring 2004). Case studies also tend to involve a smaller sample size than other types of research. Since case studies often collect an insufficient volume of data to produce statistically significant results, it is important to anticipate and describe rival explanations to the hypothesis before collecting data in order to strengthen the validity of the findings (Yin 2014). The size of the sample also influences the nature of the findings. Case studies, especially single-unit case studies, tend to be more suited to exploration than to confirmation, though case studies, especially multi-unit case studies, can offer strong evidence to confirm or disconfirm a hypothesis (Gerring 2004). While a case study cannot *confirm* a theory, it *can* either refute it or establish its plausibility (Dumez 2015). Often, this capacity is sufficient for a research project to be successful. Finally, though it is often associated with qualitative data, case study research can be limited to quantitative evidence and needn't engage in 'thick description' (Yin 2014). While case study research involves several limitations, the one for which it is most often criticized is the challenge of producing generalizable findings. However, researchers have found several strategies to address this problem.

Generalization

Research that has no application beyond its own context rarely has value. Case study findings, then, must usually apply, in some way, to cases beyond the ones studied if they are to be useful. This application is not always clear. However, Thomas (2010, p 576) argues that the difficulty in inductively generalizing case study findings is not a fatal flaw, but rather a challenge shared by most, if not all, social science studies. He notes that "the goal of social scientific endeavor, particularly in the study of cases, should be exemplary knowledge unselfconsciously based on abduction" (or, "inference to the best explanation") "gained and offered through phronesis rather than through theory." He claims that case studies in the social sciences, along with other social science studies, tend to offer "probabilistic generalization" rather than the type of rational induction produced by controlled laboratory experiments.

Since case studies generally do not allow for true experimentation using control groups, it is important for a case study to have a solid theoretical foundation in order to provide an argument for generalization. Such theory will allow for an analytical generalization where a statistical generalization may not be feasible (Yin 2014). Analysis of a case study should clearly delineate what characteristics and qualities the researcher considers distinctive to the case and which are indicative of trends in the population (Gerring 2004). According to Lund (2014), case studies should have "resonance" with other cases beyond the area of study, meaning that similar

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elements, dynamics, and relations should be recognizable between the area of study and cases within the broader field of inquiry. Case studies may compare findings within units of consideration, between units, or a combination of both. They may also compare a single condition as it changes over time, but an observation of a single unit at a single point in time offers no evidence of causal relationships and thus has little generalizable value (Gerring 2004). Also, the external validity of multiple-case designs, even "two-case" designs, using the logic of replicability (similarity of cases), tends to be easier to argue than that of single-case design case studies (Yin 2014). Thus, single-case designs, while feasible, are specially challenged to produce generalizable results.

The stated context of a case study is particularly important. According to Wieviorka (1992, p 160, as quoted in Thomas 2011, p 513), "for a 'case' to exist, we must be able to identify a characteristic unit....It is significant only if an observer...can refer it to an analytical category or theory....If you want to talk about a 'case,' you also need the means of interpreting it or placing it in a context." Lund (2014, p229) emphasizes the need to generalize, abstract, conceptualize, and broadly apply the findings of case study research to related situations, based upon the theoretical constructs the researcher has chosen. He notes that

> "generalization is an attempt to see resonance with events and processes, largely at the same level of abstraction but in different temporal or spatial contexts. Abstraction, in turn, is an attempt to identify inherent de-contextualized qualities or properties in the studied events. Theorization, finally, is about moving from observation of empirical events, *through* concepts, to be able to say something about the inherent qualities and dynamics in contexts *other* than the ones studied....The litmus test for any social science research is to what extent the findings and statements at various levels of abstraction and generalization are plausible" (emphasis his).

The burden is clearly on the researcher to state, at the outset of the investigation, what the case study may exemplify, how it should do so, and how the reader will know if it has succeeded.

Process

The aforementioned considerations, of course, are only useful if they can be applied to a process and not just to a concept. Unfortunately, there is no standardized design process for case study research (Yin 2014).

Some researchers have offered conceptual guidelines. Dumez (2015, p43) suggests that case studies must address three fundamental questions, namely, "what is my case a case of?" "what is the stuff that my case is made of?" and "what can my case do?" According to Thomas (2011), "for the study to constitute research, there has to be something to be explained (an object) and something potentially to offer explanation (the analysis of the circumstances of a subject)." This explanation may use both formal units—those chosen for intensive study—and informal units—those units that are peripheral but pertinent to the study (Gerring 2004). There are a few researchers (such as Yin and Stake) who have written books about case study research, but, as a methodology in the social sciences, there is little accepted unanimity as to the general procedure of forming case study research.

This lack of consensus (or even discussion) is particularly noteworthy with respect to case selection. Sharp et al. (2012), in response to what they consider a lack of rigor in case studies describing their criteria and process for site selection, provide a description of the method they use to select sites for their study. Flyvbjerg (2006, p 230) suggests the following approaches to selecting relevant cases for consideration:

Type of Selection	Purpose
A. Random selection	To avoid systematic biases in the sample. The sample's size is decisive for generalization.
1. Random sample	To achieve a representative sample that allows for generalization for the entire population.
2. Stratified sample	To generalize for specially selected subgroups within the population.
B. Information-oriented selection	To maximize the utility of information from small samples and single cases. Cases are selected on the basis of expectations about their information content.
1. Extreme/deviant cases	To obtain information on unusual cases, which can be especially problematic or especially good in a more closely defined sense.
2. Maximum variation cases	To obtain information about the significance of various circumstances for case process and outcome (e.g., three to four cases that are very different on one dimension: size, form of organization, location, budget).
3. Critical cases	To achieve information that permits logical deductions of the type, "If this is (not) valid for this case, then it applies to all (no) cases."
4. Paradigmatic Cases	To develop a metaphor or establish a school for the domain that the case concerns.

Table 2 Strategies for selecting cases (Flyvbjerg 2006, p 230)

This table provides a helpful summary of suggestions for how to select cases based upon the intent of the research design. Unfortunately, aside from this guidance, the process of selecting cases for study seems to have received little attention in academic literature.

Finally, given the known (or assumed) methodological shortcomings of case study research, it would be helpful to provide a summary of suggestions for ensuring the validity of case study findings. Unfortunately, again, there seems to be a paucity of instruction. Yin (2014), however, does present a set of tactics for addressing research validity in case studies. I show these in the following table (some parts of this are addressed above as well).

TEST	TACTIC	PHASE
Construct validity (measures match concepts)	Use multiple sources of evidence Establish chain of evidence Have informants review draft	Data collection/ Composition
Internal validity (relationships are plausible)	Do pattern matching Do explanation building Address rival explanations Use logic models	Data Analysis
External validity (generalizability)	Use theory in single-case studies Use replication logic in multiple-case studies	Research Design
Reliability (Replicability of study)	Use case study protocol Develop case study database	Data Collection

Table 3 Case study validity tactics (adapted from Yin 2014, p 45 & 46)

Given the lack of formal direction on the topic of case study research, it may be that critically reviewing the effectiveness of several case studies similar to the one that a researcher is planning is the best approach to ensuring rigor. Unfortunately, this, in itself, could be a rather time-consuming process that falls, as with the present study, outside the constraints of the resources available.

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