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Using Social Media to Engage Toronto Communities for Resiliency and Stress Planning

by

Martha Ta

BA Psychology, Ryerson University, 2017

THESIS

Submitted to the Department of Psychology

in partial fulfilment of the requirements for

Master of Arts in Community Psychology

Wilfrid Laurier University

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## **Abstract**

As Toronto's low-income areas grow, the city's neighbourhoods experience a segregation by low- and high-income, contributing to chronic stress as environmental determinants and leading to negative health outcomes and chronic diseases. This study identified Crescent Town as one of the Toronto neighbourhoods with potentially high levels of chronic emotional stress through an analysis of emotions indicated by Tweets, as well as triangulation with administrative data describing relevant neighbourhood indicators. Crescent Town community members (n=23) were engaged using concept mapping to identify existing neighbourhood stressors and assets and empowered to strategize solutions. The ten-cluster solution created with six clusters describing neighbourhood stressors and four clusters describing neighbourhood assets resulted in two potential strategies, a Crescent Town Residents' Association and a community fair to promote neighbourhood resources and build social networks. This piloted methodology ultimately cultivated an opportunity for neighbourhood members to continue collaboratively planning asset-based solutions for resiliency and stress.

## **Acknowledgements**

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## Preface

This research is nested in the work of my thesis advisor, Dr. Ketan Shankardass, and his collaborators', who used the EMOTIVE ontology to contribute to their ongoing research on environmental stress through a project titled *Stresscapes* (Sykora et al., 2015). As this tool has not yet been coupled with action-oriented research to impact communities, community engagement and empowerment were the focus of this research study. Thus, as a Community Psychology student I was responsible for and focused on Phase 2 of this study, in which we piloted the use of concept mapping to engage and empower community members to strategically plan for resilience and stress.

With the experience I have living, learning, volunteering and working in Toronto, I have learned about the capacity communities have in impacting inequitable health conditions. This has undoubtedly influenced my decision to continue my education in Community Psychology to build upon the knowledge from the general traditional undergraduate psychology degree I obtained and consider an approach beyond the individual. Instead of suggesting that negative health consequences are solely the result of an individual's choice and thus, focusing on individual behaviors, community psychology considers the power in collective impact and engagement into creating sustainable change (Nelson & Prilleltensky, 2004). These values and beliefs I have shared impact the study's focus on community engagement and empowerment as a result.

## **Chapter One: Introduction**

### **1.1 Background and Rationale**

In recognizing the many negative health outcomes and chronic diseases that can arise from chronic stress (Shankardass, 2012), this study aimed to pilot a method to identify, engage, and empower a Toronto community to strategize solutions for neighbourhood chronic stressors. Toronto neighbourhoods are particularly important to engage due to the continuing trend of neighbourhood segregation by socioeconomic conditions in the city (Hulchanski, 2010). The City of Toronto faces a polarization of low- and high-income neighbourhoods as middle-income neighbourhoods decline and shift to the category of low-income (Hulchanski, 2010).

Income inequality has multifaceted effects as explained by Solar and Irwin (2010). Among some of these effects, at a micro level, income inequality creates an emphasis on social hierarchies and less economic resources for the low-income population. At a macro level, income inequality impacts collaboration, reduces trust and civic participation, and leads to a decline of investment in social and environmental conditions that can all contribute to chronic stress. These effects can all result in negative health outcomes and chronic diseases for neighbourhood users, including residents, employees, and business owners (Shankardass, 2012).

These communities may face structural health inequities that impact their health (Solar & Irwin, 2010), which are “systematic, socially produced (and therefore modifiable) and unfair” (Whitehead & Dahlgren, 2006). Some communities may be resilient and can use existing assets to adapt to these structural health inequities. Other communities can also

develop community resilience to take collective action against these health inequities (Magis, 2010). Community voices can be empowered and heard by community and government organizations and urban planners to collaboratively influence transformative change. This action-oriented study empowers community stakeholders to strategize solutions to impact change within their community, home, and work settings through the collaboration of community members and academic researchers.

As this study followed a sequential mixed-methods research design, Chapter One will provide an overview of the literature on chronic stress, resilience, and empowerment, including the definitions, conceptual frameworks, and past research used to inform this study. This chapter will also provide a background of the study's methodologies, including the use of an analysis of emotions of Twitter Tweets, a Community Advisory Board (CAB), and concept mapping. Lastly, Chapter One will state the research questions and objectives this study aimed to accomplish.

Chapter Two will detail a summary of the two research paradigms used to guide this study, social constructivism and pragmatism. This chapter will also describe the study methodologies through two phases. The methodology of Phase 1, which was led by my thesis advisor, will include the analysis of chronic emotional stress of Twitter Tweets and following, the triangulation of the Twitter findings and administrative data to identify one Toronto neighbourhood. Following this, I will include a literature review regarding the identified neighbourhood and previous stress and resilience research done related to the identified neighbourhood. Phase 2, which I was responsible for, will describe the

engagement with the identified neighbourhood, including the CAB and the neighbourhood members through the use of concept mapping.

Chapter Three will detail the findings of the engagement with the CAB and the results of the concept mapping process with neighbourhood members. The clusters of neighbourhood chronic stressors and assets produced through concept mapping will be described, as well as the process of strategizing to reduce or improve some of the identified chronic stressors by building upon assets of the neighbourhood.

Chapter Four will consider the significance of the findings of Phase 1, identifying one of the Toronto neighbourhoods that is experiencing high stress and low resilience and Phase 2, the engagement and empowerment of neighbourhood members to reduce health inequities. This chapter will conclude with limitations to consider for future studies and an overall summary of this action-oriented research study.

## **1.2 Defining Chronic Stress and Stressors**

This study primarily focuses upon the chronic stress experienced by neighbourhood members in relation to the neighbourhood they live or work in. For this study's purpose, stress is defined using Baum's (1990) definition as a negative emotional state and experience in response to threats, harms, or demands. This stress response occurs to adapt to these threats, harms, or demands for the purposes of coping. Stress cannot be described without stressors, which are defined as "events or thoughts that can cause harm or pose threats or challenges" (Baum, 1990, p. 660).

Further, stress and stressors are classified as chronic when they persist for extensive periods of time (Baum, 1990). This does not suggest that a chronic stressor necessarily leads to the experience of chronic stress. Both acute and chronic stressors can result in chronic stress (Baum, 1990). For example, gun violence occurring in a community over a series of months that an individual perceives to be threatening their safety is classified as a chronic emotional stressor. Even if a stressor is removed or no longer exists, it can still cause a response of chronic stress (e.g., war veterans and persistent terror) (Baum, 1990).

This study specifically focuses on chronic place-based stress and chronic environmental stressors and resources. As discussed by Shankardass (2012), place-based stress suggests that stress is experienced as a result of an individual's environmental surroundings, their perception of these surroundings, and their socioeconomic position. For example, an individual may experience place-based stress from experiencing continuously lengthy and busy public transit commutes to work each morning and without the resources to obtain a vehicle. However, an individual with the ability to use other means of transport, such as carpooling with family members may not experience stress as a commuter. Whereas environmental stressors are related to location-specific stressors (e.g., overcrowded subway trains), environmental resources are those that can buffer or intercept the adverse physiological and emotional effects of place-based stress (e.g., having a city councillor advocating for changes to transit) (Shankardass, 2012).

The impact of various stressors and the manifestation of related outcomes (i.e., social, physiological, emotional, behavioural, spiritual) varies depending on individual

differences and coping behaviours (Baum, 1990). First, these individual differences could be genetic vulnerabilities that can heighten the risk of illness, such as stressful events worsening the effects of rheumatoid arthritis, a disorder that can be genetic (Salleh, 2008). Some personality traits, such as optimism may buffer the effects of stressful events as well (Anisman, 2015). Age and sex can also be factors in the impact of stress, such as younger and older individuals who are more susceptible to illnesses and women and men who generally face different challenges in the world (Anisman, 2015). In addition, having an available support system can moderate the impact of stress as well (Cobb, 1976; Lin, Ensel, Simeone, & Kuo, 1979), as exemplified through a study finding that having social support can act as a buffer for the effects of stress on patients with acute coronary syndrome (Wiesmaierova et al., 2018).

Second, how individuals cope with experienced stress can result in improvements or reductions to their overall health (Shankardass, 2012), such that healthy behaviours (e.g., physical activity) and risky behaviours (e.g., smoking cigarettes) can result in different health outcomes. The lack of environmental resources to pursue healthy coping behaviors can also affect stress related outcomes (Shankardass, 2012), such as a lack of affordable fitness centers for physical exercise. These different traits and vulnerabilities can lead to a heightened risk for disease following extensive periods of suppressing the immune system (Cohen et al., 2012; Salleh, 2008). As such, place-based related stress can be considered through the overlapping pathways of physical manifestation of illness and coping styles (Shankardass, 2012), especially where individuals perceive a lack of control over stressful events (Salleh, 2008). Understandably, this can be challenging to conceptually understand

how place-based stress occurs without context, thus stress within neighbourhood environments will be explored next.

### **1.3 Understanding Stress Within Context**

Prior to discussing the structural framework, we will first clarify the differences between communities and neighbourhoods. As highlighted by Diez Roux (2001) neighbourhood and community are often used interchangeably, and differences are not precisely defined. Neighbourhoods may refer to areas historically defined, dependent on the neighbourhood users' characteristics, administratively defined, or dependent on the perceptions of others (Diez Roux, 2001). In comparison, a community may be defined by "a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings" (MacQueen et al., 2001, p. 1936). Both groups take place in geographical areas but can vary in size dependent on the purpose of the study. In the following discussion, a neighbourhood refers to a geographic area that is administratively defined and a community refers to a geographic area that is bound based on others' perceptions. As such, communities may or may not exist within multiple neighbourhoods but are distinct from neighbourhoods.

Researchers studying neighbourhood environments and its ability to shape the health of its neighbourhood users have increased substantially since the early 90s (Bernard et al., 2007; Diez Roux, 2001). There is substantial evidence found of neighbourhoods and their links to health outcomes independent of individual factors, such that characteristics of where individuals live, play, and work can increase the rate of risky coping behaviors, such

as smoking behaviour (Duncan, Jones, & Moon, 1999) and negative health outcomes, such as heightened mortality risk (Yen & Kaplan, 1999).

For example, the five neighbourhood determinants of health described by Macintyre, Ellaway, and Cummins (2002) can be used to consider how healthy a neighbourhood is. Macintyre et al. (2002) suggested the physical features of the neighbourhood that are used or shared by all neighbourhood users, such as drinking water or weather conditions can impact health. The availability of a healthy neighbourhood for living, working, and playing is another determinant can have varied effects for different neighbourhood users. For example, having safe playgrounds will more likely affect families with children who live in the neighbourhood in comparison to those who only work in the neighbourhood. Similarly, the availability of public or private support services was described as a determinant that can affect neighbourhood users differently. Support services can be public transit, walk-in clinics, and community centres, which some neighbourhood users may rely on more than others. The reputation of the neighbourhood can also affect how its users, urban planners, service providers, and investors perceive, allocate resources or utilize the area. Lastly, the socio-cultural features of a neighbourhood can also affect the health of neighbourhood users. For example, criminal activity, community integration, and the availability of support networks can affect neighbourhood users' sense of safety.

This research, particularly the socio-cultural features, is related to the concept of neighbourhood disorder, which is defined as “the perceived lack of control and social order in the community (Skogan, 1990)” (Ross & Jang, 2000, p.402). Having control preserves



social order, in which a neighbourhood is characterized as peaceful, safe, and one where others are complying with the law (Ross & Jang, 2000). Neighbourhood disorder is exemplified through two ways, physical and social disorder (Skogan, 1986, 1990; Skogan & Maxfield, 1981; Taylor & Hale, 1986; Taylor & Shumaker, 1990 as cited in Ross & Jang, 2000; Ross & Mirowsky, 2001). Physical disorder refers to the disorder of the physical environment, whereas social disorder refers to disorder caused by the individuals' behaviour within the environment (Ross & Jang, 2000; Ross & Mirowsky, 2001). An example of physical disorder and social disorder may be a neighbourhood littered with garbage and individuals driving recklessly in a neighbourhood, respectively. Behaviours of social disorders are not always illegal, but do contribute to a sign of disorder in the neighbourhood (Ross & Jang, 2000). For example, individuals loitering in public spaces may not be illegal, but could pose as a safety concern for residents.

These signs of neighbourhood disorder can also be characterized as environmental stressors, as described earlier, as they are related to the neighbourhood and can cause harm or be perceived as threatening for individuals. Previous research has suggested that neighbourhoods experiencing disorder can affect residents' level of fear of crime and mistrust of neighbours (Ross & Jang, 2000). This mistrust is associated with perceived social cohesion, which is defined as "an individual's reported sense of trust, shared norms, and connectedness within her or his community" (Bjornstrom & Ralston, 2014, p. 721). Further, living in neighbourhoods that are disadvantaged through neighbourhood disorder was found to be negatively correlated with the health status of residents, theorized to be a result of experiencing psychosocial stress from fear (Ross & Mirowsky, 2001).

The impact of neighbourhood disorder has been studied for individuals' stress. Children aged between four and 12 living in disordered neighbourhoods were found to have lower levels of serum cortisol (Dulin-keita et al., 2016), a hormone used for the hypothalamic-pituitary-adrenal (HPA) axis to adapt to stressful events (Anisman, 2015). This study's finding supports the theory that low neighbourhood socioeconomic status, including characteristics of high unemployment, low-income, sole female-headed parent households with dependent children, and high vacant housing suggesting neighbourhood disorder can impact health through cortisol levels (Dulin-keita et al., 2016).

A study conducted by Warr, Tacticos, Kelaher, and Klein (2007), found that residents within low-income neighbourhoods perceived four main categories of factors that impact health. This includes macro-level structural issues (e.g., poverty), place-based issues (e.g., poorly maintained public spaces), substance use behaviour (e.g., alcohol abuse), and reactive and psychological responses to neighbourhood stressors (e.g., depression). Whereas residents of high-rise buildings prioritized place-based issues, residents of broad spatial areas were focused on several of the aforementioned categories, such that macro-level structural issues were associated with place-based issues, and reactive and psychological responses. As this study's sample consisted of many migrated individuals, other documented challenges were experiences of racism, communication barriers, and isolation from the network in their home country. This study has implications for future interventions for disordered neighbourhoods with a high concentration of high-rise buildings and immigrant populations.

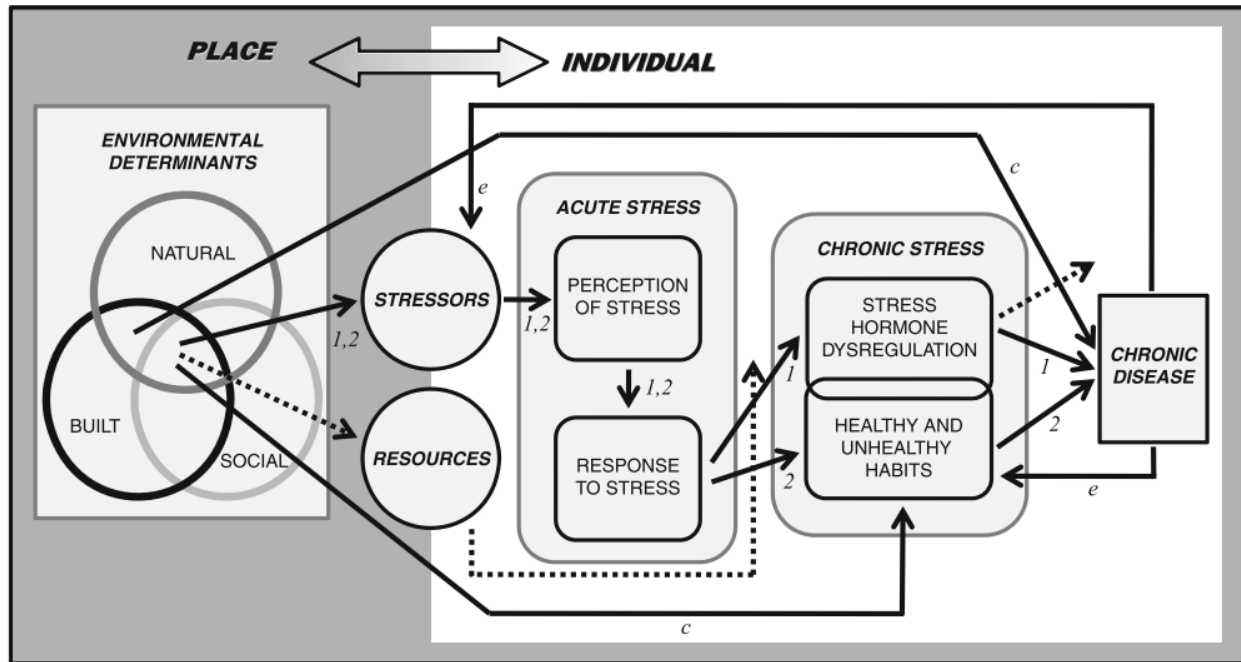
However, as Shankardass and Dunn (2012) suggested, studying neighbourhood characteristics and their links to health outcomes has often resulted in shallow understandings as neighbourhood users can face “multiple social mechanisms of causation” that may be specific to their context and not generalizable to other neighbourhoods (p.141). Thus, the contextual factors or the fundamental causes of these risk factors need to be considered by researchers for different neighbourhoods.

Using Shankardass and Dunn's (2012) example of fundamental causes and social mechanisms of neighbourhood disparities, an individual's health outcome can be impacted within three overarching levels. At the macrosocial level, factors such as availability of social welfare programming and national health insurance programs can influence the characteristics of neighbourhoods. At the neighbourhood level are fundamental causes that are pathways to the social mechanisms of causation that users are exposed to, such as high rates of crimes resulting in exposure to street violence. In turn, at the household and individual level, this results in health outcomes reflective of the encompassing factors, including chronic stress. There is a clear need to understand the complexity of factors behind the scenes of neighbourhoods and health outcomes so we will review a conceptual framework that considers these components.

#### **1.4 Using a Systems View of Environmental Determinants to Understand Place-Based Stress and Chronic Disease**

Shankardass's (2012) conceptual framework as seen in Figure 1.1 describes the two potential pathways that environmental determinants can lead to chronic disease, which

greatly informs new research considering how to tackle the complexity of factors behind place-based stress and chronic disease.



Reprinted by permission from RightsLink: Springer Nature *Place-Based Stress and Chronic Disease: A Systems View of Environmental Determinants* by K. Shankardass. Copyright 2012.

Figure 1.1. “Place-based stress and chronic disease: a systems view of environmental determinants.

*Solid arrows* indicate the pathways that relate environmental determinants of stress to chronic diseases via primarily physiologic changes in response to stress hormone dysregulation (1) and in relation to healthy and unhealthy habits related to coping (2), pathways of endogeneity (e), and pathways of confounding (c), while *dashed arrows* that cross *solid arrows* indicate effect modification” (Shankardass, 2012, p. 125).

The framework outlines the three typical environmental determinants that may influence stress and coping, including natural (naturally occurring), built (for human activity) and social (sociocultural factors) determinants (Shankardass, 2012). These environmental determinants can influence the rate of stressors experienced, the use of resources to cope with stress and the development of healthy and risky habits, which can in turn lead to chronic stress and the outcome of chronic disease. However, chronic disease can also lead to an increased number of stressors experienced and influence chronic disease in a cyclical way, which highlights the complexity of stress, it does not always occur in a linear pattern. The need to consider the factors accompanying the socioeconomic status of individuals, the accessibility of environmental and personal resources, and how individuals can shape their environments and influence stressors and resources are all critical in studying place-based stress.

This conceptual framework can inform researchers to think holistically about the multiple compounding and conflicting relationships between environments and chronic diseases. As individuals can also take part in shaping their environments, they should be engaged to be informed of the stressors they are experiencing and how these stressors can affect their health to reduce these stressors and their impact (Shankardass, 2012).

This refocusing from individual behaviours to the greater social context is echoed in WHO Commission on Social Determinants of Health (CSDH)'s conceptual framework (Solar & Irwin, 2010). This framework suggests similarly that there is an integral need to understanding the structural determinants of health inequities, which encompass the greater socioeconomic and political context that neighbourhoods are living in and the

socioeconomic position of individuals. These structural determinants can lead to increased health risks as a result of material circumstances, behaviours and biological factors, and psychosocial factors (Solar & Irwin, 2010).

Previous studies have identified that income inequality is significantly related to numerous negative health outcomes. Income inequality was found to be positively correlated with rates of obesity, mortality due to diabetes, and average calorie intake amongst men and women in 21 developed countries, including Canada and the United States (Pickett, Kelly, Brunner, Lobstein, & Wilkinson, 2005). Income inequality also significantly contributed to inequalities in cardiovascular disease across a longitudinal sample of individuals aged between 40 and 60 years between 1990 and 2010 (Mosquera et al., 2016). A cross-sectional study identified that between 2006 and 2014, income inequality was positively correlated to heavy alcohol consumption, obesity, and diabetes, while negatively correlated to exercising, physical health problems, and mental health problems in the past month (Bjornstrom & Ralston, 2014).

Poor oral health is another example of the impacts of income inequality. Farmer, McLeod, Siddiqi, Ravaghi, and Quiñonez (2016) found consistent results that income-related inequalities, particularly income and education levels impacted oral health in Canada and United States. Individuals that did not attain high school education or had low income were more likely to experience untreated dental disease. As explained by Goma, Glogauer, Tenenbaum, Siddiqi, and Quiñonez (2016) in a systematic review, interdependent relationships exist between the variables that lead to oral health inequalities, including one's socioeconomic position (e.g., income and education levels),

health compromising behaviours (e.g., smoking), psychosocial stress (e.g., financial stress), and pathophysiological process (e.g., allostatic load). Both social and psychosocial experiences can affect individuals' biological systems together, resulting in chronic disease.

Research focusing on a macro level of health inequities is needed by larger international governmental organizations and agencies that can play influential roles in strategic planning for changes in health inequities. Research on interventions to reduce place-based stress within communities and neighbourhoods can be shared with urban planners and government bodies to create transformative change in health inequities, caused by environmental determinants.

### **1.5 Defining Resilience**

Within the academic literature, the discussion of individuals experiencing stressors also often highlights resilience, defined as the capacity to “maintain relatively stable, healthy levels of psychological and physical functioning” in the face of stressful events (Bonanno, 2004, p. 20). As resilience and recovery are often discussed together, it should first be clarified that resilience and recovery are distinct processes. Whereas resilience is focused on responding and coping with adverse events or experiences (Harper & Speed, 2012) - but not in a way that impacts functioning dramatically (Bonanno, Galea, Bucciarelli, & Vlahov, 2007) - recovery is focused on the process of returning to normal functioning (i.e., prior to the experienced adversity) (Bonanno, 2004). As discussed by Anthony (1993), recovery is a term used within the history of mental health work and used to describe “a deeply personal, unique process of changing one’s attitudes, values, feelings, goals, skills,

and/or roles” (p. 15). Thus, not only focusing on the mental illness itself, but moving beyond the changes that accompany mental illness.

However, it is also argued by Harper and Speed (2012) that the focus on recovery is limiting, such that it highlights an individualized process and polarized concept, and so being resilient entails an absence of weaknesses and not being resilient entails an absence of strengths. They also called upon a need for a collective approach to recovery to frame resilience not just as a personal matter but also to situate these individual narratives in a collective way to consider what assets and resources at the structural level can aid in recovery from adversity. This illuminates the value of using a community engagement approach to understanding community resilience.

Not unlike Harper and Speed's (2012) definition of resilience, Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum (2008) frame community resilience as “a process linking a set of networked adaptive capacities to a positive trajectory of functioning and adaptation in constituent populations after a disturbance” (p. 131). It views community resilience as a process as opposed to an outcome, the sooner one can return to functioning, the more resilience one has. The process follows that by using available resources that are considered valuable, one can overcome a stressor and adapt to the altered environment. If there are not suitable resources to be mobilized, then one may not adapt to their environment and continue to be vulnerable to these stressors. The end outcome is not resilience, rather adaptation to the stressors. Having community resilience leads to the use of capacities to reach adaptation and to attain population wellness, which Norris et al.



(2008) defined as “high and non-disparate levels of mental and behavioral health, role functioning, and quality of life in constituent populations” (p. 133).

As neighbourhood-level protective and risk factors can increase one’s resilience, such as social cohesion and social control (Jaffee, Caspi, Moffitt, Polo-Tomás, & Taylor, 2007), we propose to also consider a community level approach that can help consider stress and resilience in a broader context. The focus on community resilience helps consider not only how agency and individual factors can come into play but also structural contextual factors that can bear responsibility to the chronic stress and resilience a community face.

To explain further, community is framed by Norris et al. (2008) as across levels so not only are communities being defined by groups that reside in the same geographic boundaries but also those that share the same goal or history. Community capacities captures how resources are mobilized and the attributes of these resources, including robustness, redundancy, and rapid accessibility. Norris et al. (2012) described robustness as strength, redundancy as the ability to buffer a variety of stressors, and rapid accessibility as the ability to be used in rapid time. These capacities are further described in four categories, including information and communication, community competence, social capital, and economic development. This holistic view of community capacities provides an opportunity to explore interventions focused on empowering community capacities to build resilience that can help adapt to stressful events. As such, we will review how a model of empowerment can inform these interventions prior to evidence-based interventions of stress, community resilience, and empowerment.

## **1.6 Empowerment Definition and Model**

Prior to reviewing a model of empowerment, we will first define what empowerment entails for this study. Page and Czuba's (1999) definition of empowerment will be used for this study, in which empowerment is “a multi-dimensional social process that helps people gain control over their own lives” (para. 11). As Page and Czuba (1999) discussed, empowerment is multidimensional as it can be considered through psychological, sociological, economic, and other dimensions. Empowerment can also occur at the individual or group level, such as community or neighbourhood settings. Further, it is defined as a social process, in which empowerment occurs through relationships and is also a process through which individuals and communities develop and build empowerment.

Building on the aforementioned definition of empowerment is Fawcett et al.'s (1995) model of empowerment designed for collaborative partnerships between community members and the support team, and focused on improving community health and development. Like Page and Czuba's (1999) definition of empowerment, this model of empowerment is used as a process throughout the partnership. The model begins with collaborative planning where individuals with a diverse range of backgrounds (e.g., those directly involved and those with research expertise) are involved to plan change. The community participants determine goals and outcomes of the intervention or study. Community leaders and the support team enable collaborative planning by enhancing experiences and competencies involved (e.g., identifying community issues to address and listing community assets).

In the next stage, Fawcett et al. (1995) outlined community action and change, as those involved take action through planning. Following, community capacity and outcomes are achieved as a result and with consideration of potential negative impacts, such as contextual factors (e.g., local regulations preventing change). Fawcett et al. (1995) suggested supports from local institutions with power are greatly appreciated in this regard (e.g., neighbourhood associations). Lastly, collaborative empowerment is fostered through a community's capacity to adapt, renew, and establish themselves as sustainable organizations despite new challenges.

Empowerment appears to play a key role in or constitutes as an outcome observed in resilience interventions. As described by Béné, Frankenberger, and Nelson (2015), resilience interventions typically focus on reducing the need for communities to turn to responses that could lead to undesirable outcomes while also improving their capacity to respond to stress adaptively. Béné et al. (2015) further clarified that resilience interventions seeking to improve resilience are not seeking to promote or prevent positive or negative coping strategies, rather to strengthen the capacities of individuals to select the coping strategy that is appropriate for them in the face of stressors. As such, we will explore the effectiveness of past interventions that have focused on building resilience to respond to stress. We will also consider how empowerment may have played a role in these interventions.

### **1.7 Evidence-Based Studies for Improving Stress and Resilience**

Community empowerment and community resilience were effects observed from the short-term intervention focused on reducing violence within low income areas of

Honduras of Central America through community engagement (Hansen-Nord, Kjaerulf, Almendarez, Rodas, & Castro, 2016). The three-year intervention consisted of rebuilding social capital, defined as “the ability of actors to secure benefits by virtue of membership in social networks or other social structures” (Portes, 1998, p. 6). This rebuilding was done through empowering community members to participate in collective activities aimed to reduce violence. This includes recreational activities to focus on creating a culture of peace with the leisure time of young adolescence. The intervention measured a reduced level of violence of 42% compared to the baseline. An increase in social capital was also measured, in which one of the impacts noted was an increase in participation of citizenship activities.

Empowerment was also facilitated through community visioning to build community resilience amongst communities in coastal locations vulnerable to climate change (T. F. Smith et al., 2011). The intervention was focused on building resilience through four stages. The first stage was community visioning, in which a series of workshops were implemented that involved multiple perspectives (e.g., residents, urban planners, entrepreneurs) to envision a shared future that all would agree upon based on values and priorities. The second stage was conducting an institutional analysis to assess the opportunities and barriers to adapt to climate change, the impacts of adaptation, and recommendations to enhance capacities of communities. The third stage was an evaluation to assess the progress, barriers, opportunities, and successes of adaptation, as well as additional recommendations to enhance capacities of communities. The fourth stage was to share these findings, methods and application, and evaluations with stakeholder groups and national advisory groups to continue improving resilience of other communities facing

climate change. As such, this intervention, which ultimately led to the development of a community action plan, was able to engage communities and decision makers of sea change communities to respond to climate change through the shared community knowledge.

A third resilience intervention to discuss was aimed towards empowering bombing victims in Indonesia using law enforcement support (Sukabdi, 2016). Five stages were involved in this intervention to transform bombing victims into champions. The first and second stage were physical rehabilitation and psychosocial rehabilitation, which focused on the victims physically and psychologically recovering from the trauma of the violence. The third stage was harmonization using group therapies and dialogues to collectively heal through the trauma. The fourth stage was participating in empowerment programs to explore the potential ways bombing victims can be active agents of change to reducing violence. The last stage was to generate these change agents who are capable of creating change to prevent future acts of violence, such as by taking on roles of public speakers to campaign for anti-violence. This intervention was also focused on the collective efforts of its participants, police officers, medical professionals, victim protection agency, and societal members to work towards transforming and empowering bombing victims.

The aforementioned studies suggest that community-based interventions that have empowered community members will have sustainable impacts on their social environments. Having ongoing impacts of these interventions is further in acknowledgment that community resilience and empowerment are ongoing processes and not simply outcomes to be achieved.

Pfefferbaum, Pfefferbaum, and Horn (2015) reviewed six resilience interventions and suggested six key principles. First, resilience interventions take a multihazard approach by looking at threats in an ecological system, not only considering local threats but also considering macro contextual stressors. Additionally, they utilize a community assessment, so they are not only considering the vulnerabilities to stressors but also highlighting their strengths. This requires engagement of the community and specifically, participants of the intervention that represent the community in discussion. Working with communities already vulnerable to threats or disasters entails prioritizing bioethical principles to reduce risks and unethical practices. Lastly, targeting assets and needs, and fostering skill development in resilience interventions builds resilience as a process and reduces the risks of adverse outcomes.

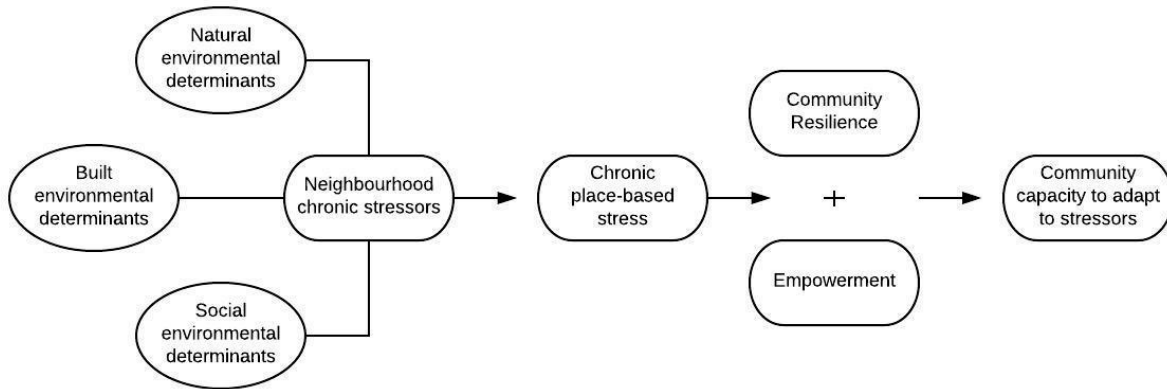
In addition to the above principles, Ungar (2011) suggested a need to evaluate a community prior to collaborating to consider what resources the community needs. First, they need to look at what individual attributes make up the group as well as their surrounding context that may impact the social determinants of health. It is also necessary to look at how well the community can navigate and negotiate necessary resources to adapt to adverse situations. Finally, as we collaborate with communities, it is important to be aware of varying cultural contexts that shape the resources they value and need to overcome disasters or stressors. Following these community assessments, Ungar (2011) also recognized that the design of interventions must take a coordinated approach by involving an interdisciplinary team, be sustained overtime as challenges arise, and be easily

located for accessibility needs. Community stakeholders, evidence-based services, and cultural values must be involved to inform the decision-making for the design.

However, stress and resilience interventions have focused on communities and neighbourhoods that are identifiable by traumatic events (e.g., terrorist events) or potential disasters. There are less evidence-based studies of interventions found that target chronic stress and low resilience within areas of less pronounced drastic events or effects. For example, some neighbourhoods may be chronically stressed due to issues of neglect and abuse of the political system and governance but are not as easily identifiable by significant events or disasters. In addition, there is a lack of evidence suggesting effective methods to identify “problematic” neighbourhoods that can take levels of chronic stress overtime into consideration. Thus, there is an apparent need to consider how to identify those neighbourhoods to understand the different environmental determinants affecting levels of chronic stress and resilience. Next, we consider a collective framework to understand how chronic stress, empowerment, and community resilience work in this study.

### **1.8 Collective Framework of Stress, Empowerment, and Resilience**

As elements of this thesis have been discussed, a collective framework to understand how these elements are involved in this study is shared in Figure 1.2.



*Figure 1.2.* Collective framework of chronic stressors, empowerment, and community resilience.

As discussed previously, the natural, built, and social environmental determinants can contribute to the number of chronic stressors experienced that can lead to chronic stress in one pathway (Shankardass, 2012). However, community resilience and empowerment can act as processes that can improve a community’s capacity to adapt to stressors and as a result, reduce the negative health outcomes associated with chronic stress. Thus, community resilience and empowerment are not outcomes to be achieved but processes that can enable community members to have the capacity to choose the strategies appropriate for their challenge and context.

Next, we introduce a background of how social media, as a form of big data can be used to identify high chronic stress neighbourhoods.

### **1.9 Understanding the Potential of Big Data**

Social media, Web 2.0 Internet-based applications that are fuelled by user-generated content (Obar & Wildman, 2015) are the major guiding pieces of this thesis to identifying



neighbourhoods. The data produced from social media usage are now one of the most popular forms and examples of big data (Rajaraman, 2016). Big data generally refers to a massive volume of data that is attained from a variety of sources at a high speed (Sagiroglu & Sinanc, 2013). Datasets are classified as big data when they cannot be efficiently processed on typical software due to their enormous size (Manovich, 2011).

According to Zinjurde, Magare, and Parwe (2013), big data's characteristics can be understood through six Vs, revealing its intriguing characteristics but also complexities. These datasets are characterized by their volume, velocity, variety, veracity, variability, and value. For clarity, Twitter is considered here as an example. If one gathered the collective Tweets of an urban city, it imaginably generates a massive volume of data and if using the appropriate software, it can be collected at a high velocity rate while encompassing varied data. The value of a single Tweet may be insignificant when examined individually but used in sum from various Twitter users (variability), it can reveal interesting findings about a location and its users. For example, the analysis of Tweets can suggest particularly negative emotions associated with a geographic location. However, as we gather Tweets from several users, any conclusions drawn requires careful consideration of its credibility and reliability (veracity). For example, how may anonymous content posted on Twitter affect how credible or reliable the results are? The literature also cautions against implicitly relying upon the results obtained from big data, such that the data collected likely does not represent all potential sources of data (Rajaraman, 2016). However, analysts of these datasets (e.g., Twitter Tweets) can draw out meaningful insights to make the use of big data worthwhile (Rajaraman, 2016; Sagiroglu & Sinanc, 2013).

According to Andreu-Perez, Poon, Merrifield, Wong, and Yang (2015), the rate of publications citing big data has increased dramatically between 2008 and 2015, and the field of healthcare also follows this upward trend. Specifically, big data has been used in domains of bioinformatics, health informatics, and sensing and imaging as a result of the unique opportunity in combining traditional health data with mobile health, such as smartphone health app activity, and social health, such as social networking. For example, in using smartphone health apps, valuable health information can be stored for developing personalized interventions for non-communicable diseases (Atun et al., 2013). Andreu-Perez et al. (2015) concluded that big data's impacts on healthcare can be used to predict the applicability of research to the general population, prevent the outbreak of diseases, develop personalized healthcare, and more. Thus, the usage of big data in the context of health care can lead to changes in treatments for acute and chronic diseases.

The usage of big data can also change the way citizens consider their own health and well-being by allowing citizens to understand the causes and adverse outcomes of diseases, and how to predict and prevent these diseases (Khoury & Ioannidis, 2014). Big data's inclusion has since been considered inevitable to the field of health care for its many capacities to advance, disseminate, and transform knowledge (Murdoch & Detsky, 2013).

However, the usage of big data is particularly novel in the field of community psychology and in action-oriented research. Despite the many opportunities discussed regarding collecting and analyzing big data for the improvement of health across the literature, there is a lack of research surrounding how big data can be used within communities. Perhaps this is because the usage of big data is often considered solely for the

work of academic researchers, government bodies, and business leaders (H. Chen, Chiang, & Storey, 2018). For example, this type of work can include making scientific impact, improving public safety, and increasing customer satisfaction, which may be in the interest of the public; yet the application of big data has not provided the opportunity for communities to take big data and make big impact themselves.

This area is explored in a unique way by Gerbaudo (2012), who considered social media, specifically the platform, Twitter, as a medium for collective groups to organize their social movement and mobilize their power. As Gerbaudo (2012) explained, using Twitter, a platform based on the exchange of big data (i.e., Tweets) that can reveal geographic and temporal information about a user, can reveal the power of online media to bring groups from different spaces together for collective action, such as protests. This usage of Tweets may not be considered as a usage of big data because it does not imply any need for analysis or complex software to mobilize but it does illustrate the possibility of communities taking big data to make collective impact.

We will next discuss how big data can be analysed to map the emotions of its users and the impacts of previous studies that have done so.

### **1.10 Big Data and Emotion Mapping**

Big data empowers big cities through three areas: (1) policies and regulations, (2) public services, and (3) future activity (Glaeser, Kominers, Luca, & Naik, 2018). By triangulating data through multiple sources, including activity from a variety of websites, big data can provide a more comprehensive view of how policies and regulations affect changes in urban cities. The resources and efforts of a city can also be used accordingly

when big data can be used to predict areas of a city that need public services. Lastly, gathering Smartphone application data can forecast future economic activity, such as spending and consumption patterns to inform urban planners and policymakers. Emotion mapping, a form of big data collection, visualisation and analysis is a unique way of coupling urban city users' emotions into these three areas. Through emotional clusters, which represent areas in which participants have a higher tendency to report their feelings (De Oliveira & Painho, 2015), we can visualise a map of emotions that are likely linked to a geographical spot. This allows us to identify emotional patterns to predict feelings about these geographical areas overtime (De Oliveira & Painho, 2015).

It has been discussed that emotion mapping can provide current information and predictions in several different domains, such as mental health, because with the appropriate tools it can reveal insights that surveys, interviews, and other qualitative methods can not (Larsen et al., 2015). For example, one of emotion mapping's most useful and unique traits is the ability to present real-time insight into our emotions whereas surveys and interviews can only suggest results from points in time. Emotion mapping has also resulted from several different tools that extract emotions from participants' activities and tie this to other inferences. For example, Nold's (2018) Bio Mapping project enlisted participants to hold his created tool to record emotional arousals while traveling through the city. Following this, participants would return to the researcher and explain their emotions in respect to the environment they were travelling through to provide insight on the collected data of their emotional arousals. In comparison Larsen et al.'s (2015) We Feel system analyzes the relationships between emotion, geographic location and gender

through Twitter Tweets to better understand the demands and needs of mental health.

EMOTIVE (Extracting Fine-Grained Emotions from Terse, Informal Messages), the tool for Phase 1 of this study, is a similar tool.

EMOTIVE is used to identify the emotion of chronic stress. Most simply, EMOTIVE extracts emotions from social media expressions to interpret and predict relationships to their geographic location (Sykora, Jackson, O'Brien, & Elayan, 2013). There are two qualities of the tool that allow it to uniquely extract fine-grained emotions from social media expressions that are geo-tagged. First, instead of analyzing words and phrases for limiting polarizing emotions (e.g., positive and negative), EMOTIVE matches words and phrases to a wide range based on eight basic emotions, outlined by social psychologist, Dr. Ekman (Ekman & Richard, 1994, as cited in Sykora et al., 2013). These emotions include anger, confusion, disgust, fear, happiness, sadness, shame, and surprise and has since expanded into a subset of emotions. The tool also considers the strength of emotions to understand the intensity of the emotions. For example, the emotion of fear can fall between feeling uneasy and feeling petrified.

Second, EMOTIVE takes a different approach by customizing the typical natural language processing (NLP) pipeline that essentially helps break down words and phrases to more effectively match text to emotion because social media expressions like Tweets often contain slang, misspellings, and hashtags in text (Sykora, Jackson, O'Brien, Elayan, & Von Lunen, 2014). Emotions are then mapped in real-time and in consideration of spatiotemporal differences in Tweets to suggest patterns in emotions (Sykora et al., 2013). These highlighted characteristics, including the analysis of two levels, range and intensity,

and customized NLP pipeline allow researchers to use EMOTIVE for macro-level research, including understanding city-wide public reactions to events.

To highlight a few cases, some studies recently used EMOTIVE to understand and predict mental health outcomes in response to significantly impactful events, such as the Paris terrorist attacks (Gruebner et al., 2016) and Hurricane Sandy (Gruebner et al., 2017). It has also been previously used to identify mental health conditions among Tweeters in the UK (X. Chen, Sykora, Jackson, Elayan, & Munir, 2018), which can help clarify what sorts of resources should be allocated geographically. Further, EMOTIVE can also identify the personal activity centers (PACs), the homes and work settings of Twitter users based on their activity over space and time (Robertson, Feick, Sykora, Shankardass, & Shaughnessy, 2017). Pairing participants' PACs with emotion analysis may result in more effective public health planning and evaluation in the future, by considering how individuals interact in spaces that experience high pollution, crime rates, or other issues (Robertson et al., 2017). For example, urban planners may consider if some areas require more resources to alleviate the impacts of these issues during neighbourhood level planning.

These studies support EMOTIVE as a novel tool to explore potential causal relationships between environments and emotions (e.g., how Paris terrorist attacks result in emotional consequences specific to areas of the attack) (Gruebner et al., 2016). These studies also collectively show us that without the participation of Twitter users, the tool would be ineffective, reminding us of the close connections between emotion, technology and environment (Nold, 2018).

### **1.11 How Different Communities Use Social Media**

In using EMOTIVE to identify Toronto communities to engage and strategize with, it is anticipated the social media users that published the geo-tagged Twitter Tweets are representative of the Toronto users who use Twitter. However, with a lack of research studies examining the population of the Twitter community in Toronto, Ontario, or Canada, other comparable countries were considered for the purposes of this literature review.

A recent Social Media Fact Sheet published by Pew Research Center (2018), noted as of January 2018, young adults in U.S. continue to account for the largest group of social media users with 88% of young American adults between the ages of 18 and 29 having used at least one social media site. The second highest age group accounted for 78% of ages between 30 and 49, followed by 64% of those between the ages of 50 and 64 and lastly, 34% of those aged 65 and above. Though the assumption that older adults are not represented as widely on the social media sphere is true, in 2018 there was an increased representation of all age groups above 18 compared to previous years in the U.S.

This suggests the research analysis of Tweets will continue to have a high representation of young Tweeters but also have a greater representation of other age groups, like those aged 65 and older. However, these statistics do not account for a diverse range of race (e.g., only focused on Hispanic, White and Black) and gender (e.g., only focused on women and men) making it difficult to infer how represented these groups are on social networking sites.

A study done on the demographics of Twitter in the U.S. by Murthy, Gross, and Pensavalle (2016) suggested teenagers and college students are Tweeting the most despite

the age groups of 20s and 30s dominating the number of Twitter profiles. Similarly, despite men accounting for a greater number of Twitter profiles, women are Tweeting the most often. Black users were found as overrepresenting the Twitter sphere and especially in cities with a higher population of Black residents even with White users accounting for a greater number of profiles. When age, race, and gender were intersected, young Black users in urban locations Tweeted at significantly greater rates. This study suggested intersections of age, race, and gender can offer insights that should not be ignored and concluded geographic location of users is correlated significantly with Twitter users. This helps future studies predict relationships between urban or rural areas and frequency of Twitter use.

EMOTIVE relies on geo-tagged Tweets, which means that only the Tweets of Twitter users with public profiles, location services enabled, and Tweets geo-tagged are collected and analyzed. In a study by Sloan and Morgan (2015), 59% of worldwide users do not have location services enabled, while 42% of users do. However, only 3% of users actually have Tweets geotagged to a specific location; although this is expected to vary by setting given privacy and data usage implications. Users with unisex names compared to identified men and women were less likely to geotag their Tweets. Younger age groups compared to their mid-twenties and above counterparts are more likely to enable location services, wherein the average age of users who geotag their Tweets is 21.58. Cultural differences were also found, wherein Turkish users were most likely to geotag Tweets compared to Korean users, suggesting possible preferences in privacy settings. Sloan and Morgan's (2015)



findings suggest it is critical to consider the low representation of the wider Twitter population and as expected, the rest of the population.

As a result of an expected low rate of geotagged Tweets, this thesis study took further measures by triangulating the Tweet analysis with other methods, including publicly accessible social, economic, and health data at a neighbourhood level and a community engagement strategy. We anticipate this mix of quantitative and qualitative data can help us begin to understand how Tweet analysis is or is not a useful tool for predictions of chronic stress and resilience.

In the next two sections, we will discuss how a CAB and the use of concept mapping can be used for community engagement and planning.

### **1.12 Community Advisory Board (CAB)**

With the predetermined focus on chronic stress and community resilience and pre-development of the study's first phase of emotion analysis, the implementation of a CAB to represent the community participants' interests is considered here. As discussed by Strauss et al. (2001), the establishment of a CAB can provide instrumental support to the study's researchers by ensuring the study's benefits outweigh the foreseeable risks for participants. As such, a CAB may provide alternative suggestions for the guiding research objectives and proposed methods of the study as a result of their expertise and experience in the community. This active engagement of the community to provide consultation can redefine research participants from victims to partners (L. W. Green & Mercer, 2001) and set community-based research apart from traditional methods by valuing their expertise.

In a review of a 22-year-old CAB that consulted on a study focused on HIV within the community of gay men, it was found the benefits of a CAB can be numerous when implemented and supported appropriately for both researchers and participants (Silvestre, Quinn, & Rinaldo, 2010). This CAB regularly consulted on the study's design to identify potential barriers for participant recruitment and reduce the burden caused by their participation. The CAB also used their insights to propose additional research questions that could be answered, enhancing the study overall. CABs can evidently play a significant role in enhancing research and strengthening the partnerships between researchers and communities, especially vulnerable sectors.

However, the literature does present some challenges to anticipate in establishing CABs for a research study. Some may argue that using a CAB may shift the autonomy from individuals to community leaders, which may not always be desired by research participants (Strauss et al., 2001). For example, it may be a concern if the established CAB does not encompass a diverse range of views from the community. This suggests that careful consideration is required in establishing a CAB, ensuring that the judgement of willing participants is trusted by local community members.

Another challenge presented by Shubis, Juma, Sharifu, Burgess, and Abdulla (2009) was ensuring adequate training was provided, especially when working with members of a low-income and low-resource community. To bridge the educational and linguistic divide experienced in Shubis et al.'s (2009) study, it required time to be spent communicating relevant concepts and phrases unfamiliar to the community but necessary for the study. These researchers also suggested that absolute clarity regarding a CAB member's role

needs to be communicated to participants in advance to avoid confusion. The role of a CAB can vary for the different needs of studies, and so it is critical to clarify where they can play a role in the study to avoid future tension in the collaboration. Nonetheless, overcoming the challenges of a CAB can strengthen the relationship and trust between the community and researchers and promote the value of community insights in academic research (Mwinga & Moodley, 2015).

### **1.13 Concept Mapping**

Concept mapping can be a useful method for community engagement and collaborative planning, the initial element of Fawcett et al.'s (1995) model of community empowerment. As such, this section will explore the origins of concept mapping and why it is suitable for studies aimed for community engagement and planning.

Though concept mapping is not a relatively new tool today, its conception prior to the 21st century has been noted by McLinden (2017) as a progressive method, by creating knowledge through collaborative methods with participants. McLinden (2017) further illustrated that there are still many areas and impacts of concept mapping to explore, such as impacts of coupling concept mapping with other technologies (e.g., social network analysis with concept mapping to explore the reasoning behind statements and networks of participants). It was suggested that the effectiveness of concept mapping in applied planning and evaluation projects has not been shared to its full extent. This thesis sought to uniquely explore the integration emotion mapping and concept mapping can bring to the planning of stress and resiliency in communities.

Concept mapping was first conceptualized at Cornell University in 1972 by Novak to examine changes in students' learning of scientific concepts over the course of 12 years and to consider whether children could learn abstract concepts (Novak & Cañas, 2006). Novak studied the changes children experienced from lessons through recorded tapes but it soon became difficult to review the extensive amount of tapes and to understand how changes led to outcomes (Novak & Cañas, 2006). The development of concept mapping was based on Ausubel's (1963, as cited in Novak & Cañas, 2006) Assimilation Theory to capture the development of new concepts from prior understanding, the hierarchical relationship of concepts, and new relationships from previously separate concepts. The use of concept mapping continued to "help students learn how to learn meaningfully" (Novak & Cañas, 2006, p. 178). This method complements the strengths-based approach of the empowerment model in the collaborative planning phase, in which strengths and needs are assessed before desired outcomes (Fawcett et al., 1995). Both strategies focus on participants' prior strengths and knowledge and utilize these pieces to lead to outcomes.

Concept mapping is based on the constructivist epistemology as the creation of concept maps were considered new and evolving knowledge created by participants (Novak & Cañas, 2006). As described by Trochim (1989), "concept mapping is a type of structured conceptualization which can be used by groups to develop a conceptual framework which can guide evaluation or planning" (p. 1). Applying research studies to real-world settings often requires balancing conflicting stakeholder perspectives on the implementation of changes and using concept mapping is one approach to considering how

different groups of stakeholders may perceive and be impacted by the implementation of change (A. E. Green, Fettes, & Aarons, 2012).

Vaughn, Jones, Booth, and Burke's (2017) study found community-engaged or participatory research studies identify concept mapping as a suitable tool because of its required power sharing process. Participants can be involved in all stages of concept mapping, from decision-making of the focus of concept mapping to the interpretation of the final concept map. It is recommended by Vaughn et al. (2017) to include participants in all stages of concept mapping to strengthen outcomes of research and to improve the sustainability of the research findings.

Concept mapping has been argued to be a step forward from collecting data using focus groups and administering surveys because of its elements of participant engagement in creating new knowledge and triangulating data through a mixed-methods approach (A. E. Green et al., 2012). Instead of conducting research on communities, concept mapping proves to be most effective when participants are involved in decision making from the beginning of research to deciding how data should be used (A. E. Green et al., 2012). Part of the process requires that all participants take part in brainstorming and structuring the data independently (Kane & Trochim, 2007). This can help to overcome some of the limitations of focus groups, such as dominating voices and lack of participant engagement (Minh, Patel, Bruce-Barrett, & O'Campo, 2015).

In one study, concept mapping was adopted to assess what service gaps youth, parents of youth, and local service providers perceived in their local neighbourhood in Toronto, Ontario (Minh et al., 2015). The stakeholders and supporting research team

determined five clusters of service gaps as a result that could inform the need to consider youth development in future service design and implementation. With the opportunity to visually represent and organize conflicting views, they found opposing opinions between service providers and youths, and age groups of youth. This suggests if the community assessment had not created an inclusive space for youth participants, key perspectives would be missed. This study demonstrates effectively how concept mapping considers all statements made by participants and can include participants in all stages of the research process.

#### **1.14 Research Questions**

As this community psychology study is nested within a larger body of research, it is important to clarify the central research questions. Though the study relies on the results of the first phase, the second phase that is action-oriented and focused on creating change with a Toronto community is the central piece. The study examines the following:

1. What chronic stressors are participants in high chronic stress communities experiencing?
2. What strategies do residents and/or employees identify to reduce or remove chronic stressors?
3. How effective is concept mapping as a tool for engaging community members to understand chronic stressors and identify potential strategies?
4. Do residents and/or employees of high chronic stress and low resilience neighbourhoods perceive their communities as high chronic stress and low resilience?

### **1.15 Research Objectives**

As a community psychology study, the study sought to action to address issues of chronic stress and low resilience by identifying, engaging, and empowering a Toronto community that may be experiencing high chronic stress and low resilience. The community knowledge will include details of existing local challenges driving chronic stress, as well as existing assets (and by extension gaps in assets) of the community that could be built on by community and city stakeholders to improve resilience over time. The identification of specific kinds of change was intended to be left to community members that took part in this study. It was anticipated that the community knowledge created through concept mapping could be used by the community to advocate for improvements in their neighbourhood, and by the researchers of this study to support these community-led actions.

## Chapter Two: Methods

### 2.1 Research Paradigm – Pragmatism and Social Constructivism

This was a sequential mixed-methods study (i.e., Quan -> QUAN + QUAL) (Padgett, 2012), and used both the lens of pragmatism and social constructivism as guiding frameworks. As detailed by Johnson & Onwuegbuzie (2004), the pragmatic paradigm is focused on rejecting and uniting philosophical dualisms to conduct research. As a major contributor to the pragmatic approach, Dewey uses the pragmatic approach to break down the divide between realism and idealism and to inquire about the nature of human experience (Morgan, 2014). Pragmatism does not focus on one set of unique truths to guide research but taking an empiricist approach to determining methodologies that would be appropriate for the research's purpose (Johnson & Onwuegbuzie, 2004). As such, the purpose of this research study, reducing adverse outcomes linked to neighbourhood chronic stress guided the research design of a mixed methods and sequential study.

As an action-oriented study, it sought the voices of the online community and targeted high chronic stress and low resilience neighbourhood to understand what stressors are contributing to experienced high levels of chronic stress and low resilience. Further, pragmatism also promotes eclecticism and pluralism as in using different theories and methodologies, even though they can be conflicting to understand the world and human experience (Johnson & Onwuegbuzie, 2004). Often mixed methods researchers find the pragmatic approach can aid in guiding how to determine appropriate methodologies, whereas constructivist and positivist approaches have strict qualitative or quantitative methods. This supported the study's reasoning behind the use of multiple theories and



frameworks and mixed methods research design. The tools were chosen to serve the study's central objective and for their usefulness. However, as highlighted by Morgan (2014), though mixed methods research often adopts pragmatic worldviews, pragmatism does not necessarily lead to mixed methods research but instead, the methodologies that are suitable and work for the research's purpose.

The pragmatic paradigm guided both phases of this study, including the Twitter analysis and concept mapping with participants. As reality is constructed by human experience, there is not one defined reality (Johnson & Onwuegbuzie, 2004), which will help understand the differences between the research findings of both methodologies. The online community may express a relatively high amount of chronic stress, whereas the selected neighbourhood may or may not identify with Phase 1's results but this does not result in one reality being true and the other being false. Both realities were constructed by their human experience, as a pragmatic researcher would argue (Johnson & Onwuegbuzie, 2004) and what the study instead focused on is what and who may be interested in these findings. The study's overall purpose was piloting a method to strategize solutions for neighbourhood chronic stressors for neighbourhood users that could include community organizations and city leaders. Thus, the study recognized both realities and sought to understand why differences arise within the research outcomes.

Though the pragmatic paradigm was used to guide the entirety of the study, the methodology of Phase 2 also considered the social constructivist paradigm to help understand how knowledge is constructed. The social constructivist paradigm focuses on "language, communication, subjective human experience and the meaning that people

make of their experiences in their historical, social, cultural and political contexts” (Nelson & Prilleltensky, 2004, p. 262). Thus, similar to the pragmatic paradigm (Johnson & Onwuegbuzie, 2004), reality changes with human experience and is dependent on how those users make sense of their reality. This paradigm best guided the second phase of my research, in which we relied on participants’ generated dialogue and reflection, and a trusting relationship with them (Nelson & Prilleltensky, 2004) to conceptualize what neighbourhood challenges are leading to emotional stress and following, some related strategies. Thus, the study recognized that these findings are unique to this neighbourhood but sought to understand how effective the methodologies are to draw out neighbourhood members’ voices. It also relied on stakeholders of the CAB and concept mapping session to be “active change agents” and “active producers of information and content” (Pinkett, 2000, p. 2).

Padgett (2012) stated that positivists and constructivists have a strong disagreement upon generalizability, such that “a consensual set of criteria would raise the specter of intrusive oversight reminiscent of positivism” (p. 204). This runs parallel to the objectives of this study, that asset-based solutions are identified through the stakeholders’ voiced perspectives and thus, overgeneralizing data can reduce these views in community engaged research.

Further, in recognizing that the community members of this study are the generators of the community knowledge, such as the chronic stressors that pertain to their neighbourhood, it is intended that community members have ownership and can make meaning of this knowledge beyond the end of this thesis study. As such, the end of this

thesis study is not intended to conclude that the work is finalized with the community, rather that it has piloted a method for change, and continued work is needed to be done with community members to create change. The community members, the active change agents can take this knowledge and mobilize it to create the changes needed to improve their neighbourhood. These changes can be made by sharing and strategizing with this community knowledge with city leaders and community partners. This is a part of the knowledge translation and mobilization plan that will be later discussed.

## **2.2 Research Context**

This research study took place in one neighbourhood in Toronto, a city that is uniquely described by Hulchanski (2010) as three distinctive cities of neighbourhoods. Hulchanski (2010) characterized these three cities by low-, middle-, and high-income. Further, these three cities have seen dramatic changes between 1970 and 2005, as the middle-income neighbourhoods shrunk in size by 20%, creating a polarization between low and high-income neighbourhoods. Within the 35-year period (1970 to 2005), the significant increase in Toronto's low-income areas in comparison to high-income areas suggest middle-income areas have joined them and these low-income areas have since been pushed to the outskirts of the city as a result of gentrification.

As discussed by Walks, Dinca-panaitescu, and Simone (2016), the effects of gentrification are seen in an increase in social problems, including low funding for local schools, high demand for social services, and lack of and poor social infrastructure. Though income polarization and income inequality are continuing upward trends, Hulchanski (2010) has suggested strategies of making housing affordable and increasing transit and

services in priority neighbourhoods to reduce residential segregation. If no significant changes are made to alter the trends seen in the low-, middle-, and high-income cities of Toronto, it was anticipated by Hulchanski (2010) that by year 2025, solely low and high-income cities will be seen.

There is an evident need to improve Toronto neighbourhoods and continual efforts have been made to better neighbourhood wellbeing. These efforts include the City of Toronto (n.d.)'s Strong Neighbourhoods Strategy 2020, which is focused on achieving neighbourhood equity through the efforts of residents, use of resources (e.g., accessible services, programs, public spaces and amenities), and changes in public policies that better support neighbourhood needs. Similarly, United Way Greater Toronto (n.d.) advocated for neighbourhood change through the Building Strong Neighbourhoods Strategy, which continues to concentrate its investments in the city's priority neighbourhoods, promotes community-engagement initiatives, and improves access to community services, programs and spaces. These efforts suggest that the city of Toronto and its residents are open to strategies that create long lasting and sustainable changes for the improvement of priority neighbourhoods and thus, making this city a feasible option for this research study.

Many data sources are also available to complement strategies for neighbourhood improvement. In 2016, the City of Toronto (n.d.-b) created Wellbeing Toronto, an online mapping application that illustrates how neighbourhoods are performing on a series of indicators based on recent census data. It is promoted as a tool for academic researchers, urban planners, businesses, and community residents to access data visually and interactively. The online mapping tool can provide and combine indicators from eleven

categories, including demographics, civics and equity, economics, education, environment, health, housing, recreation, safety, transportation, and culture to reveal information about any of the 140 neighbourhoods the city outlines.

Similarly, the City of Toronto, Centre for Research on Inner City Health at St. Michael's Hospital, United Way Toronto, and Woodgreen Community Services partnered to create Urban HEART @Toronto, which considered how the 140 Toronto neighbourhoods performed on five domains, including economic opportunity, social and human development, governance, physical environment and infrastructure, and population health (Toronto Community Health Profiles, n.d.). This data helped identify 31 neighbourhoods that were in need of supports and resources as they ranked below expected targets across the five domains and subsequently, this data was used for the City of Toronto's (n.d.-a) Strong Neighbourhoods Strategy 2020. Thus, both Wellbeing Toronto and Urban HEART @Toronto are powerful data sources for research studies related to neighbourhood improvement and starting points for community engagement. As such, these two data sources are used as part of Phase 1.

### **2.3 Research Design of Phase 1**

Phase 1 was led by my thesis advisor, Dr. Ketan Shankardass and thus, the planned design of this phase is concisely and not elaborately discussed. The purpose of Phase 1 was to identify a Toronto community that is experiencing high chronic stress and low resilience. This was dependent on a series of methodologies beginning with the online Twitter community. First, Tweets that were geotagged to the City of Toronto and came from public Twitter profiles over one-year periods between 2013-14 and 2017-18 were gathered.

These two time periods were chosen to select a community that experienced stress over time (i.e., chronic stress) and because 2013-14's Tweets were gathered for another study that is part of the larger *Stresscapes* research, they were conveniently used for this study as well. EMOTIVE software was used to identify Tweets that express the emotion of stress. Spatial cluster analysis methods and LISA were used to identify spatial areas that indicate high stress. Following, to adhere to the neighbourhood boundaries that the city of Toronto has outlined, the spatial boundaries of high-low clusters were overlaid with the City of Toronto's neighbourhood boundaries. The candidate neighbourhoods have shown consistently or increasingly high levels of stress over time.

Wellbeing Toronto and Urban Heart @Toronto are useful public data sources for neighbourhood planning as they adhere to the neighbourhood boundaries created by the city and thereby allows for comparison to other statistical data that follow the city's neighbourhood groupings. On the other hand, these data sources rely on census data that is limited in spatial and temporal resolution and thus, dependent on data illustrating a snapshot in time and bounded by neighbourhood classifications which may miss communities in need. These data sources should still be included as they may reveal key insights to neighbourhoods and thus, help identify priority neighbourhoods for this research study. Thus, both Wellbeing Toronto and Urban HEART @Toronto data sources were used to identify a final group of high problem neighbourhoods, with not only higher levels of stress over time and lower levels of resilience, but also considering social, economic, and health data.

Through Urban HEART @Toronto, data of unemployment, social assistance, and high school graduation were chosen to indicate levels of stress within the neighbourhoods. The rates of unemployment and social assistance are grouped under economic opportunities of Urban HEART and related to economic stress. The rate of high school graduation is grouped under social and human development of Urban HEART and also positively correlated with health outcomes (American Public Health Association, 2018). Data of municipal voting, community places for meeting, and green space were chosen to indicate levels of resilience within neighbourhoods. The rate of municipal voting is grouped under governance of Urban HEART and suggestive of social participation. The number of community places for meeting and green spaces are grouped under physical environment and infrastructure of Urban HEART and suggestive of public spaces available for socializing with others and recreation use. Lastly, data of mental health and preventable hospitalizations were chosen to indicate levels of disease. This data was grouped under population health and as such, suggest the overall health of the neighbourhoods.

Through Wellbeing Toronto, data of home repairs needed, shelter costs, rent bank applicants, crime, and pedestrian or other collisions indicated stress, as this suggests shelter, safety, and financial challenges that could impact stress. Data of non-movers and the Early Development Instrument (EDI) indicated resilience. The rate of non-movers indicates that individuals have stayed in the same residence for more than five years and the EDI suggests that children are measuring up to the age-appropriate developmental expectations.

Using EMOTIVE's findings and data provided by Wellbeing Toronto and Urban HEART, we used the method of triangulation, a validation strategy of using multiple sources to comprehensively understand a complex phenomenon (Padgett, 2012). By choosing to not rely on a single source of data, a holistic perspective is gained of the numerous factors that may affect a community's level of stress and resilience.

Crescent Town, a Toronto neighbourhood was selected within the final group of priority neighbourhoods for Phase 2. Based on the results of triangulation, this neighbourhood held the highest overall score for indicators of high stress and disease and low resilience. A literature review of Crescent Town was conducted to learn of any previous stress-related research that may have been conducted for this neighbourhood and will be presented next.

#### **2.4 Background of Crescent Town Neighbourhood**

According to its Neighbourhood Profile for 2016, Crescent Town, also known as Taylor-Massey is located within East York of Toronto, Ontario with a population of 15, 683 residents (SPAR, 2018). Further, this neighbourhood is largely made up of the working age group (60.2%) with residents aged between 25-64; and consists of a high percentage of renter households (67.2%) compared to Toronto's proportion of renter households (47.2%). A high proportion of private dwellings are in high-rise apartment buildings with five or more storeys (77.2%) and 28.9% of private households are considered unsuitable housing as there are insufficient bedrooms based on size and composition. Whereas 37% of Toronto residents use public transit to travel to work, 63.6% of residents do so in this neighbourhood.



In regards to its residents, the Neighbourhood Profile indicates that the majority of the neighbourhood residents' mother tongue is not English (57.2%) with Bengali being the language most often spoken (SPAR, 2018). Further, more than half of its residents are immigrants (56.2% compared to Toronto at 51.2%) and 16.1% of them are recent immigrants compared to 7% of Toronto's residents. There is also a higher visible minority population in this neighbourhood (66.9%) in comparison to the rest of Toronto (51.5%). A slightly higher proportion identify as Aboriginal (1.5%) compared to the rest of Toronto (0.9%). The median household income is approximately \$47k compared to the rest of Toronto at approximately \$66k and 35.2% of residents are considered experiencing poverty compared to the rest of Toronto at 21.9%. A slightly higher proportion of residents hold either a bachelor's degree or higher (44.3%) compared to Toronto's proportion (44.1%). Lastly, 11.5% of neighbourhood residents are unemployed compared to the rest of Toronto (8.2%).

Through an online and in-person environmental scan of Crescent Town, it was found the neighbourhood is identified as one of 31 Neighbourhood Improvement Areas (NIAs) of the Toronto Strong Neighbourhoods Strategy (TSNS) 2020 (City of Toronto, n.d.-a). As a part of TSNS 2020, additional investments will be provided to the 31 NIAs "to remove the differences between our neighbourhoods that are unjust, unnecessary, and unfair" (City of Toronto, n.d.-a, p. 4). Prior to this strategy for 2020, Crescent Town was also one of 13 priority investment Toronto neighbourhoods identified by the City Council in 2005, which led to the investment of a Community Hub, also known as AccessPoint on Danforth that provides a range of services for the community's needs, including services for

newcomers, youth, older adults, community groups, and more (Strong Neighbourhoods Task Force, 2005).

As a part of this strategy in 2005, the Action for Neighbourhood Change (ANC) was created to support residents into creating communities that meet their unique needs, such as the creation of a tenant school in 2012 to equip tenants with the understanding of their legal rights (East York Tenants Group, 2012; Milley, 2012). This neighbourhood is also home to the Neighbourhood Link Support Services, a non-profit organization that is funded by all levels of government, the United Way Greater Toronto, and community members, and provides services for seniors, newcomers, youth, and others in need of employment support (“Neighb. Link Support Serv.,” 2019).

Situated within the Crescent Town apartment and condominium complex is the non-profit facility, Crescent Town Club, maintained by York Condominium Corporation No. 76 and Pinedale Properties (“Crescent Town Community Centre,” 2009). The Crescent Town Club provides a free membership to residents of the condominium and apartment complex and is committed to providing access to recreational, athletic, and day care facilities and programming to its members (“Crescent Town Community Centre,” 2009).

In a 2007 report of Crescent Town, it was identified that Crescent Town and Secord are distinct communities that are geographically defined as one neighbourhood as per the City of Toronto and thus, jointly identified as one of 13 priority neighbourhoods (Boston & Meagher, 2007). There were several different themes of concerns identified by residents and service providers within physical infrastructure, individual and family issues, and community development. As such, challenges, opportunities, and strategies for these

concerns for the Crescent Town Club were concluded in the report. In addition, a service map of all nearby programs and support services for residents with a range of needs are also included in the report.

A scan of the keywords, “Crescent Town” and “stress” within Wilfrid Laurier’s library database and Google Scholar from 2013 to 2019 found eight relevant sources, including one book chapter, two scholarly articles, one report, and four dissertations. These publication dates were chosen to correspond with the years of the Twitter analysis beginning in 2013. However, no relevant sources were found for “Crescent Town” and “resilience”, suggesting that resiliency has not been studied in relation to Crescent Town specifically. Though Taylor-Massey is the neighbourhood’s most recent title, it is less frequently used to describe the neighbourhood and more often used to describe Taylor-Massey Creek, thus, the literature found for Taylor-Massey is not related to the focus of the neighbourhood.

The identified sources do not focus on emotional stress solely, rather they do focus on the immigrant population, including experiences of multiculturalism (Liguori, 2015), employment (Gottfried et al., 2016), and migration (Ireland, 2017). Some specifically focus on the subpopulation of South Asian immigrants, including this group’s levels of social participation and motivation behind this participation (Ranu, 2013), mental health outcomes and relevant programming (Islam, 2014), and experiences as Bangladeshi Muslim immigrant women with ethnic businesses (Akbar, 2016). Another source focuses on art programs designed for priority neighbourhoods in Toronto, including Crescent Town (Leslie & Hunt, 2013). Lastly, one report illustrates the AccessPoint on Danforth

Green Roof, which provides an environment for community engagement, improves access to local food and education regarding environmental health and more to community members (Guo & Mrosovsky, 2014). The above identified sources of data evidently showcase pre-existing literature surrounding the neighbourhood of Crescent Town and interest in the experience of the South Asian immigrant population within the neighbourhood.

Within news articles dating from 2013, a search of Crescent Town leads to over 100 news article results on various Toronto news outlets, including the Toronto Star, the Beach Metro, the Toronto Observer, Toronto.com, and more. Neighbourhood schools were a common topic of news. There have been reports of the consequences of frozen funding for East York schools, including the reliance on portables, which are temporary classrooms that have been used as permanent classrooms to meet overcrowding needs in the area's public schools (Lameira, 2013). As a result, there are a lack of resources for students to participate in programs (Lameira, 2013). Students learning in these portables also have to handle its deteriorating conditions as they were built two decades ago and meant to be a temporary solution (Landau, 2015). Though the funding freeze was lifted later, it was seen that overcrowded conditions still needed to be improved (Hudson, 2013). Some news reports also indicated that parents protested these issues through a petition (Lameira, 2013) and a walkout (Landau, 2015).

One news article also analyzed Toronto District School Board (TDSB) data from 2012-13 and ranked Toronto elementary schools by lowest to highest funding, which is fundraised by schools and school councils through "student activity fees, money raised by

parent councils, field trips, model school allocation and learning-opportunity-grant allocations” (Chiose, Alphonso, Hammer, & Agius, 2014, para. 3). The four elementary schools within this neighbourhood are Crescent Town Elementary School, Secord Elementary School, George Webster Elementary School and William J. McCordic School with respective rankings at 322, 329, 370 and 111 out of 469 schools (Chiose et al., 2014). It was highlighted that schools within most affluent neighbourhoods have 300 times more funds from fundraising than schools with greater needs, which can lead to unequitable access to resources for students (Chiose et al., 2014).

Within classrooms, some news articles discussed immigrant or newcomers’ experiences, particularly students’ experiences. One news article highlighted the diverse racial and ethnic backgrounds represented in the Crescent Town student population and as such, parents are recognized as assets to the community and regularly asked to share their lived experiences with students (McCorry, 2016). Another news article mentioned the resources available at school for Syrian refugee children, including settlement workers, one community support worker, and free access to medical services (Brown, 2016). Teachers and students are also understanding of the language barrier by incorporating activities with non-verbal communication and befriending one another in understanding the experiences of Syrian refugees (Brown, 2016). Lastly, in 2013, a new Crescent Town elementary school principal, Harpreet Ghuman, was noted for bringing a focus on students’ heritage, engaging families, the community, and community partners, and conducting school outreach (Rushowy, 2014).

## **2.5 Research Design of Phase 2**

Phase 2, the focus of this thesis, employed concept mapping, a mixed-methods approach to conceptualizing knowledge for planning and evaluation (Trochim, 1989). In Phase 2, two groups of participants were sequentially recruited and invited for the goal of community engagement. An environmental scan, which typically encompasses a combination of online and in-person methods (Graham, Evitts, & Thomas-MacLean, 2008) was conducted for Crescent Town neighbourhood to identify suitable recruitment methods. The neighbourhood was scanned online and in-person to identify whether it was a residential, business, or a mixture of both types of neighbourhoods so it was noted whether purely homes, businesses, or a mixture of both existed to decide on the recruitment strategy. In addition, the neighbourhood was noted online and in-person for all the public spaces that would be appropriate to post flyers or conduct in-person recruitment.

The aim was to first recruit five participants to form the study's community advisory board (CAB), which could provide an opportunity for collaboration between communities and researchers and promotion of a community's valuable insight within research. More specifically, the CAB would provide feedback to proposed recruitment strategies for concept mapping participants, to methods and plans for disseminating the findings, and the accuracy of the EMOTIVE results. Considering the potential negative implications of disseminating findings of a study that highlights a particular Toronto community with high chronic stress and low resilience, the CAB was asked to help strategize and consider how the dissemination of the study can benefit and more accurately depict the community's experiences. As such, the CAB was asked to discuss the

results of Phase 1, including whether they agree with the EMOTIVE results. Discussions with the CAB were intended to add external validity to our findings by bringing in the perspective of neighbourhood users to bear on the findings of Phase 1 and 2 data (e.g., spatial analysis and concept mapping).

For the main study, the aim was to recruit 22 neighbourhood users to provide an understanding of why the triangulation of EMOTIVE and other administrative data indicated this community is experiencing a higher level of chronic stress and lower level of resilience than other areas of Toronto. Again, the recruitment strategy was dependent on whether the identified neighbourhood was residential, business, or a mixture of both. Participants were recruited to take part in concept mapping, a mixed-methods approach to list existing neighbourhood chronic stressors and assets that they have experienced or accessed. Following, they sorted the statements based on relevance and importance and represented the clusters visually through a statistical process that is supported by the researcher (A. E. Green et al., 2012). The finished cluster map is a unique and collaborative product showcasing the community's individualized understanding of chronic stress and community resilience. Neighbourhood users used the results of concept mapping to understand sources of chronic stress within the neighbourhood, but also neighbourhood assets that can be built upon to strategize solutions for these chronic stressors.

## **2.6 Participants**

In recruiting the CAB and concept mapping participants, I used purposive sampling to ensure CAB members and participants can provide relevant perspectives and knowledge (Padgett, 2012). I also used snowball sampling to recruit concept mapping participants, in

which those who expressed interest in participating were asked to share the recruitment flyer with their family, friends, and colleagues in the neighbourhood (Padgett, 2012). This type of sampling was decided in replacement of others, such as convenience sampling, as we intended to retain participants that can provide relevant expertise and contribute to the understanding of the community's stress and resilience. Thus, the sample size of both groups were decided based on feasibility, by ensuring the study's budget can appropriately compensate all participants for their time, and utility, by ensuring that the sample size will likely generate enough data to work within concept mapping and represent the community effectively. With funding grants or limitations, the sample size of the CAB and concept mapping participants changed accordingly.

**Community Advisory Board.** We intended to recruit five participants to partake in the CAB who can represent different views during meetings with the study's researcher but also suitable to the time and efforts required from participants. For example, if we recruited many CAB members, it could be extremely time consuming for every member to have an opportunity to discuss each other's views. The intended sample was a group of participants who were aged 18 and above, represented diverse ethnic and gender groups, and have a clear link to Crescent Town (i.e., as a resident or an employee). We also prioritized interested candidates who can clearly demonstrate they have an interest in neighbourhood change (e.g., they have previously volunteered for a community event to improve an aspect of the community) so meetings can draw from different experiences.

**Concept Mapping Participants.** Separate from the CAB, we intended to recruit a sample size of 22 participants and the number of different neighbourhood users was



dependent on if the neighbourhood is primarily residential, business, or a mixture of both kinds. We sought to recruit a mixture of different community members (residents, employees, and business owners) as Crescent Town is a mixed-use neighbourhood with a diverse range of ages (18+), genders, employment statuses, ethnicities, education levels, and income levels. No other prior expertise was necessary, so long as participants had a clear link to Crescent Town and were willing to share their experiences through concept mapping.

## **2.7 Data Collection**

In Phase 2, I met with the CAB asynchronously and took hand-written notes for the CAB's feedback to the participant recruitment strategy, disseminating the study's findings, and their level of agreement with the EMOTIVE results. Concept mapping resulted in both qualitative and quantitative data, as participants generated responses to focal prompts, which then underwent quantitative analysis to be summarized and visually represented (Burke et al., 2005). Participants focused on experienced neighbourhood chronic stressors and neighbourhood assets, thus the study relied on self-reported data later entered into Concept Systems, Inc's concept mapping software. The last stage of concept mapping, in which participants interpreted the resulting maps through a structured group discussion was audio recorded with participants' permission. Qualitative data was collected to explore participants' identified asset-based solutions to target the neighbourhood chronic stressors and how concept mapping has facilitated this process.

## 2.8 Procedures

**Environmental Scan.** In Phase 2, I conducted an environmental scan through physical touring of the neighbourhood and online scans of local organizations to explore potential connections that may aid in promoting recruitment for the study. I used field notes during the environmental scan to choose appropriate recruitment methods for CAB members. These field notes depicted the neighbourhood type (i.e., residential, employment or both), the local organizations that provide support to community members, online social groups the community uses, and public frequent spots that would be suitable to recruit participants.

**CAB.** Participant recruitment was done by sharing the study's recruitment flyer with public bus shelters, local community organizations, businesses, public libraries, online community groups (i.e., Facebook social groups for community members), and high-rise buildings that would be willing to share the flyer in their mailrooms (see Appendix A). Interested candidates completed a screening survey and completed their contact information in the form of a phone number or email address. The screening survey clarified that the demographic information would not be reported to protect their privacy.

Once the CAB was recruited, the members were provided a consent form explaining the purpose of the study and the CAB, and their total compensation of \$40 in the form of gift cards of their preference (see Appendix B). A terms of reference was discussed with the CAB members asynchronously to ensure we all had clear expectations about the CAB's involvement in the study. As per some of the challenges experienced by Shubis et al. (2009) in collaborating with a CAB, it is critical that clear roles and expectations are communicated

with the CAB members. Thus, any concerns of the CAB members were addressed early on in this partnership.

During the first meeting, the CAB was asked for suggestions of the most suitable places to recruit 22 concept mapping participants with diverse backgrounds and experiences based on their insight. The recruitment flyer was shared amongst their places of suggestions, including public bus shelters, local community organizations, businesses, public libraries, online community groups (i.e., Facebook social groups for community members), and high-rise buildings that would be willing to share the flyer in their mailrooms (see Appendix C).

At the second time of contact, the CAB was asked to review the planned focal prompts that were to be used for concept mapping. The CAB was asked to review these focal prompts through a prepared online survey and list any potential points for confusion for participants in the survey's section for feedback. In addition, any questions that the CAB had regarding concept mapping were answered during this meeting.

The third meeting was held to discuss the dissemination of the findings in prioritizing the community's benefit, the accuracy of Phase 1's results and so forth, to not limit discussion. The CAB were also presented with the findings of concept mapping to explore any points of interest they may have. Having the CAB's involvement further enhanced Phase 2 of the study by providing the insights to best engage and empower the community in stress and resilience planning.

**Concept Mapping.** Participant recruitment was done in-person and by posting recruitment flyers at high-rise building public spaces, public bus stops, businesses, community centres, and the local library as per the findings of the environmental scan and the CAB's suggestions. Online recruitment was also done by sharing the recruitment flyer on websites, including Kijiji and Facebook group pages for the neighbourhood and community centres. Interested candidates completed a screening survey and completed their contact information in the form of a phone number or email address. The screening survey clarified that the demographic information would not be reported to protect their privacy.

Participants invited for concept mapping have a direct link to the neighbourhood as either a resident, employee, student, or other user to provide a range of perspectives on existing neighbourhood chronic stressors and assets. CAB members were also invited to attend concept mapping as they are also neighbourhood members. Participants were compensated \$110 in the form of preferred gift cards.

As outlined by Burke et al. (2005), steps for concept mapping include preparation, generation, structuring, representation, interpretation and utilization of findings (see Appendix D for the detailed concept mapping research protocol).

Once preparation of having established research goals and recruitment of participants were finished, participants were invited to two sessions held on two consecutive Saturday mornings in a booked private room of the local public library for the stage of generation. Participants were provided with consent forms (see Appendix E), introduced to the study, its interests (i.e., chronic stressors and neighbourhood assets), and

the process of concept mapping. To respond to the following two focal prompts, they were instructed to list existing neighbourhood chronic stressors and assets on the provided paper:

1. One issue in this community that causes chronic stress for you and/or others over time is \_\_\_\_\_.
2. One existing asset in this community that benefits you and/or others over time is \_\_\_\_\_.

It was also suggested to participants that they may ask myself or my thesis advisor for aid in completing this task, either to aid in writing their ideas down or for further clarification of the focal prompts. Participants were then asked to take a break while the researchers prepared for the next stage. My thesis advisor and I then entered the generated statements into the software for the idea synthesis stage. As explained by Kane and Trochim (2007), during this stage we focused on synthesizing all the statements through removing statements that represented similar ideas and editing statements to ensure they clearly represent the idea. Idea synthesis is meant to create a manageable set of statements for the participants to rate and sort in the next stage. However, it should be noted that in using two focal prompts, an extremely high number of statements were generated, and despite synthesizing all ideas, the number of unique statements was large enough to not be manageable for all participants to complete the next stage of structuring using all of the statements.

In the stage of structuring, it was intended for participants to group both sets of statements (i.e., chronic stressors and assets) based on similarities and following, rate the

importance of each statement on a Likert scale (Kane & Trochim, 2007). Participants were asked to rate each statement based on the following question:

1. How would you rate the importance of these neighbourhood issues and assets from 1 (weak) to 5 (strong)?

However, as the number of unique statements exceeded the ability for participants to organize and rate statements within the required timeframe, participants were assigned to organize either the chronic stressors or the assets. They then noted the details of their created piles on the provided activity sheets. Participants that were willing to complete the rating activity were provided the rating sheets and were asked to complete the rating portion for the set of statements they were assigned to group. They then returned these to my thesis advisor and I for the next stage of analysis. The potential complications as a result are discussed later in this thesis.

Participants' data was then entered into the concept mapping software, GroupWisdom to be represented visually in a 2D point map (Concept Systems Inc., 2017). As explained by Kane & Trochim (2007), the entered data is organized by the software in a matrix, in which each row represents one participant and each column represents one statement generated through the brainstorming stage. The corresponding value of each participant and statement is the pile number that the participant sorted the statement into. The value ratings of each statement are then calculated as a group average.

As A. E. Green et al. (2012) described, the software also computed a similarity matrix from the entered data for each participant, where each row and column represents

one generated statement. The total value is either 1 to represent that they were piled together or 0 to represent that they were not piled together. For example, row 12 and column 16 represent statements 12 and 16 respectively and the corresponding value would be 0 if they were not piled together by the participant. The values are then summed for all participants to create an overall square symmetric matrix which is then used for multidimensional scaling (MDS) analysis to calculate the total distance between statements based on participants' grouping data and plotted on a 2D point map with x and y values. Further, a stress value is produced to describe how representative the created map is of the participants' data, ranging from 0.205 to 0.365 with lower values representing a better reflection (Kane & Trochim, 2007).

Next, as Kane and Trochim (2007) suggested, the MDS values were used to create a cluster map or cluster solution through agglomerative cluster analysis and Ward's method as conducted by the software. Agglomerative cluster analysis combines initially separate elements into one single cluster and Ward's method reduces "the sum of the distances between all statements in any two hypothetical clusters that might be joined" (Kane & Trochim, 2007, p.99). The final number of clusters used to represent the different groups of statements was determined by me and my thesis advisor. This decision was made by considering if the number of clusters reflected all the ideas of each group of statements and increasing or reducing the number of clusters would be grouping or separating unique ideas together. Once the number of clusters were determined, my thesis advisor and I also predetermined each cluster's label. We first reviewed the labels that were suggested by the software's algorithm, which were based on participants' labels for the piles they created

during the structuring stage. These labels were then edited to better reflect each cluster, but I was prepared to edit these labels as per participants' feedback in the next stage of interpretation.

In addition to the 2D point map and cluster map, a cluster rating map was also prepared for participants to review. The cluster rating map depicts the average rating of each cluster of statements (Kane & Trochim, 2007) and was used to highlight which cluster was more highly rated as important based on participants' rating data.

Lastly, through the software, anchoring or bridging analysis was also conducted to learn of the anchoring or bridging value of each statement on the 2D point map (Concept Systems Inc., 2017; Kane & Trochim, 2007). The anchoring or bridging value ranges from 0 to 1, where a high value will suggest that the particular statement plays the role of essentially bridging its surrounding statements and a low value will represent that the statement was grouped particularly because of its similarity with the surrounding statements by a majority (Kane & Trochim, 2007; Nadeem, Stoyanov, & Koper, 2011). These values were used for me to understand how each statement was more or less appropriately grouped in the cluster.

During the interpretation stage, the participants reviewed the cluster map and considered whether the results represented their perspectives of existing neighbourhood chronic stressors and assets. Burke et al. (2005) highlighted the importance of giving the power of interpretation to participants to aid researchers in understanding their perception using the visual findings. Participants were asked to share their understanding of these findings and how the resulting maps could be changed to better represent their



views, such as if and which statements should be moved to a different cluster that would be more appropriate.

For the final stage, utilization, participants identified potential asset-based solutions for some of the identified neighbourhood chronic stressors by building upon existing neighbourhood assets through the structured exercise, 1-2-4-All. First, participants reviewed the cluster of chronic stressors most highly rated as important as identified through the cluster rating map. The researcher then posed the following question, “what is one of the most stressful problems for you in this cluster?” Participants were instructed to think of their response privately for one minute and then share and discuss this with the partner next to them for two minutes. Finally, this pair of participants would share with another pair next to them for four minutes. Participants were asked to build upon each other’s ideas to construct an understanding of this stressor and the nature of it. All groups then shared their discussion with the room of researchers and participants and the chronic stressors were explored with everyone.

Another round of 1-2-4-All was then conducted to focus on potential solutions for the previously discussed chronic stressors. Participants were asked to review the clusters of assets and identify a solution that either builds upon a specific or cluster of assets that have been brainstormed or consider if an asset is missing that a solution could build upon. Again, all groups shared their ideas and these potential asset-based solutions were explored through the discussion with participants. This exercise was audio-recorded with participants’ permission for further thematic analysis.

## **2.9 Establishing the Quality of the Data**

To enhance the rigor and trustworthiness of this mixed method sequential design, there are three strategies we adopted from (Padgett, 2012). First, we planned to have prolonged engagement with participants prior to establishing a CAB and conducting concept mapping sessions to enhance community engagement. We spent time building relationships with local organizations through our environmental scan, by spending longer periods of time in the community, having conversations with local service providers and neighbourhood users (i.e., residents, employees, volunteers). This increased participants' trust with us and the study and enhanced the quality of data we gathered from discussions with the CAB and results of concept mapping.

Secondly, we used both methodological and data triangulation (Denzin, 1978, as cited in Padgett, 2012) by conducting a mixed methods study and by using multiple data sources to conclude the findings. The results of Phase 1's emotion mapping tool was further paired with pre-existing data (i.e., Urban HEART @Toronto and Wellbeing Toronto's neighbourhood data) to not ignore valuable findings that provide an initial understanding of the socioeconomic conditions of each neighbourhood.

Thirdly, peer debriefing was adopted to ensure that constructive criticism is given at times when concept mapping sessions are not going as planned (Padgett, 2012). By recruiting participants to engage in a CAB and concept mapping activity, we intended to share with the power of the process with neighbourhood users, so they can best inform us how to engage with the local community. Thus, though we proposed concept mapping sessions in the latter half of the study, if the CAB members strongly voiced that this method

would create a heavy and unfair burden on residents, employees, students and so forth, we would consider other methods.

## **2.10 Data Analysis Plan**

Phase 1's emotion mapping results and triangulation with pre-existing data were analyzed by my thesis advisor, Dr. Ketan Shankardass. In Phase 2, I collected the qualitative data within meetings with the community advisory board (CAB) related to the emotion mapping results. These meetings were held asynchronously, and handwritten notetaking was used. The purpose of analyzing these meetings is to explore the fourth research question, whether participants agree with Phase 1's emotion mapping results, such that the identified neighbourhood experiences high chronic stress and low resilience. These meetings were also used to explore how suitable the method of emotion mapping is to identify communities experiencing high chronic stress.

For Phase 2's concept mapping sessions, a concept mapping software by Concept Systems, Inc. was used to visually represent the participants' data. The data collected from the stages of generation and structuring, including sorting and rating were entered into the software to be visually represented on a series of maps (Anderson & Slonim, 2017). As Kane and Trochim (2007) outlined, MDS analysis is done to plot the statements on the 2D point map based on participants' grouping data. Agglomerative cluster analysis and Ward's method were used to group statements together based on participants' structuring data. Bridging analysis is also completed to describe how relevant statements were to its surrounding components on the 2D point map (Concept Systems Inc., 2017; Kane & Trochim, 2007).

In the stage of interpretation, participants continued to interpret the resulting maps through in-person group discussions with the researcher to consider any gaps or misrepresentations of the data. This stage of interpretation was audio-recorded, transcribed and analyzed for themes. In addition to interpreting the resulting series of maps, the participants also strategized asset-based solutions based on these visual findings. This qualitative data was audio-recorded, transcribed, and analyzed for themes.

### **2.11 Ethical Considerations**

Ethical implications concerning big data can be extensive and complex, considering its potential to reduce large quantities of data to interpretations (Sagiroglu & Sinanc, 2013). First, we acknowledge that big data represents people and thus, conducting big data analysis can do harm just as all research with human participants can (Zook et al., 2017). Using big data to interpret a community as high stress and low resilience can stigmatize a community as problematic and lead to assumptions about their behavior and random commonalities as suggested by Zwitter (2014), “big data makes random connectedness on the basis of random commonalities extremely likely” (p. 5).

Secondly, there are also concerns of privacy as using geotagged Tweets to lead to interpretations that come from public profiles cannot obtain appropriate consent from participants (Larson, 2013). For this research, the likelihood of participants to be identified is nearly impossible as content of Tweets are not published, rather emotions are extracted from text to draw overall assumptions about Twitter users based on metadata of Tweet content (Sykora et al., 2013). After Tweet content was scored by EMOTIVE, a database without Tweet content was securely shared with Dr. Colin Robertson’s lab to reduce the

risk of individual Twitter users being identified. This was shared to analyze the spatial distribution of the emotional scores to identify Toronto neighbourhoods with high chronic stress.

As identified, many concerns related to the use of big data and social media analysis are expectation and privacy concerns of users, and it is the responsibility of researchers to not stigmatize and create negative implications for the community (Conway & O'Connor, 2016). We are prepared to share the findings of the study with community stakeholders and continue meeting with interested community members, including those who were involved in the study to discuss how to disseminate the findings to the public in a way that does not paint a negative light but highlights the community's resilience in the face of chronic stressors. The community members will be highly involved in the transfer of knowledge and the mobilization of the findings for changes to be made.

Having meetings with CAB members and using concept mapping to draw out information requires participants to reveal chronic emotional stressors that they have experienced, which can result in oversharing. As M. W. Smith (1995) noted, this can become problematic in group settings as opposed to interviews because of a lack of control over privacy and an increased stress as a result. As such, the participants were informed prior to participating of these potential risks verbally by the facilitator and through a written consent form, and the benefits of group discussions were considered to outweigh the potential risks of privacy and emotional strains. To avoid unethically eliciting participants' cooperation, gift cards to popular and accessible coffee shops and restaurants were distributed (Padgett, 2012). Finally, referrals to professional counselling were

provided as needed after group discussions and concept mapping sessions if participants experienced distress as a result of the process (Padgett, 2012).

## Chapter Three: Results

### 3.1 Results of Concept Mapping

A total of 23 participants were recruited to participate in concept mapping. This group of participants included 18 residents, three employees, six volunteers, one student, and one community organization member of the neighbourhood<sup>1</sup>. The total number of neighbourhood roles does not total to 23 candidates as those interested were instructed to select all neighbourhood roles that applied.

During the first workshop of concept mapping, 23 participants brainstormed 260 statements that were then consolidated into 233 unique statements (see Appendix F). Of these 23 participants, 14 participants sorted statements and 16 participants rated statements. Concept Systems Inc.'s concept mapping software was used to create the point map and cluster map (see Figures 3.1 and 3.2).

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<sup>1</sup> Demographics of participants were not included in thesis as it was indicated to interested candidates on the online screening survey that the collected data would not be disclosed.

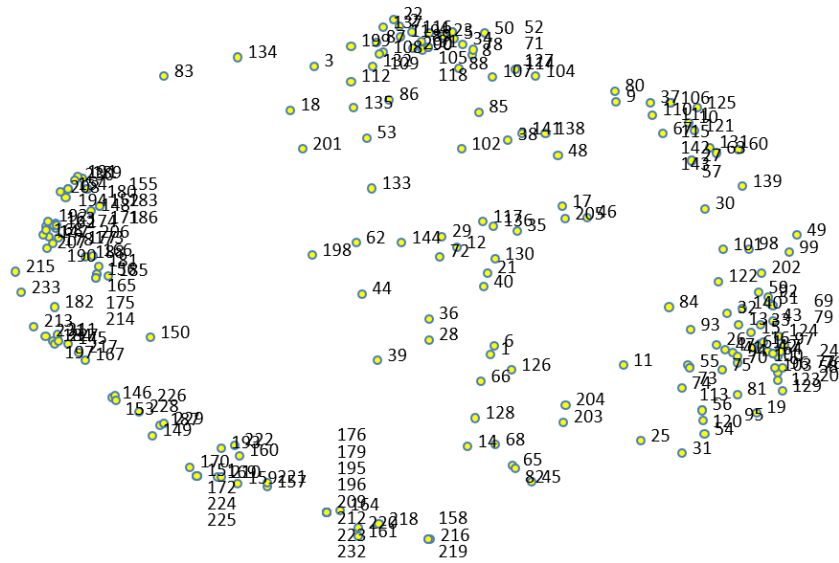


Figure 3.1. Point Map of Participants' 233 Brainstormed Statements of Neighbourhood Chronic Stressors and Assets.

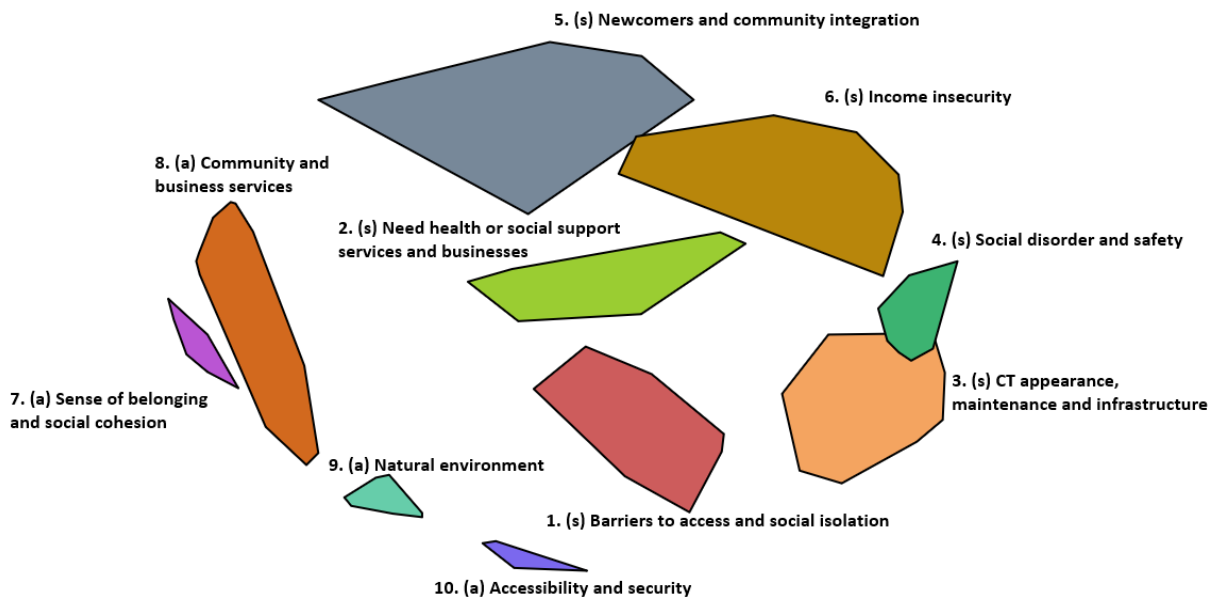


Figure 3.2. Cluster Map of Neighbourhood Chronic Stressors and Assets Prior to Participants' Interpretation of Results.



As can be seen in Figure 3.2, the number of clusters was narrowed down to 10 clusters, including six clusters of neighbourhood chronic stressors and four clusters of neighbourhood assets. These labels were further refined by myself and my thesis advisor to better represent the cluster's contents prior to participants providing additional feedback about how to label clusters to better reflect their views of neighbourhood chronic stressors and assets.

The overall importance rating of each cluster was also visually depicted through the concept mapping software in the cluster rating map (see Figure 3.3) and specific values are illustrated next (see Table 3.1).

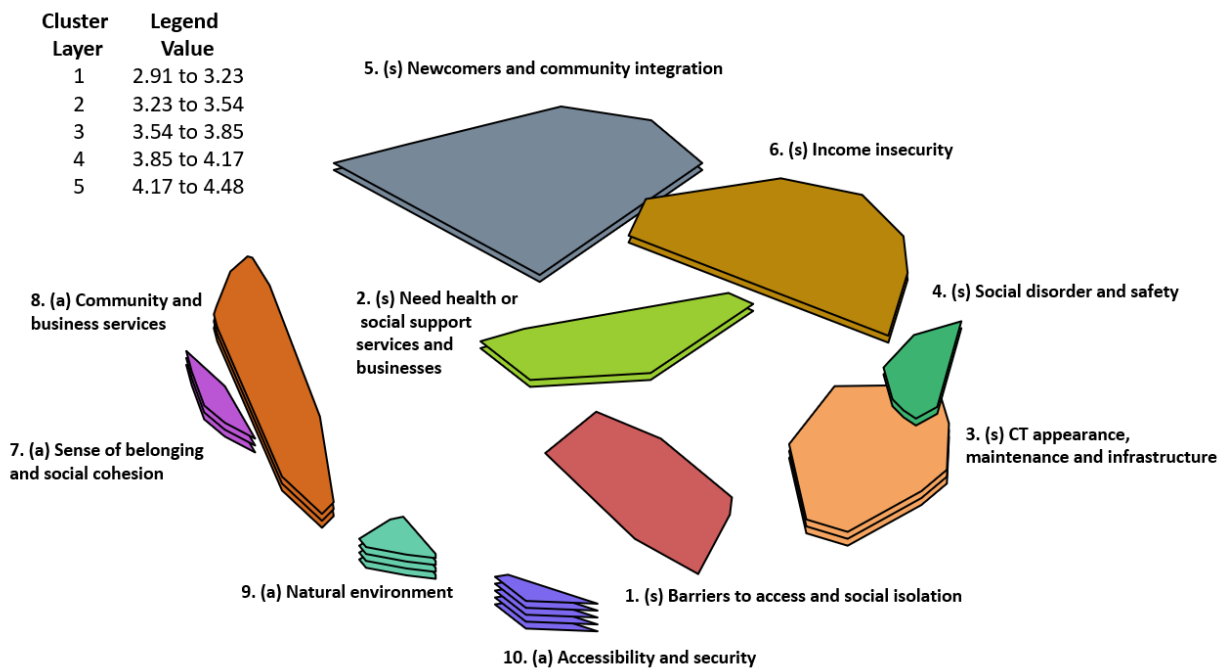


Figure 3.3. Cluster Rating Map of Neighbourhood Chronic Stressors and Assets Prior to Participants' Interpretation of Results.

Table 3.1

*Importance Rating of Ten Clusters*

<b>Cluster</b>	<b>Chronic Stressors</b>	<b>Cluster Rating of Importance</b>
1	Barriers to access and social isolation	2.91
2	Need health or social support services or businesses	3.30
3	Crescent Town appearance, maintenance and infrastructure	3.60
4	Social disorder and safety	3.51
5	Newcomers and community integration	3.31
6	Areas in Need of City Support	3.27
<b>Cluster</b>	<b>Assets</b>	<b>Cluster Rating of Importance</b>
7	Available Support System	3.67
8	Community and business services	3.78
9	Natural environment	4.16
10	Accessibility and security	4.48

As illustrated in Figure 3.3 and Table 3.1, the cluster of chronic stressors with the highest importance rating was Crescent Town Appearance, Maintenance, and Infrastructure. The cluster of assets with the highest importance rating was Accessibility and Security.

In creating the cluster map, the anchoring or bridging values of each statement and cluster are also generated to depict whether each cluster or statement acts as an anchor or bridge as described earlier in the procedures (see Table 3.2).

Table 3.2

*Bridging Values of Ten Clusters*

<b>Cluster</b>	<b>Chronic Stressors</b>	<b>Bridging Value</b>
1	Barriers to access and social isolation	0.64
2	Need health or social support services or businesses	0.51
3	Crescent Town appearance, maintenance and infrastructure	0.27
4	Social disorder and safety	0.38
5	Newcomers and community integration	0.33
6	Areas in Need of City Support	0.45
<b>Cluster</b>	<b>Assets</b>	<b>Bridging Value</b>
7	Available Support System	0.20
8	Community and business services	0.19
9	Natural environment	0.15
10	Accessibility and security	0.08

A lower value indicates the statement is acting as an anchor and a higher value indicating the statement is acting as a bridge (Kane & Trochim, 2007; Nadeem, Stoyanov, & Koper, 2011). These values help to interpret how similar the statements are within a cluster for further interpretation.

Within the second workshop, participants interpreted these resulting maps, strategized asset-based solutions and discussed how these results can be further used. In the stage of interpretation, participants were provided with the opportunity to critique the cluster labelling and grouping of statements to indicate what changes could be made to better improve the maps' representation of their views. Through their interpretation,

changes made to the cluster map, including changes to the cluster labelling and regrouping of statements were noted (see Appendix G). The software also provides the option to regroup statements into neighbouring clusters and as such, clusters may overlap as a result of the regrouping. It was decided to regroup statements from two clusters as suggested by participants. Statements 69, 79, and 101 from Cluster 4 were regrouped to Cluster 3 to better match its cluster label. Statement 101 from Cluster 4 was regrouped to Cluster 6.

### **Clusters of Neighbourhood Chronic Stressors**

The following results of the ten clusters were first prescribed by the algorithm of the concept mapping software based on participants' labelling of their own piles and then edited by my thesis advisor and I to better reflect the statements within each cluster. Again, participants were then presented with the following cluster labels and provided feedback to edit the cluster labels if needed.

Cluster 1 was labelled as "Barriers to Access and Social Isolation" to represent the two main highlighted issues. Some statements were related to physical barriers to accessing resources and services for various reasons, such as needing to commute a far distance and dealing with a lack of services nearby the neighbourhood. For example, one statement indicated "physical barriers in condo complex" exist. Other statements were related to problems in the neighbourhood that could lead to feeling socially isolated, such as a lack of activities for older adults as indicated by one statement, "mom is in retirement and there are no events/activities for her". Further, these two groups of statements can also be interrelated, as if one resident finds physical barriers within their condo of

residence, it may reduce their opportunities to have social interactions outside of their home unit.

Cluster 2 was labelled as “Need for Health and Social Support Services and Businesses” to represent the problems as a result of a lack of services and businesses nearby, as such there is a need for these services and businesses. This cluster consisted of some statements suggesting that nearby support services for physical and mental health, and affordable businesses are needed. For example, “expensive to take cab to nearest clinic.” Other statements indicated a lack of social support is available, such as some statements that point specifically to a lack of a tenants’ association, lack in clarity of resources, and people not caring about their surroundings.

Cluster 3 was labelled as “Crescent Town Appearance, Maintenance and Infrastructure”. Almost half of the statements referred to problems with the high-rise buildings’ cleanliness, maintenance and aging infrastructure. Some statements described needing pest control, experiencing broken or overcrowding elevators and the overall infrastructure breaking down. For example, one statement referred to “spread of pests – fear of contact with bedbugs”. Some statements highlighted the problems with the neighbourhood’s image, cleanliness and maintenance. As examples, some statements specifically described empty business locations, overall cleanliness around Crescent Town, and a loose tile on the walkway that needs maintenance as related stressors.

Cluster 4 was labelled as “Social Disorder and Safety” to represent some statements that were indicating a lack of order or control of the neighbourhood that is leading to disorganization and concerns of safety. Some statements suggesting social disorder include

garbage around the neighbourhood, overcrowding, and doors slamming shut. Some statements suggesting safety concerns include feeling unsafe because of the aging infrastructure and a lack of proper emergency devices.

Cluster 5 was labelled as “Newcomers and Community Integration” to represent problems that new immigrants who are neighbourhood residents face as well as concerns that others have regarding newcomers in the neighbourhood. For example, one statement suggested “new immigrants come with a very specific set of issues (settling down to new culture, employment, housing, language barrier)”. However, there were also indications that a higher proportion of new immigrants residing in Crescent Town is a source of chronic stress as one example states, “continuous flow of new immigrants”. Some of the statements suggested the existence of ethnic conflict within the community, as well as racism and discrimination against newcomers. Some statements were less specific about who the racism targeted but that it existed. Lastly, this cluster also consisted of statements related to lack of community integration between groups other than newcomers and other residents, but also between age, cultural, and ethnic groups. As an example, one statement detailed, “cultural gap between youth and adults”.

Cluster 6 was labelled as “Income Insecurity” to represent problems highlighted that referred or may be indirectly related to financial concerns. Some statements specifically pointed to unemployment, childcare expenses, cost of living, such as one statement explaining a need to “increase hourly pay to fulfill basic needs”. However, some other statements highlighted high crime and feeling a bit isolated living here, which were

inferred to be a result or related to income insecurity and the reasoning behind how participants sorted these statements.

### **Interpretation of Neighbourhood Chronic Stressors**

Participants independently reviewed the list of clusters of chronic stressors and the statements within each cluster. Following, they discussed with the larger group whether these clusters accurately depicted the neighbourhood chronic stressors and what modifications can improve the cluster map's representation. Below is what was drawn from the discussion.

In discussing Cluster 2, it was highlighted that few spaces within the Crescent Town marketplace are currently occupied as is noted within a few of the stressor-related statements, including statements 20 and 203 and also related to statements 1, 3, 42, and 144. It was suggested within the discussion that a lack of businesses within the marketplace may reduce opportunities for social interactions between neighbourhood users and create a deserted atmosphere.

In many instances of the discussion, a need for a tenants' association was mentioned within the statements of stressors (statements 21, 36, 53, 54, 201, 202) and as a potential solution for other various statements of stressors. This was particularly suggested when discussing Cluster 3 regarding voicing opinions to property management of the high-rise apartments and condos within Crescent Town. Further, this solution is also an indicator of the interest in using collective power for the benefit of the neighbourhood.

It is also important to note that participants discussed gaps that were not represented in the cluster map. It was suggested by one participant that lack of supports for accessing opportunities for education is not represented within Cluster 2, Need for Health and Social Support Services and Businesses. This was not brainstormed and thereby, could not be sorted into this cluster.

Participants suggested modifications to improve the cluster map's representation. In discussing Cluster 1, some participants voiced that the two types of chronic stressors, physical and social barriers should be separated into individual clusters. One participant suggested that they appear to be distinct types of chronic stressors and should then be separated. However, it may be that the participants who sorted these statements found these two barriers to be interrelated, such that these are physical barriers to access and opportunities for social interactions. As these physical and social barriers are not sorted in distinct areas of the cluster, they cannot be regrouped into two distinct clusters. More specifically, some participants suggested that Cluster 3's statements 26, 55, 56, 93, and 120, Cluster 4's statement 122, and Cluster 6's statement 27 should be regrouped into Cluster 1.

Some participants shared that Cluster 6's previous label, Income Insecurity did not adequately represent all of its statements. Some of these statements did directly refer to financial concerns, such as "low income or no jobs" or "cost of rent is too high". Whereas it was inferred for other statements that it could be related to income insecurity, such as "feel a bit isolated living here" which may be why some participants sorted these kinds of statements in the same cluster. Alternatively, one participant expressed that with the amount of statements referring to income insecurity, other statements may be regrouped,



and income insecurity can continue to remain as one cluster. However, after discussing with participants, one participant proposed a different label, such as “City Supports” which may better represent the cluster. Thus, the label was reframed to “Areas in Need of City Support”.

### **Clusters of Neighbourhood Assets**

Cluster 7 was labelled as “Sense of Belonging and Social Cohesion” to represent that members and groups of this community are creating a sense of belonging for these participants. Further, this cluster indicates that these participants are feeling a sense of social cohesion, as some statements highlighted a “tight-knit community” and that “community fairs and festivals help people from various backgrounds come together”.

Cluster 8 was labelled as “Community and Business Services” to represent assets including the community centre or commercial service. Some statements indicated that these community or commercial services are conveniently within walking distance, such as one example, “walking distance to [a community health centre], another community centre with great programs”. Some statements highlighted specific assets within community centres, such as the gym facility within Crescent Town club, while other statements indicated the variety of community or commercial services is a neighbourhood asset.

Cluster 9 was labelled as “Natural Environment” to represent assets of the nearby surroundings, including parks and trails. Some statements specifically indicated they are nearby, calming, and provide the opportunity for physical or social activities. For example, one listed asset was “close to two parks (opportunities for praying, fresh air, physical

activity)”. There are also a few statements that may not be captured by this label that reference the “improved housing condition”, accessibility of walkways, and rent control.

Cluster 10 was labelled as “Accessibility and Security” to represent how accessible the neighbourhood is for users to travel within and outside of the neighbourhood and the statements that highlight the sense of security and safety in the neighbourhood. One statement highlighted the “enhanced security from the bridge leading to the subway, especially for kids” as an asset. Other statements suggest the nearby public transit and the low crime rate of the area as assets.

### **Interpretation of Neighbourhood Assets**

Following the interpretation of the neighbourhood chronic stressors, the participants independently reviewed the clusters and statements within each cluster for the neighbourhood assets. Participants then discussed with the larger group, how representative each cluster is of its statements and how the cluster map can improve its reflection of the participants’ views.

One participant suggested modifying Cluster 7’s label, as they explained that their first impression of Cluster 7’s labelling suggests that all community members have a sense of belonging. Though this is not the intention of the labelling, it suggests that this cluster label can be misleading. This participant also suggested to rename this cluster as a support system or supports available. This cluster was reframed as an Available Support System to represent the assets that provide social support for opportunities for social interactions.

In discussing Cluster 7, it was highlighted by one participant that one statement from Cluster 8 could be placed in Cluster 7. As Cluster 7 represents Available Support System, statement 168, “community events” can also be moved from Cluster 8, “Community and Business Services”.

### **Strategizing to Reduce or Improve Neighbourhood Chronic Stressors**

At this stage, I presented the cluster rating map to participants showing the rating of each cluster of neighbourhood chronic stressors and neighbourhood assets. It was then explained which clusters were more highly rated than others and that for the next exercise, 1-2-4-All, the participants will be focused on the most highly rated cluster, “by focusing on Cluster 3, “Crescent Town Appearance, Maintenance and Infrastructure”. However, it was emphasized to participants that despite this cluster being the most highly rated by participants, it does not suggest other clusters and statements are less important; rather, that this reflects how this group of participants sorted and rated these chronic stressors. These clusters and statements are all significant results and may be considered highly important to some of the participants and other neighbourhood users. For this workshop, only one cluster was focused on for the sake of time and feasibility. Through the first run of the exercise, two distinct chronic stressors from Cluster 3, increasing rent and building maintenance and accessibility were targeted for the group to focus on in the next exercise.

Through the discussion with participants, chronic stress as a result of increasing rent was attributed to two factors, including income insecurity and not securing a job that one perceived to be suitable for their skillset. More specifically, participants discussed that many Canadian newcomers experience the challenge of only securing jobs for which they

are underqualified. Alongside increasing rent, participants also discussed the increasing employment expenses, such as the cost of using transit that are making it difficult for their current salary to meet their income needs.

Building maintenance was discussed as a chronic stressor in response to ongoing problems within units, hallways and elevators, including needed repairs and pest control. It was shared that building management was lacking in responsiveness resulting in frustration from those who are tenants. Accessibility was also highlighted as a chronic stressor as some buildings within Crescent Town have not been able to accommodate wheelchair accessibility needs. Further, there were some participants who shared that management had concerns with multiple residents with wheelchair needs living in the same unit.

Once two neighbourhood chronic stressors were chosen and the causes of stress as a result of these stressors were explored, participants were asked to complete the “1-2-4-All” exercise again by focusing on the neighbourhood assets within the cluster rating map to strategize asset-based solutions for the previously discussed chronic stressors. Participants considered what assets can be improved or built upon each other or what assets have not been brainstormed but may be useful for the chronic stressors of increasing rent and building maintenance and accessibility.

After each group shared their discussion, it was found that establishing a Residents’ Association was a popular strategy. It was highlighted that its function can be beneficial for advocating on behalf of tenants and owners for collective action towards the chronic stressors of building maintenance and accessibility. Some participants also suggested there

are opportunities for a Residents' Association to meet within available meeting rooms in the Crescent Town Club or neighbouring community centres and public libraries. One participant also highlighted this may be an opportunity to bridge the gap between tenants of condos and apartment buildings as there are collective issues that both groups face but there are not currently opportunities for both groups to meet. It was also shared by one participant that a similar association, a Services Council currently exists that allows residents from the neighbourhood and service providers to discuss how to match needs within the community. However, this collective association is more focused on service providers and less beneficial for communicating with building management.

In response to the chronic stressor of increasing rent and related employment expenses, some participants proposed that implementing a community fair to introduce the available supports and resources within the neighbourhood can alleviate this chronic stressor. It was discussed that between the different resources within the neighbourhood, there is some confusion as to which association offers which support service. This confusion was also indicated in some of the brainstormed statements. Thus, the collective discussion acknowledged that there are significant support services and resources available within the neighbourhood, but the promotion and clarity of the services can be improved. One participant also highlighted that job opportunities are more often a result of a built social network which consequently, led to the proposal of a community fair. This was proposed as a network opportunity for newcomers and current residents with community members to build their social networks and be supported in securing a job suitable for their skills.

### **3.2 Observations of the Utility of Concept Mapping**

Concept mapping required a total of eight hours of participants' time and active participation of each willing participant for all stages of concept mapping excluding representation, in which I used the concept mapping software to visually represent the collected data. Through an initial PowerPoint presentation, participants learned of the study's purpose and key terms, including neighbourhood chronic stressors and assets to provide this relevant information. The process of using two focal prompts for the stage of generation led to 233 statements, comprising of 152 statements of chronic stressors and 81 assets. This evidently suggests that participating members understand and can identify chronic stressors related to and within their neighbourhood.

Though participants were able to review and provide further feedback to the maps to better represent their views in the interpretation stage, we were unable to move some statements that were identified as a better fit in different clusters. As the software does not permit the movement of a statement from one point to another area, it could only be noted in their feedback, which is presented in Appendix G. Participants also suggested re-clustering of some statements that were not grouped together. However, the software's clustering is based on participants' grouping data and as such cannot be manipulated this way without changing the clustering of other groups of statements. Thus, there are some limitations but all of participants' feedback is depicted in Appendix G.

Participants were further asked to use the resulting visual maps of their self-generated list to identify potential strategies for chronic stressors within the cluster with the highest importance rating, Crescent Town Appearance, Maintenance, and

Infrastructure. The two chronic stressors chosen by participants were the increasing rent and building maintenance. The identified strategies were built upon existing assets that were represented through concept mapping or were missing from the resulting maps. For example, the community fair was strategized to highlight existing neighbourhood resources, and not to create further services. However, the strategy of a Residents Association targets a lack of representation for both tenants and owners and a lack of communication between the two groups of residents. Thus, the usage of concept mapping paired with a structured exercise facilitated the process to identify some potential solutions to explore.

In addition, using concept mapping allowed participants to consider each others' perspectives when strategizing solutions. For example, the strategy of a community fair was in part in consideration of newcomers' challenge to securing employment that meets their skillset. However, not all participants were newcomers and one participant who discussed this challenge was observed to be speaking through their experience with newcomers in their employment. As such, concept mapping facilitated the opportunity to consider challenges unique to different subgroups of the community, such as newcomers.

Further, the use of concept mapping also engaged some participants to use their own pre-existing insight to identify and discuss strategies. For example, one participant highlighted that a Neighbourhood Services Council already exists which could alleviate the issue of a lack of representation for residents. However, through further discussion with other participants voicing their experience, it was concluded that this council focuses on service providers and thus, a need for a Residents' Association still exists for concerns of

the residential complex. Thus, concept mapping engaged participants to consider different perspectives and discuss their personal knowledge and experience to explore potential solutions.

During the review of the resulting map illustrating neighbourhood chronic stressors and assets, I observed that not all participants had provided input. Only a handful of participants had contributed to the open discussion while others were actively listening. However, during the structured exercise, 1-2-4-All, every participant was observed to be contributing to their own group's discussion in pairs and following, in groups of four.

### **3.3 CAB's Perspective on the Findings of the Twitter Analysis**

The CAB was met with asynchronously and during the last meeting asked to discuss whether they had expected their neighbourhood to be identified as one that is expressing high chronic stress relative to other Toronto neighbourhoods. At this meeting, the findings of concept mapping were also shared with them. The CAB was comprised of two neighbourhood members who were employees and one neighbourhood member who was a resident. The first employee shared that as an employee, they did not feel that they could truly pinpoint that this was an area that they found of high chronic stress because they lacked the same sense of familiarity that a resident would have of this area. However, with their exposure in their place of employment, they do experience neighbourhood members entering with stress, but it is likely to be attributed to the nature of their employment.

The second employee who did not attend concept mapping shared that through their experience as an employee, they had either direct experience with the chronic stressors that were experienced and shared by participants or they had learned of the



chronic stressors through their employment. As such, the finding of Crescent Town being one of Toronto's high chronic stress neighbourhoods was not completely unanticipated.

The third CAB member, a resident had considered whether the Twitter results were a fair representation as not everyone is on Twitter and particularly those of older age are likely not on Twitter as much. Thus, they were considering whether Twitter results were accurately representing all neighbourhood members. However, they had stated that the Crescent Town community is full of community members who want to address the encountered challenges, a strong positive aspect of this community.

## **Chapter Four: Discussion**

### **4.1 Crescent Town as a Community Within a Neighbourhood**

Through Phase 1's results of triangulation of the emotion analysis of Twitter Tweets and administrative data, Crescent Town was selected amongst a group of neighbourhoods indicating high chronic stress and low resilience. It was anticipated that communities may exist within or across the neighbourhoods that may be identified. These neighbourhood boundaries were set by the city of Toronto. Thus, Phase 1's analysis of Tweets first identified spatial clusters of stress and following, overlaid these clusters with the city's neighbourhood boundaries. This was to ensure that communities existing between neighbourhood boundaries would be captured by the emotion analysis however, to triangulate with administrative data, neighbourhood boundaries were overlaid.

It was identified through literature that this neighbourhood is home to two separate communities, Crescent Town and Secord and these communities were jointly identified as one of 13 priority neighbourhoods by the city of Toronto as Taylor-Massey (Strong Neighbourhoods Task Force, 2005). As such, Crescent Town is its own distinct community within this neighbourhood, and in contrast to Secord, community members there face distinct experiences, including challenges of "long term poverty, education, and employment" (Boston & Meagher, 2007, p. 6).

In addition, this study's recruitment flyer had included "Crescent Town" in its title, which may have led to the disinterest of Secord community members and led to solely Crescent Town members participating in concept mapping to identify distinct chronic stressors and assets related to Crescent Town community. Thus, it is likely that the results

of Phase 2, namely the stressors and assets identified are representative of the community and less likely representative of the entire neighbourhood.

This also suggests that studies using solely administrative data such as Wellbeing Toronto and Urban HEART @Toronto may not target the needs of the specific communities. Thus, the analysis of tweets may provide a more accurate depiction of the chronic stress of areas and the engagement with the community through concept mapping highlights the strengths and challenges unique to their community.

#### **4.2 Identified Chronic Stressors and Assets**

The first research question of this study was to explore what participants identified as existing neighbourhood chronic stressors. Using a strengths-based approach to guide this methodology, participants were instructed to generate both neighbourhood stressors and assets so that the visual representation showcases the challenges but also unique strengths the community can build upon for solutions. These resulting maps indicate the community's distinct problems and gaps but also the strengths the community has to strategize with, as well as some tensions between the two groups of clusters.

It should be noted that this is a novel way of using concept mapping as the methodology of concept mapping typically only employs one focal prompt. As a result, participants brainstormed a significantly high number of unique statements that would make it difficult to sort both groups (i.e., stressors and assets) within the allotted time of the session. To improvise, participants were randomly assigned to sort and rate the statements of chronic stressors or assets. Following, the completed data of each pair of participants was submitted as one participant into the concept mapping software. Thus,

further analyses of the results such as, pattern matching and go-zone displays, which consider how different subgroups of the participants sorted and rated the data (Trochim & Kane, 2005) were not completed as each participant in the software represented two participants' paired data. As such, the results may be misrepresenting participants data as one participant may not similarly rate or sort the data as another participant.

**Clusters of chronic stressors.** Study findings support some areas of Shankardass's (2012) conceptual framework. The three types of determinants, including natural, built, and social environmental determinants described by Shankardass, 2012 were identified within the clusters of chronic stressors. As can be seen in these clusters and discussed by Shankardass (2012), it is not atypical for chronic stressors to overlap into different categories of environmental determinants.

The natural environmental determinants, those naturally occurring (Shankardass, 2012) can be identified within Cluster 3 (Crescent Town Appearance, Maintenance, and Infrastructure) and Cluster 5 (Newcomers and Community Integration) as weather conditions. In Cluster 3, two chronic stressors described how weather conditions affect living and commuting within the neighbourhood. For example, one chronic stressor detailed, "problems that arise in relation to weather: flooding, snow, power outage". In Cluster 5, two chronic stressors described how weather conditions affect newcomers' adaptation. For example, one chronic stressor involved, "climate change from back home to Canada". Cluster 3 and 5's corresponding bridging values are 0.27 and 0.33. This relatively low value suggests that these clusters are acting as anchors, as they are located on the map

as a result of how it was sorted in close proximity to other statements (Kane & Trochim, 2007).

The built environmental determinants, which are meant for human activity (Shankardass, 2012) can be seen in Cluster 1 (Barriers to Access and Social Isolation) and Cluster 3 (Crescent Town Appearance, Maintenance and Infrastructure). These determinants highlight the physical barriers that can lead to social isolation or lack of access (Cluster 1) and the needed repairs and maintenance of the residential buildings and the rest of the neighbourhood (Cluster 3). Their respective bridging values were 0.64 and 0.33. Cluster 1's bridging value was seen as the highest of all clusters, suggesting that it acts as a bridge between other clusters and it is located on this map as a result of resolving the distance between statements (Kane & Trochim, 2007). During the interpretation session, it was discussed that Cluster 1 contained two types of barriers, physical and social, and that statements from other clusters could fall under Cluster 1. This suggests that this is a cluster that cannot be understood distinctly, but rather in connection with the rest of the cluster map.

Lastly, the social environmental determinants, the sociocultural factors (Shankardass, 2012) can be seen in all of the clusters of chronic stressors, except for Cluster 3 which primarily highlights natural and built environmental determinants. With the exception of Cluster 3 being the lowest bridging value, we will discuss the cluster of chronic stress with the next lowest bridging value to highlight some of these sociocultural factors. The cluster with the next lowest bridging value was Cluster 5 (Newcomers and Community Integration) with a corresponding bridging value of 0.33. Cluster 5 highlights

several areas of tension between groups, including newcomers and residents who have stayed in the community for longer periods, younger and older adults, and a concentration of the South Asian community. These groups have distinct challenges that they face but there is also a need to integrate and bridge the gap between these groups as well. For example, this cluster highlights distinct challenges that newcomers face in trying to settle within a new environment, including language barriers, and obtaining employment and housing. In comparison, residents who have stayed for longer periods expressed that a lack of diversity is a challenge as well. This further indicates that opportunities for the community and different groups to engage with each other could alleviate the lack of community integration seen in the cluster map.

Some of the generated statements were also suggestive of neighbourhood disorder, such that they perceive missing order and social control in the community (Ross & Jang, 2000). Particularly in line with neighbourhood disorder is Cluster 4, Social Disorder and Safety, though statements within other clusters could also be signs of physical and social disorder. For example, some statements in other clusters were related to the community's reputation of crime, criminal acts seen in the community, homelessness, abandoned storefronts, and garbage littered around residential areas. As community members identified these challenges as contributing to chronic stress, it supports the need to target these concerns that can be associated with worse health (Ross & Mirowsky, 2001).

**Clusters of assets.** Participants identified four clusters of neighbourhood assets, which are valuable resources that can be used to overcome stressors (Berkowitz & Wadud, 2018; Norris et al., 2008). Similarly using Shankardass's (2012) conceptual framework,

these assets can be framed as environmental determinants that can influence coping with chronic stress. Natural environmental determinants can be found in Cluster 9 (Natural Environment) with a bridging value of 0.15, suggesting that this cluster is cohesive and a result of the sorting of its statements close together. The cluster highlights that the natural surroundings, including the calm and quiet atmosphere and the availability of the parks and trails are valuable and contribute to the quality of life for the community.

Built environmental determinants can be found in Cluster 8 (Community and Business Services) and Cluster 10 (Accessibility and Security) with corresponding low bridging values of 0.19 and 0.08. Cluster 8 highlights the value in the nearby community centres, and businesses and services that provide social service programs for different groups, facilities for exercise, affordable groceries, services for health needs, and more. Cluster 10 highlights the value of a safe environment and proximate, convenient, and accessible access to the public transit.

Social environmental determinants were found in Cluster 7 (Available Support System, formerly Sense of Belonging and Social Cohesion) with a low bridging value of 0.20. The assets grouped under this cluster generally focus on the friendliness of the community and having multiculturalism values. Some of these assets are conflicting with the chronic stressors that were also identified, which indicates that some disagreement exists between participants that are likely to occur in a group of participants with a range of perspectives. For example, some assets pointed to the community's friendliness whereas some stressors discussed the community appears disinterested in interacting with those outside of their

in-group. This is further indicative of a need to continue exploring where these discrepancies can be resolved.

This study also intended for participants to use concept mapping to plan for community resilience as a process to overcome the neighbourhood chronic stressors and adapt to the changes in the environment (Norris et al., 2008). With 81 assets identified by participants, it was made clear that many available resources exist within the community that can be mobilized or built upon to address the noted challenges. It is important to note that having participants identify these assets can also clarify what resources are also missing in the community. Participants demonstrated the community capacity to capitalize upon these available assets through the exercise, 1-2-4-All.

#### **4.3 Identified Asset-Based Solutions**

Participants used the resulting maps that were participant-generated to identify two asset-based solutions through the structured exercise, 1-2-4-All. This exercise facilitated the process for participants to build upon each other's ideas. Following Fawcett et al.'s (1995) model of empowerment, the participants collaboratively planned asset-based solutions with the involvement of a diverse range of backgrounds as a beginning step. The two main asset-based solutions identified were to establish a Residents' Association to have a structured mechanism to deal with concerns of building maintenance and accessibility and a community fair to promote the nearby support services and to network for employment opportunities. Using concept mapping and a structured exercise, participants were empowered to begin strategizing how to improve these chronic stressors.



Further, this study's intention to engage and empower community members also cultivated a relationship between the researchers and the community members who have contributed to this study. One community member had further invited all community members and the study's researchers to an upcoming meeting held by the City of Toronto's Community Development Officer as a part of the TSNS 2020 to discuss the study's findings. As previously discussed, the end of this thesis study does not ultimately lead to an end for the collaborative and empowering process for community members. Instead, this is the beginning of an opportunity to use this study's findings to inform future collaborations between researchers, the community, and the city.

#### **4.4 Concept Mapping as a Tool to Engage Community Members**

This study's overall purpose was to pilot a method to engage community members to identify chronic stressors and empower community members to strategize asset-based solutions. As a tool, conducting concept mapping did elicit a wide range of chronic stressors and assets that can be used to begin strategizing how to reduce chronic stress through the ten-cluster solution. When comparing the concept mapping findings to the identified themes of a previous study conducted through focus groups and interviews in Crescent Town (Boston & Meagher, 2007), there are similar results regarding the physical infrastructure, individual and family issues, and community development in trying to improve social cohesion. Thus, this suggests that concept mapping can garner the kinds of concerns that other methods have previously been used to do so.

Some further benefits of using concept mapping was the power-sharing process as participants' rating of statements led to a prioritization of clusters to strategize asset-based

solutions. This is not to suggest that other clusters were not also significant to address, rather we can prioritize the most important cluster for the purposes of the exercise as indicated through participants' rating data. However, this ultimately does silence some of the softer voices and their concerns in doing such a structured exercise. For example, though an item such as, "choosing a school for students to attend after Crescent Town" was not highly rated as important by the majority of the group, it is still an important issue for some Crescent Town parents. As seen through the discussed news articles, the elementary schools do experience challenges of lacking resources and being overcrowded (Chiose et al., 2014; Lameira, 2013). Thus, using concept mapping does appear to minimize less popular opinion.

In addition, using concept mapping was an empowering process as participants were involved in data collection, interpretation, and utilization. Participants independently generated, sorted, and rated statements, which can counteract dominating or unengaged participants, which are some limitations of focus groups (Minh et al., 2015). Participants also had the opportunity to shape the results in the interpretation stage and discuss how to use the results next. In contrast to other research methods, such as interviews and focus groups, participants typically end their involvement after data collection. The researchers for these traditional methods would then interpret and conclude the study's findings and may use methods, such as member-checking to ensure the validity of the results. However, participants are not typically highly involved in shaping the findings.

The interpretation stage also facilitated the opportunity for participants to explain the brainstormed statements. Though the statements garnered were concise to ensure that

statements only represented one clear idea, some of the statements required further elaboration for participants who did not provide those ideas to correctly understand them to sort and rate them. In comparison to focus groups and interviews, unclear ideas within concept mapping were clarified in cases where the ideas were unclear.

Overall, concept mapping required active engagement of participants for an extensive time as participants are involved for approximately eight hours, which is a significantly lengthier time than the use of focus groups or interviews would require from participants. The methodology was also significantly costly as funds are needed for participants' compensation, the concept mapping software, meeting room bookings, and supplies. Thus, the piloted methodology can be an effective way to garner a range of perspectives, but future studies should consider the feasibility of using concept mapping regarding time and cost.

#### **4.5 Knowledge Transfer and Mobilization**

EMOTIVE, the emotion mapping tool is currently part of a larger research project, *Stresscapes* that is studying environmental stress through social media (Sykora et al., 2015). This study piloted a novel approach to coupling the power of big data, specifically social media with community engagement to make a collective impact and to take a proactive approach to adapting to stress through resilience. As such, findings of this project can be presented in academic conferences alongside the work of *Stresscapes* to other researchers and academic journals. This will allow the findings of this research as well as its limitations to be shared with other researchers from fields of planning, geography, community psychology, public health, and more because of the different fields applicable.

The study's findings will also be submitted to academic journals of different fields for future considerations.

As per the study's overall framework, empowerment and community resilience are processes that we and the community can continue working towards to build the capacity for them to adapt to and strategize for the identified neighbourhood chronic stressors. As discussed previously, the end of this thesis study is not intended to be an end for our engagement with the community nor the efforts of the community to impact change. Part of the plan for knowledge exchange is to present this study and its findings in an executive summary to be shared with community members (see Appendix H), service providers, and City of Toronto teams working on neighbourhood change, including the planning team of the TSNS 2020.

As these findings are the result of community knowledge, we also anticipate as part of the knowledge mobilization plan to meet with community members to discuss how these findings can be used to impact the challenges they have shared in concept mapping. As conducting research with communities also necessitates communities should have control over how findings are disseminated (Nelson & Prilleltensky, 2004), we will be meeting first with community members to discuss next steps in sharing these findings.

If agreed upon, we anticipate meeting with the planning team of the TSNS 2020 to share the executive summary and particularly the extensive list of neighbourhood chronic stressors and assets that were generated by participants. This list can reinforce the current plans of the TSNS 2020 or it could identify the areas that have been overlooked but should be addressed. We also anticipate meeting with the city councillor and their team that may

also be interested in how this study's findings can inform current policies and highlight the challenges in which the TSNS 2020 may not have plans to do so yet.

#### **4.5 Limitations**

Some limitations are to be considered with Phase 1's emotion analysis of Tweets. One limitation is whether EMOTIVE effectively analyzes emotions of Tweets if these online self presentations are unrepresentative or inauthentic. For example, Rui and Stefanone (2013) discovered the behaviour and motivations of online self presentation can vary depending on cultural differences and online audience characteristics. For these limitations, we assume that the online Twitter accounts are Tweeting in congruence with how the Twitter user feels. In following the pragmatic approach, if we found discrepancies between the online Twitter community's expression of stress and the identified geographic community, it does not suggest that one is a false representation (Johnson & Onwuegbuzie, 2004), rather that there are different perspectives collected.

Secondly, the small sample size and diversity of participants may have affected the generalizability of the results to the rest of the neighbourhood. This study aimed to recruit five participants to establish a CAB but only three were recruited without a balanced number of residents and employees, as two of them were employees and one of them was a resident. This study also aimed to recruit 22 participants to take part in all concept mapping stages and though we recruited more participants to anticipate participant attrition from using two sessions, not all participants took part in the rating and sorting stages. Though we did aim to recruit a balanced number of residents and employees for concept mapping, a high proportion of residents were recruited.

Thirdly, this study encountered numerous challenges as expected when piloting a methodology. As previously mentioned, as a result of using two focal prompts, there were more than the average amount of brainstormed statements generated and as a result, participants were paired up through the software for their rating and sorting data. Thus, we cannot conduct further analyses to understand how different groups of participants may rate the importance of the brainstormed statements and clusters.

Lastly, as previously discussed, the brainstorming stage is intended to garner concise responses to the focal prompts but with some participants potentially misinterpreting some statements it could result in sorting or rating differently. For future studies, researchers may consider coupling both concept mapping and focus groups. As illustrated in Guichard et al.'s (2017) study, focus groups and concept mapping were used to investigate the factors that needed to be considered to implement an effective health equity tool in Quebec. By reducing participants' responses into single sentences in concept mapping without further elaboration, it reduced participants' satisfaction of the process. Thus, they also conducted focus groups to supplement concept mapping's limitations by offering the opportunity to share their reasoning behind opinions and resolve these conflicting views. Guichard et al.'s (2017) implementation of both methods demonstrated a mixed methods approach can be beneficial in overcoming each method's limitations. However, this study also ensured the opportunity to discuss statements for clarification was provided during the interpretation stage. In addition, as previously discussed, participants were involved for an extensive time and thus, coupling multiple methods would increase the burden for participants' engagement.

Future studies may consider including the use of focus groups to triangulate the findings of both methods and provide ample space for communities to discuss their experiences, challenges, and perspectives on building community resilience while reducing chronic emotional stressors. However, it should also be considered whether this would be an effective use for the study's purpose and feasible to do so for cost and time purposes.

#### **4.6 Conclusion**

This thesis study piloted a mixed-methods research design that aims to create actionable change by engaging community members to identify chronic stressors and empowering them to strategize asset-based solutions to build community resilience. This is likely the first study to pilot the coupling of an emotion analysis of Twitter Tweets and community engagement methods to target neighbourhood chronic stress. This study identified Crescent Town, also known as Taylor-Massey, as one of the Toronto neighbourhoods experiencing high chronic stress and low resilience. Following, 23 participants were recruited to take part in concept mapping, a power-sharing methodology to identify neighbourhood chronic stressors and assets. A ten-cluster solution was generated, with six clusters of chronic stressors and four clusters of assets. Using this cluster solution, participants collectively strategized two asset-based solutions, including a Residents' Association and a community fair. It is anticipated that the study's findings can be mobilized to address these neighbourhood chronic stressors by the community and with city partners and community organizations.

# SEEKING 5 RESEARCH PARTICIPANTS IN CRESCENT TOWN

If you are 18+, live and/or work in the Crescent Town neighbourhood, and want to help improve your neighbourhood, join our study about improving resilience in Crescent Town.

This will require approx. 3 hours of your time. A \$40 gift card will be provided at the end of the study.

If you are interested, please complete an online screening survey here:

**<https://tinyurl.com/CrescentTownSurvey>**



Photo courtesy of City of Toronto's 2011 Neighbourhood Demographic Estimates.

This research is conducted by Martha Ta (taxx9300@mylaurier.ca) and Dr. Ketan Shankardass (kshankardass@wlu.ca) from Wilfrid Laurier University.

The project has been reviewed and approved by the Wilfrid Laurier University Research Ethics Board (REB #5852).



## **Appendix B – CAB Consent Form**

WILFRID LAURIER UNIVERSITY

DEPARTMENT OF PSYCHOLOGY

CONSENT FORM – COMMUNITY ADVISORY BOARD

Using Social Media to Engage Toronto Communities for Resiliency and Stress Planning

Principal Investigator: Martha Ta, graduate student

Faculty Supervisor: Dr. Ketan Shankardass, faculty member and researcher

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You are invited to participate in a research study as a member of the community advisory board (CAB). The purpose of the study is to pilot a novel research method to increase community resilience (a community's ability to adapt to challenges) and lower chronic emotional stress through a combination of Twitter Tweets and community engagement. This research is conducted by Martha Ta, a Wilfrid Laurier University Community Psychology graduate student with the supervision of Dr. Ketan Shankardass, an associate professor of Wilfrid Laurier University.

### **INFORMATION**

This study begins with an emotion analysis of public Twitter Tweets that are geo-tagged within the city of Toronto to understand where high rates of chronic emotional stress and low rates of community resilience are found. Following the identification of communities, participant recruitment for a community advisory board (CAB) will occur and interested candidates will complete an online screening survey and answer a series of demographic questions to recruit participants that are representative of all groups. After successful recruitment, a community advisory board (CAB) of five members will be established, in which participants will be recruited so long as they have a demonstrated commitment to neighbourhood improvements through any role capacity. The CAB will provide feedback on the Twitter analysis findings, proposed participant recruitment strategies, methodology (concept mapping) and plans to share the study's findings. It's expected this will require 3 hours (i.e., 3 meetings, each 1 hour in duration) of CAB members' time. The researcher will meet with each individual to accommodate scheduling conflicts. Please note that CAB members must reside and/or work in one of the communities identified by the Twitter analysis, and must be 18+ years of age.

Following, other participants will be recruited within the identified communities to take part in concept mapping sessions. These participants will have a demonstrated link to the community (e.g., as a local resident, employee, student and/or volunteer). Using the concept mapping software, they will aid in strategizing a plan to cope with chronic stress and improve community resilience with their experience with chronic stressors and local assets or resources they have accessed or know of to help with the effects of stressors. They will also provide feedback for the use of the concept mapping tool in planning for stress and resiliency. This will require 8 hours (i.e., 1 full day or 2 half days) of participants' time.

Finally, the community will be provided with a Geolive map website link, in which the community's assets and resources as well as stressors that can be pinpointed will be located. This online map can also be edited by community members.

## **RISKS**

By participating in the CAB, there is a foreseeable emotional risk as participants are expected to discuss the Twitter analysis findings and how these findings, that their Toronto community experiences relatively high chronic stress and low resilience, compare to other Toronto communities. These feelings are normal and should be temporary. If you experience any persistent negative feelings as a result of participating in this study, please contact the researchers and/or a local mental health care facility. To find local resources in Canada, visit <http://www.cmha.ca/mental-health/find-help/>. CAB members are encouraged to respect each other's privacy, but a risk of privacy is a potential risk in group settings. CAB members are only expected to provide information they are willing and comfortable sharing.

## **BENEFITS**

Participants will benefit from the potential for improvement in their community as they take an active role in voicing the needs for supports and resources in their local area. This is also an opportunity to take part in unique community-engaged research that is dependent on participants' feedback. The methods and outcomes of this research are heavily shaped by the community advisory board to avoid unethical procedures.

The larger society will also benefit as this study aims to pilot a method to plan for chronic stress and low resilience within communities. Combining novel technology and community voices, this is an opportunity to consider how effective this study's methods can be used to anticipate the kinds of supports necessary to overcome emotional stress. The results of this study can help plan for future studies and shape the opinions of urban planners, political figures, community psychologists and others in social and health fields.

## **CONFIDENTIALITY**

Please note that the researcher will meet with each member of the CAB individually and will only take written notes. All participants can choose how they would prefer to be identified.

Only the researchers, Martha Ta and Dr. Ketan Shankardass, and the research assistants hired for this study, will have access to the data. All electronic files will be password protected and stored in a secure file or on a USB flash drive. Any identifiable data and/or contact information will be destroyed at the end of the study (i.e., by April 30, 2019). The de-identified data, consent forms, and payment records will be destroyed by the researchers after 7 years (i.e., by April 30, 2026) to respond to any necessary research allegations and to remain in compliance with the Canada Revenue Agency's Income Tax Act."

## **COMPENSATION**

For participating as a member of the community advisory board, you will receive a total of \$40 in the form of a gift card of your preference. At the first two meetings, you will be provided with a \$13 gift card and at the last meeting, you will be provided with a \$14 gift card. If you choose to withdraw from the study, you will still receive the same amount of compensation. Any

compensation received related to the participation in this research study is taxable. It is the participant's responsibility to report the amount received for income tax purposes and Wilfrid Laurier University will not issue a tax receipt for the amount received.

## CONTACT

This project has been reviewed and approved by the Wilfrid Laurier University Research Ethics Board (REB #5852), which is supported by the [Research Support Fund](#). If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Jayne Kalmar, Research Ethics Board Chair, Wilfrid Laurier University, 519-884-0710 ext. 3131, [REBChair@wlu.ca](mailto:REBChair@wlu.ca).

**If you have questions at any time about the study, procedures, or your payment (or you experience adverse effects as a result of participating in this study), please contact the student researcher, Martha Ta, at [taxx9300@mylaurier.ca](mailto:taxx9300@mylaurier.ca), or the supervisor, Dr. Ketan Shankardass at [kshankardass@wlu.ca](mailto:kshankardass@wlu.ca).**

## PARTICIPATION

Your participation in this study is voluntary. If you choose to participate, you may skip any question or procedure or completely withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you choose to withdraw from the study, your data will be destroyed. Your data cannot be withdrawn once data collection is complete because the data will be stored without identifiers.

## FEEDBACK AND PUBLICATION

The results of this study may be shared in journal articles with open access and presentations at academic or community settings. Participants can obtain information about the results of the research by contacting the researcher, Martha Ta, at [taxx9300@mylaurier.ca](mailto:taxx9300@mylaurier.ca). The results will be available by April 30, 2019.

## CONSENT

I have read and understand the above information. I have received a copy of this form. I agree to participate in this study.

Participant's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Investigator's signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix C – Concept Mapping Recruitment Flyer

# SEEKING 22 PARTICIPANTS IN CRESCENT TOWN

**A \$110 gift card will be provided!**

If you are 18+, live and/or work in the Crescent Town neighbourhood, and want to help improve your neighbourhood, join our study about improving resilience in Crescent Town!

This will require approx. 8 hours of your time (two 4-hour days) to participate in a concept mapping session on **April 20th and April 27th, 2019.**

If interested, please complete an online screening survey here:

<https://tinyurl.com/ConceptMappingSurvey>



Photo courtesy of City of Toronto's 2011 Neighbourhood Demographic Estimates.

This research is conducted by Martha Ta (taxx9300@mylaurier.ca) and Dr. Ketan Shankardass (kshankardass@wlu.ca) from Wilfrid Laurier University.

The project has been reviewed and approved by the Wilfrid Laurier University Research Ethics Board (REB #5852).

## **Appendix D – Concept Mapping Research Protocol**

### **Overview**

Concept mapping, a mixed methods research tool, is promoted as a progressive method for creating knowledge through collaborative methods with participants (McLinden, 2017). It is also considered as “a perfect pairing” for the purposes of community-engaged research (Vaughn et al., 2017) because of the high involvement of participants within the methodology. The use of concept mapping will be part of piloting the study’s novel method of combining social media data and community engagement to empower neighbourhood users to strategically plan to reduce, prevent and build resilience against the effects of chronic stress. It will be used in this research study collaboratively with the participants, the neighbourhood users for two purposes. First, it will be used to engage participants to identify what chronic stressors and assets they have experienced within their local neighbourhood environment. Second, the visual maps produced in concept mapping will help empower participants to strategize how to build upon existing assets with resources to reduce chronic stressors.

### **Stressors**

This study focuses on piloting a methodology that can identify neighbourhood chronic stressors and asset-based solutions to improve chronic stress, which is described as a negative emotional state and experience in response to ongoing threats, harms or demands and stressors as “events or thoughts that can cause harm or pose threats or challenges” (Baum, 1990, p. 660). This study particularly focuses on chronic stress, such that it is persisting for extensive periods of time (Baum, 1990). As an example, gun violence occurring in a community over a series of months that an individual perceives to be threatening their safety is classified as a chronic emotional stressor. In relation to the context of a neighbourhood, this study targets chronic place-based stress and chronic environmental stressors and resources. Most simply, chronic place-based stress is stress experienced as a result of an individual’s environmental surroundings, their perception of these surroundings and their socioeconomic position in relation (Shankardass, 2012).

### **Assets**

This study defines neighbourhood assets, also known as community resources and capacities with the Community Tool Box 's definition, "anything that can be used to improve the quality of community life". As such, it can be a person, a physical structure or place, a community service, a business, or anyone in the community (Berkowitz & Wadud, 2018). For example, a neighbourhood asset can be a next-door neighbour, a local volunteer organization or a convenience store. By highlighting neighbourhood assets instead of the needs or deficits, a community plan can build upon existing strengths to improve the neighbourhood and enable neighbourhood users to feel in control of changes (Berkowitz & Wadud, 2018). Similar to this study's theme of conducting concept mapping with participants, community members are involved in creating asset maps, which are geographic maps with pinpointed locations of physical assets that can be shared with city leaders and planners (Sharpe, Greaney, Lee, & Royce, 2000).

## **Participants**

### Community Advisory Board

Prior to recruiting participants for concept mapping, this study will seek to collaborate with five community members that are recruited from the same defined neighbourhood area to form a Community Advisory Board (CAB). The CAB will provide feedback to the researchers' proposed methods of participant recruitment, the methodology of concept mapping and the dissemination of the findings. This will help to identify any errors or areas of improvement prior to conducting concept mapping with participants.

### Concept Mapping

This study will be seeking to recruit 22 participants aged 18 and above that were linked to the defined neighbourhood area by falling into at least one of the four categories: (1) residents, (2) employees or business owners, (3) students, and/or (4) volunteers. Candidates that are interested will be directed to the online platform, Qualtrics, to complete a detailed consent form and an online screening survey. The consent form will provide interested candidates with information regarding the study's purpose, the necessary commitment to participate and potential benefits and risks of completing the survey. The

screening survey will include a series of multiple-choice demographic questions with the exception of the question of ethnicity, which will be open-ended. Using the results of the screening survey, the researcher will randomly select 10 to 15 participants that would generate a diverse mixture of participants, particularly regarding the neighbourhood role, gender, age, ethnicity, income level, education level and current employment status. The screening survey will also remind participants that the neighbourhood role that they selected will be used to conduct a part of the concept mapping analysis. As such, their indication will be a requirement to participate in the study. The identified participants will be asked to commit to two half-day sessions for the completion of concept mapping and will each be compensated a total amount of \$110 in the form of a gift card for their full participation. Participants will receive \$80 for the relatively more intensive first session that requires participants to actively contribute their understanding of the neighbourhood and \$30 for the latter second session that is intended for participants to interpret and discuss the results of the final concept map.

In conducting purposive sampling, the researcher will seek that approximately half of the participants are either neighbourhood residents or employees/business owners of the area. Following these neighbourhood roles, we seek to recruit a mixture of participants that identify as females, males and different gender identities. We are also anticipating working with participants aged 18 and above, particularly that we have a mixture of approximately four or five participants that are aged 18 to 29, 30 to 40, 50 to 60, and 60 and above. As with ethnicity, we anticipate that we have a mixture of White and visibly minority groups, including Black, East Asian, South Asian, Southeast Asian, West Asian and Latin American. As per the City of Toronto's neighbourhood statistics, there is a greater population of South Asian neighbourhood residents in Crescent Town neighbourhood. We also seek that the neighbourhood residents and employees/business owners come with a range of income levels, such that there is a mixture of those that gain an income below \$50, 000 and above \$50, 000. Following, we also seek that we are recruiting participants with a range of education backgrounds, including those that come from a high school education, college or university education, technical training, and those without education backgrounds. Lastly, we also seek a combination of participants with different employment statuses,

including those currently unemployed and seeking employment or not seeking employment, currently employed, self-employed, homemakers, students, part of the military, retired and those unable to work.

### **GroupWisdom License**

The researcher purchased the Groupwisdom (previously known as CS Global MAX) single license to use the group concept mapping software offered by Concept Systems, Inc. The concept mapping software developed by this company was frequently cited within research studies that focused on using concept mapping (Burke et al., 2005; Minh et al., 2015; Vaughn et al., 2017) particularly because of its ability to conduct concept mapping in real time with participants either online or face-to-face. The license package enables researchers to undergo all the key steps of the concept mapping process, including generating the ideas, structuring the statements, analysis, interpretation and utilization (Trochim, 1989).

### **Concept Mapping**

Conceição, Samuel, and Binięcki (2017) discussed that by using Concept System, Inc.'s software, CS Global MAX, concept mapping will adhere to a cluster approach, which will follow a standard six-step process outlined by Trochim (1989). A cluster approach prioritizes the inclusion of participants in each stage of the methodology, a key focus of this research study. As such, participants are asked to generate, group and rate statements and following, the software is used to analyze the data to reveal clusters but participants have the decision-making power over how many clusters should be chosen, what they should be labelled and how this makes sense as a whole. Two other approaches that Conceição et al. (2017) discussed were the relational approach and the word-frequency approach. The relational approach is focused on the relationships between concepts and uses participant-generated concept maps, which are created through different methods, including interviews and questionnaires as well as researcher-generated concept maps. This approach adheres to the similar key steps of concept mapping through different methods. The third approach outlined by Conceição et al. (2017) is the word-frequency approach which uses the Leximancer software tool which compiles all the qualitative data collected and based on the frequency of words and co-occurrence with each other, it produces a concept



map. This approach is also similar but requires less involvement of the participant. To prioritize the inclusion of participants in the stages of concept mapping, the cluster approach was found to be the most ideal. The six key steps outlined by Trochim (1989; Kane & Trochim, 2007) are discussed below in relation to this research study.

### **1. Preparing for Concept Mapping**

In this first step, there are two key roles that need to be identified in preparing for concept mapping, including the facilitator of the session and all relevant parties to the outcome of concept mapping. For this study, these key roles include the lead researcher and the Community Advisory Board (CAB) who will need to agree upon the focus for generating ideas and the inclusion and exclusion criteria for participants. As the study is focused on two key identifiable areas, the following focus prompts for participants to generate ideas will be proposed to the CAB who may provide additional feedback as they see fit:

1. One issue in this community that causes chronic stress for you and/or others over time is \_\_\_\_\_.
2. One existing asset in this community that benefits you and/or others over time is \_\_\_\_\_.

The first focal prompt was designed to prompt participants to generate a list of stressful or frustrating issues that may be causing problems and are recurring in their local neighbourhood for themselves or those around them. The second focal prompt was created to prompt participants to generate a list of items or persons that have positively impacted their time in the neighbourhood. Both prompts are intended to be vague to allow participants to consider a wide range of potential issues they may think of. These prompts were also generated by considering common language and seeking to remove any research jargon that can be excluding. The following rating prompt for participants to rate the strength of the generated list of items from the previous step will also be proposed to the CAB:

1. How would you rate the importance of these neighbourhood issues and assets from 1 (weak) to 5 (strong)?

This rating prompt was created to prompt participants to rate the list of items in regard to how strong each item's impact is in regards to an item that can lead to chronic stress at a low or high level and

an item that can improve their resilience to chronic stress, which can also be impactful at a low or high level.

Once these prompts are agreed upon between the researcher and the CAB, the inclusion and exclusion criteria need to be discussed prior to participant recruitment. It will be proposed to the CAB that a diverse range of 10 to 15 participants aged 18 and above are recruited. This includes a varying range of participants in regard to demographics and neighbourhood roles. The CAB may have some additional feedback to provide and as they are also community members of the chosen neighbourhood, will likely reveal key insights about the most conducive methods of recruitment. It is expected that the researcher and CAB will agree upon purposive sampling for the sake of utility to ensure different perspectives via a range of neighbourhood roles and demographic characteristics are represented on the concept map and for the sake of feasibility, considering the budget and time restraints of the study (Padgett, 2012).

Following successful recruitment of participants, the researcher will be responsible to contact the list of participants via email to confirm their interest and availability for the scheduled dates. The researcher will also have chosen an accessible place to meet that is nearby or within the selected neighbourhood, such as a meeting room in a Toronto Public Library or community centre. The meeting point should also have parking available nearby and be accessible via public transit. Within the email, the researcher will also remind the participants that they may choose to bring a friend or family member to support their involvement in the session. For example, they may choose a family member that can help them with a potential language barrier or literacy challenge.

As per Kane and Trochim's (2007) suggestion, conducting concept mapping in two separate sessions in a small group of participants can increase efficiency and continuity of the sessions and reduce cost and travel times for the researcher and participants. Though they also suggest that three weekly sessions can be done, in order to increase the likelihood that this study's group of participants attend all sessions of concept mapping, it will be split into two. This study follows Kane and Trochim's (2007) recommendation when using two-half sessions, such that the first session focuses on generating ideas and structuring statements and the second session spends time on interpreting and utilizing the

resulted maps. Kane and Trochim (2007) have provided a general breakdown of the stages to plan accordingly. It is expected that this study will work within these guidelines:

*“Session 1*

Generation of statements: 75 minutes

Break: Minimum of two hours, to allow statement reduction and preparation

Structuring of statements: 75 minutes

*Session 2*

Interpretation of maps: 90 minutes

Break 30 minutes

Utilization and wrap-up: One hour” (Kane & Trochim, 2007, p. 40).

## **2. Generating the Ideas**

Prior to meeting with participants, the researcher will schedule a time to pilot test concept mapping with the CAB to identify any concerns or areas for improvement. Kane and Trochim (2007) described four main tasks involved in generating the ideas, including preparing all necessary equipment and coordinating with participants, introducing concept mapping to participants, facilitating the brainstorming task and synthesizing the ideas provided by participants. First, to prepare for this session, the researcher will have already confirmed the meeting point and time with participants but will send a reminder email one week prior to the date to all participants to ensure attendance. Materials that will need to be prepared include:

- Consent forms (20 copies)
- Gift cards (\$80 x 22 cards)
- Abundant amount of index cards, pens and markers
- Computer
- PowerPoint presentation of overview of concept mapping on a computer

- Projector
- Whiteboard
- Printer and paper
- Scissors

These items will need to be brought to the meeting room or if they are available at the community centre or library need to be booked in advance to ensure its availability. As concept mapping is a relatively novel research method, it will be particularly important that the overview of the research method and its purpose is well thought-out and presented using plain and simple language and without the use of jargon.

When participants arrive to the meeting point, they will be welcomed by the researcher into the meeting room and the team members that are present. The researcher will begin by guiding the participants through the consent forms and following, provide ample time to review the consent form and ask any questions. Once consent forms are collected, the researcher will provide an agenda for the day's session:

- Introduction to concept mapping and its purpose for this study (30 minutes)
- Brainstorming task to focal prompts (75 minutes)
- Break (2 hours)
- Structuring task (75 minutes)
- Wrap up and next steps (15 minutes)

A slideshow will be shown on the projector and guided by the researcher to help understand what exactly the concept mapping methodology is and the reasoning behind using this methodology for this study. As such, time will be built into the presentation to allow for questions in between slides. The presentation will highlight a brief definition of concept mapping, the six steps divided into two sessions, the advantages of using concept mapping and why it has been chosen for this study's purposes. Following this, the two focal prompts will be displayed on the projector and participants will have roughly 35 minutes for each focal prompt. As concept mapping typically only presents participants with one focal prompt, whether two can effectively elicit responses from participants will be discussed previously with the CAB. However, we anticipate asking two focal prompts to strategically plan for reducing chronic stress with existing assets

and new resources. To begin, the researcher and the group may have a few minutes to discuss any questions anyone has regarding the next steps. The researcher may also provide a reminder to participants that we are seeking roughly 10 responses from each participant and that we are anticipating a range of ideas by recruiting various roles and demographics from this community. At this point, the volunteer assistant will hand out one marker and a set of index cards to each participant and they will be asked to write down each response on each index card. The researcher will periodically check in with the participants.

Once the brainstorming stage is complete, the participants will be asked to take a 2-hour break while the researcher completes the idea synthesis stage with their team. The participants will be provided with lunch options and will be asked to return to continue to statement structuring. As explained by Kane and Trochim (2007), this stage is focused on synthesizing all the brainstormed statements through reducing statements that represent similar ideas and editing statements to ensure they clearly represent the idea. Idea synthesis will also effectively lead to a manageable set of statements for the participants to rate and sort in the next stage. However, Kane and Trochim (2007) remind researchers that this stage is not meant to remove statements from the pile unless they are without a doubt irrelevant to the focus prompt. It is critical to be careful not to remove statements that seem unpopular as participants will be rating these statements later and so, these statements will be identified later on. In order to synthesize the pile, it is recommended by the authors to consider organizing by keywords and ideas, while ensuring statements are clearly represented and do not represent more than one idea at a time. This will likely be done by inputting each final unique statement into an excel worksheet and numbered off. Once the statements are compiled, they will be printed at the library or community center to ensure there are a sufficient number of sets to be returned to the participants. The team will then cut up the statements so they can be put together like a deck of cards.

### 3. Structuring the Statements

Once prepared, the participants will be invited back from their break to structure the statements that have been synthesized. The researcher will quickly recap what the participants will do with the statements, namely, grouping and rating the statements. A set of statements will be provided to the

participants and they will be asked to spread out so that each participant has enough table space to organize the statements. The participants will be asked to group the statements based on similarities that they find, which can produce any number of groups (A. E. Green et al., 2012) so long as they are not grouped all together, all separately (i.e., each pile only containing one statement) and with statements overlapping piles (Kane & Trochim, 2007). Depending on the number of statements finalized, Kane and Trochim (2007) recommend allotting between 20 to 50 minutes for this stage. Once completed, each participant will use a recording sheet to detail the name of each pile and each statement's unique number. These will be returned to the researcher to input. Each participant will then receive a rating sheet for them to rate each statement based on the previously discussed question, "How would you rate the strength of these neighbourhood problems and assets from 1 (weak) to 5 (strong)?" It is recommended by Kane and Trochim (2007) that participants are encouraged to use the full Likert scale when rating the statements to ensure they are considering the statements relatively.

In addition to structuring the statements, the researcher will also remind the participants that their neighbourhood role (previously recorded on the screening survey) will be used to differentiate between participants. The participants will be given gift cards to the stores of their choosing for their time and efforts. They will have previously corresponded with the researcher which store or market they would prefer a gift card from, and these will be purchased ahead of time. All participants' consent forms and data produced for concept mapping will be protected and stored in the researcher's lab for the next stage of analysis.

#### 4. Concept Mapping Analysis

The researcher will set aside time to conduct the analysis of the data prior to the next meeting with the participants. First, as explained by Kane and Trochim (2007) the researcher will input the data into GroupWisdom for it to be organized in a matrix, such that each row represents the participant number, each column represents the statement number and each value represents the pile number the participant had sorted the statement into. As only one rating question was asked, there will only be one matrix needed. Following this, the value ratings for each statement are calculated as a group average. As Green et al. (2012) described, a similarity matrix is completed, in which a matrix is used to represent each

participant's decision to place any two statements together. In this study, there will be a total of 15 matrixes. For example, row one and column six would represent statements one and six respectively, and either the values, 1 (same pile) or 0 (different piles) will be inputted to indicate whether they were piled together or separately. The values are then summed for all participants which will lead to an overall square symmetric matrix that then undergoes the analysis of multidimensional scaling (MDS) (Green et al., 2012). The software, Group Wisdom will help to produce a 2D Point Map that represents the relationships between statements (Concept Systems, Inc., 2018). In other words, the statements that were more often grouped together will likely be grouped together as points on the map and similarly, those less often piled together will be farther apart. This is also expected to occur with the use of two focal prompts for this study but within these larger clusters, there may be more groups of points closely put together. In addition to the 2D Point Map, a stress value is produced that suggests how similarly the map represents the original data inputted and typically for concept mapping this ranges between 0.205 and 0.365 (Kane & Trochim, 2007).

The next step is to produce a cluster solution using the coordinates produced from the 2D point map created previously (Jackson & Trochim, 2002). Essentially, the researcher uses agglomerative cluster analysis and Ward's method for doing so to arrive at a suitable number of clusters to represent the statements in defined boundaries (Kane & Trochim, 2007). Agglomerative cluster analysis combines initially separate elements into one single cluster and Ward's method reduces "the sum of the distances between all statements in any two hypothetical clusters that might be joined" (Kane & Trochim, 2007, p.99). The produced cluster map is helpful in identifying the key concepts overlaying the 2D point map we created previously (Concept Systems, Inc., 2018). However, it is suggested by Kane and Trochim (2007) that the selected number of clusters is dependent on the purpose of each concept map and so the researcher can predetermine the number of clusters with the research team or choose to discuss this with the group of participants. It is also possible to predetermine a few varying cluster maps and conclude with participants afterwards.

The software, Group Wisdom will allow researchers to conduct anchoring or bridging analysis which tells the researcher the anchoring or bridging value of a statement on the 2D point map (Concept

Systems, Inc., 2018; Kane & Trochim, 2007). The anchoring or bridging value ranges from 0 to 1, where a high value will suggest that the particular statement plays the role of essentially bridging its surrounding statements and a low value will represent that the statement was grouped particularly because of its similarity with the surrounding statements by a majority (Kane & Trochim, 2007; Nadeem, Stoyanov, & Koper, 2011). Thus, these values will help the researcher help to interpret which statements are reflecting similarities in its content, which can also provide further aid to choosing the final number of clusters on the map (Jackson & Trochim, 2002). As one can decide if the boundaries of a cluster is accurately reflecting the statements within or perhaps dividing the statements into more than one cluster solution would be more effective.

Following, to prepare for the interpretation of the maps, the researcher will compile a few additional results, including cluster labels, pattern matches and go-zones. First, the researcher will use Group Wisdom to conduct labelling analysis which will help select a label for each cluster that can be discussed with the participants in the next stage (Kane & Trochim, 2007). This will find the most suitable label for the cluster based on the software's algorithm but if the results are not accurately depicting the clusters, the researcher may choose to review the pile labels initially suggested by participants in the sorting and rating stage to depict them manually (Minh et al., 2015). Second, the researcher will use pattern matching to depict a pattern-match or a ladder-graph to consider how similarly rated the clusters were between two groups of the participants (Trochim & Kane, 2005). In this study, the participants will be divided amongst solely neighbourhood residents and neighbourhood employees or business owners. This may change depending on the final group of participants. Third, the researcher will use go-zone displays, which similarly to pattern-matching will depict the bivariate relationship between two variables, the demographics of the participants and importance and feasibility of individual statements within a cluster (Kane & Trochim, 2007; Nadeem et al., 2011). The go-zone display seeks to display which statements were most rated highly in importance and feasibility to help prioritize specific ideas, such as those related to chronic stressors in this study.

Finally, as suggested by Kane and Trochim (2007), the researcher will create a slideshow, including the point rating map, cluster rating map, pattern-matching display and go-zone display to



present the results to the participants. The point rating map similarly to the 2D point map created previously will display the average rating of each statement based on all participants and the cluster rating map will include the average rating of all statements within each cluster (Kane & Trochim, 2007). As described previously, the pattern-matching display and go-zone display will help to understand how the differing neighbourhood roles affected the rating of clusters and statements. The purpose in presenting these results is to facilitate the opportunity to create mutual understanding and authorship of concept mapping's output and to discuss how these results can be utilized for this study's purpose (Concept Systems, Inc., 2018).

#### 5. Interpreting the Maps

Prior to meeting with participants, the researcher will have booked a common room to present the study's results and sent email reminders to participants for the date and time. The researcher will have prepared:

- Gift cards (\$30 x 22 cards)
- Audio recorder
- Computer
- PowerPoint presentation of second concept mapping session on a computer or USB
- Projector
- Whiteboard
- Physical copies of list of clusters and statements (23 copies)
- Pens (23) (Kane & Trochim, 2007).

As a result of two half-day sessions, it is expected the second half-day session may suffer from an increased attrition rate (Padgett, 2012), due to the decreased attendance of participants and so not all the diverse perspectives that contributed in the first half-day will continue to do so in the second-half.

However, it is anticipated that this may result in more efficient discussions being had. Once participants have arrived, the researcher will remind participants that participation is voluntary and gift cards will be provided near the end of the session unless participants leave prior to the end, in which they will receive them before doing so. The day's agenda will be presented:

- Recap of last week's session (5 minutes)
- Interpreting cluster map of chronic stressors (20 minutes)
- Interpreting cluster map of assets (20 minutes)
- Break (15 minutes)
- Structured exercise for strategically planning asset-based solution (35 minutes)
- Next steps (30 minutes)

It should be noted that the allotted time for the interpretation of clusters may vary depending on the results, such that more clusters within chronic stressors or assets may require more time and vice versa. The participants will be reminded that these are the results of their contributed knowledge and their involvement in this session will help to refine these maps that they have ownership over (Kane & Trochim, 2007). First, the basic point map will be shown to help understand where each generated statement is plotted visually. Second, the portion of the cluster map displaying neighbourhood chronic stressors will be shown and explained to participants, particularly that the labels are generated by Concept System, Inc.'s algorithm and refined by the researchers. An example of a point map and cluster map is shown in Figure 1.

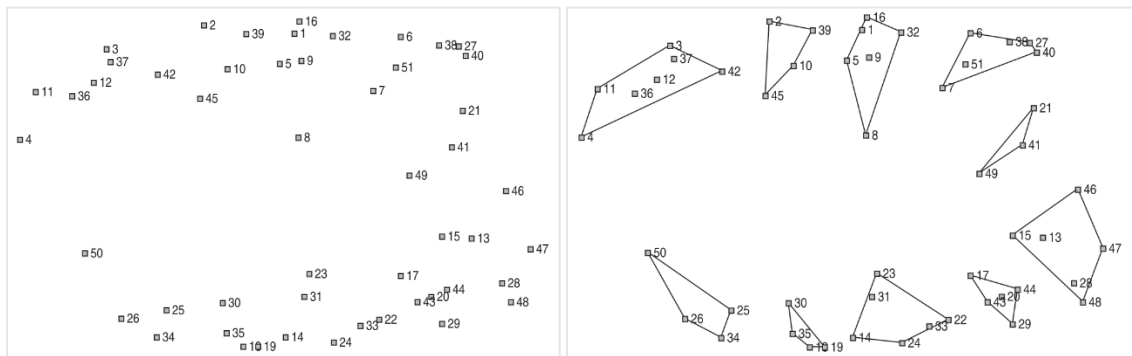


Figure 1. Point Map and Ten-Cluster Map of Women's Perceptions of Residential Neighbourhoods Factors and Intimate Partner Violence Experiences (Burke et al., 2005).

The researcher will also provide each participant a physical copy of a list of the clusters of neighbourhood chronic stressors and statements within each cluster. The participants will use approximately ten minutes to review this list independently and following, share with the larger group

observations and suggestions to refine the cluster labels or to regroup statements into a different cluster. This discussion will occur for 20 minutes and be audio-recorded, or a member of the research team will take notes to ensure feedback is not being missed. Having this discussion will help the participants understand the clusters and provide suggestions to better improve the cluster map's representation of the participants' perspective. Following the discussion of the neighbourhood chronic stressors, the cluster map displaying the portion of the neighbourhood assets will be shown. Similarly, participants will receive a physical copy of the list of the clusters of the neighbourhood assets and its statements and use ten minutes to review the cluster map. Participants will once again share observations and suggestions to improve the cluster map to better reflect participants' views of the existing neighbourhood assets for 20 minutes. This section will also be audio-recorded, or notes will be taken to record feedback of the cluster maps. This will conclude the interpretation stage and collected feedback will be used to refine the maps.

After the scheduled break, the participants will be presented with the cluster rating map, which depicts the average importance rating of each cluster using layers. This is helpful in identifying the relatively most prioritized or critical areas of stressors and assets to consider. An example of a cluster rating map is shown in Figure 2.

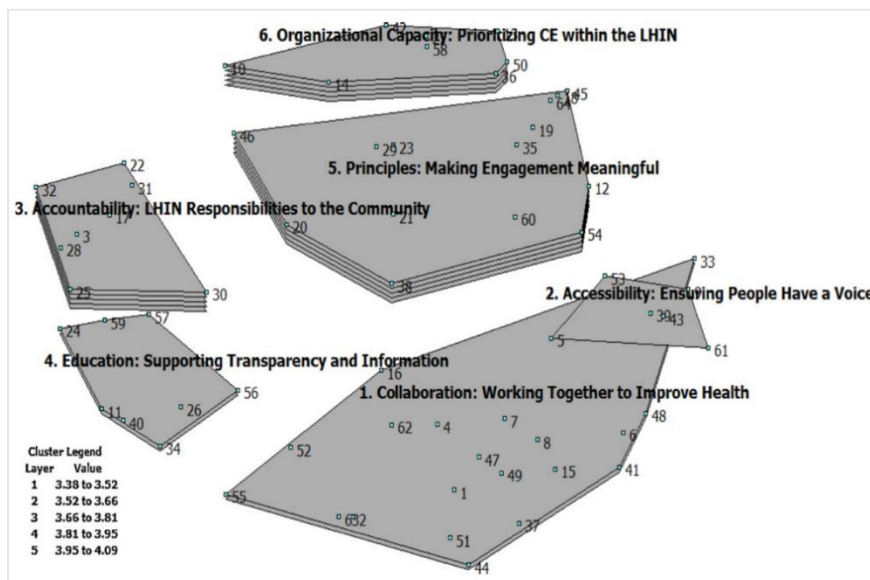


Figure 2. Cluster Rating Map of Local Health Integration Networks (LHIN) Ontario Staff's Conceptualization of Effective Community Engagement (Jabbar & Abelson, 2011).

The participants will learn which clusters were rated highly important by the majority of participants. However, it should be noted that this does not suggest that other clusters or statements are less important or deserve less attention, rather based on this group of participants, some clusters are rated as more important than others. The next structured exercise will focus on the cluster rated as highly important by a majority of participants for the sake of time and feasibility. Other clusters and statements can still be explored beyond this concept mapping session.

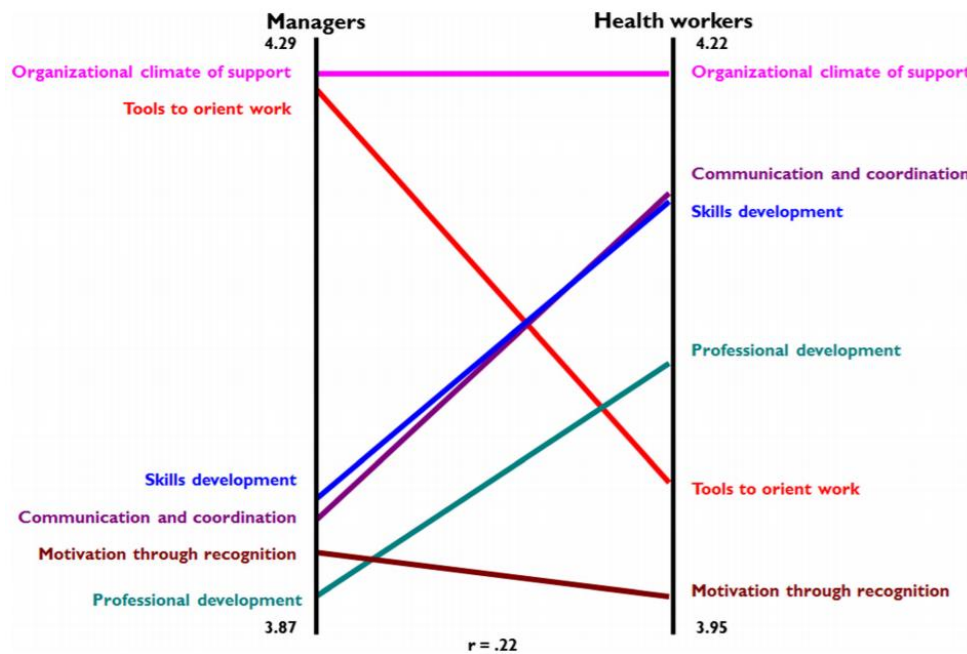
## 6. Utilization

The last stage of concept mapping includes a discussion of the results and the group of participants can use these results in the planning for stress and resiliency in their neighbourhood. As described by Kane and Trochim (2007), concept mapping can be an effective method to combine strategic planning and action together. As all the participants' views are represented on the maps, it allows the researchers and the participants to prioritize the key areas to focus on, while not dismissing others' contributed knowledge. This discussion should also be audio-recorded to learn and record the different contributed ideas and how researchers and participants arrived to the potential asset-based solutions. The group of participants will take part in the structured exercise, "1-2-4-All" in which participants will independently focus on one statement within the prioritized cluster for one minute. Participants will then share with their assigned partner next to them what statement they focused on and the cause of this chronic stressor for two minutes. Following, the pair will share with the assigned pair next to them and focus on exploring one chronic stressor, the cause of this chronic stressor and one representative will share with the larger group after four minutes. This exercise will allow all participants to participate and build upon each other's ideas to focus on one chronic stressor statement. Once completed and every group has shared, the researcher will focus on two chronic stressor statements within the cluster and the cause of these statements will be discussed with all participants.

Next, the participants will complete the "1-2-4-All" exercise once again but will instead focus on one asset that can be used to build a solution for the two discussed chronic stressor statements. This can be an asset that is within the cluster map or missing. The participants will similarly focus on one asset independently for one minute, share with their assigned partner for two minutes and further discuss with

another pair of participants for four minutes prior to sharing with the larger group. One representative of each group will share one solution for one or both chronic stressors. This will help engage other participants to build on top of each other's ideas and consider what additional resources are needed for these asset-based solutions. This exercise and discussion will occur for approximately 30 minutes.

The researcher may also consider showing the results, pattern matching and go-zones, both of which will indicate how different neighbourhood users rated clusters and individual statements. The pattern matching will depict how different neighbourhood users rated the strength of different clusters. The go-zone will display how different neighbourhood users rated the strength of statements within one cluster. The researcher may choose to analyze the cluster rated as highly important by most participants and display this to participants to help understand how residents and employees may rate these statements differently. An example of pattern matching and a go-zone display is shown in Figure 3.



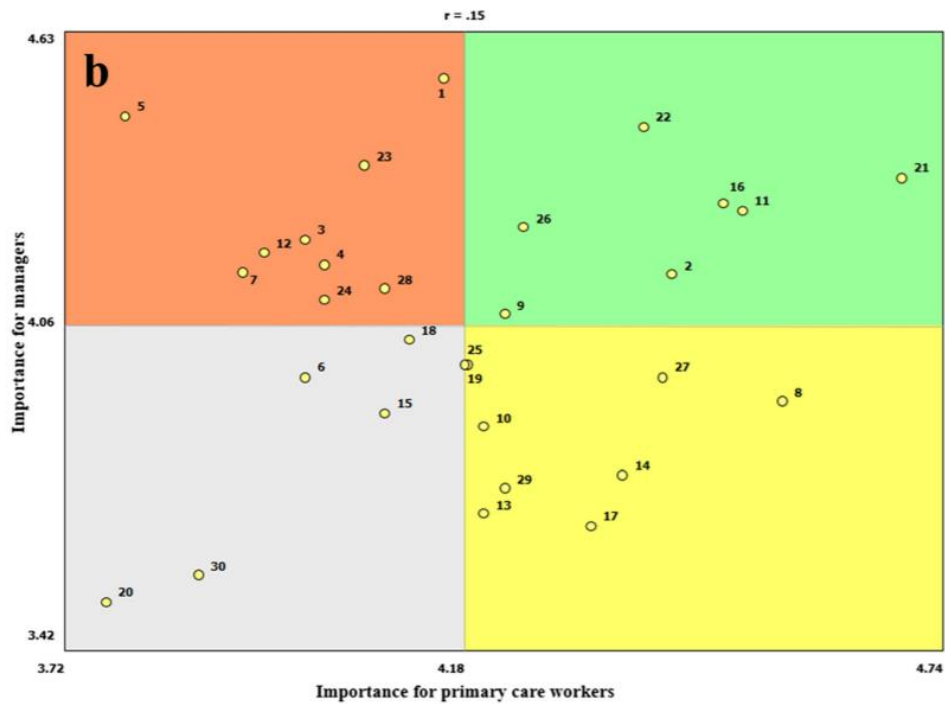


Figure 3. Pattern Matching and Go-Zone Display of Managers and Health Workers' Perceptions of Actions Needed to Support Auxillary Nurses' Performance (Hernández, Hurtig, Dahlblom, & San Sebastián, 2015).

Finally, the researchers and participants will discuss who these results can be shared with and what changes would participants like to see? As these maps are the product of their knowledge, they have ownership over how the results should be disseminated and where the results can be shared to lead to change. This will occur for approximately 30 minutes and wrap up the final session for concept mapping as participants are thanked for their contribution and receive their gift card compensation.

## **Appendix E – Concept Mapping Consent Form**

WILFRID LAURIER UNIVERSITY  
DEPARTMENT OF PSYCHOLOGY  
CONSENT FORM – CONCEPT MAPPING

Using Social Media to Engage Toronto Communities for Resiliency and Stress Planning

Principal Investigator: Martha Ta, graduate student

Faculty Supervisor: Dr. Ketan Shankardass, faculty member and researcher

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You are invited to participate in a research study. The purpose of the study is to pilot a novel research method to increase community resilience (a community's ability to adapt to challenges) and lower chronic emotional stress through a combination of Twitter analysis and community engagement. This research is conducted by Martha Ta, a Wilfrid Laurier University Community Psychology graduate student with the supervision of Dr. Ketan Shankardass, an associate professor of Wilfrid Laurier University.

### **INFORMATION**

This study began with an emotion analysis of public Twitter Tweets that are geo-tagged within the city of Toronto to understand where high rates of chronic emotional stress and low rates of community resilience are found. After successful recruitment, a community advisory board (CAB) of five members was established. The CAB provided feedback on the Twitter analysis findings, proposed participant recruitment strategies, methodology (concept mapping) and plans to share the study's findings.

In this phase of the study, participants were recruited within the identified communities to take part in concept mapping sessions. Interested candidates completed an online screening survey and answered a series of demographic questions to recruit participants that are representative of all groups. From the pool of interested candidates, 10-15 participants were selected for this study that have a demonstrated link to the community (e.g., as a local resident, employee, student and/or volunteer). Using the concept mapping software, they will aid in strategizing a plan to cope with chronic stress and improve community resilience with their experience with chronic stressors and local assets or resources they have accessed or know of to help with the effects of stressors. They will also provide feedback for the use of the concept mapping tool in planning for stress and resiliency. This will require 8 hours (i.e., 1 full day or 2 half days) of participants' time. Please note that participants must reside and/or work in one of the communities identified by the Twitter analysis, and must be 18+ years of age.

Finally, the community will be provided with a Geolive map website link, in which the community's assets and resources as well as stressors that can be pinpointed will be located. This online map can also be edited by community members.

### **RISKS**

Concept mapping participants are expected to discuss activities, events or other stimulus that has chronically caused feelings of stress and resources or assets that they have been able to access or know of to help with stress. Thus, participating in this study may lead to an emotional risk. These feelings are normal and should be temporary. If you experience any persistent negative feelings as a result of participating in this study, please contact the researchers and/or a local mental health care facility. To find local resources in Canada, visit <http://www.cmha.ca/mental-health/find-help/>. All participants are to be reminded that their participation is voluntary and they should only share information they are comfortable with sharing in a group.

## **BENEFITS**

Participants will benefit from the potential for improvement in their community as they take an active role in voicing the needs for supports and resources in their local area. The larger society will also benefit as this study aims to pilot a method to plan for chronic stress and low resilience within communities. Combining novel technology and community voices, this is an opportunity to consider how effectively this study's methods can be used to anticipate the kinds of supports necessary to overcome emotional stress. The results of this study can contribute to future research studies and shape the opinions of urban planners, political figures, community psychologists and others in social and health fields.

## **CONFIDENTIALITY**

Please note that confidentiality cannot be guaranteed in a group setting. All group meetings will be held in-person and in a private room to maintain privacy for concept mapping participants. Meetings will be audio-recorded pending participants' approval and used to understand how effective concept mapping is as a tool for stress and resiliency planning. All participants can choose how they would prefer to be identified. Any quotations used will only identify the name chosen for this research study and will require the consent of the participant first.

Only the researchers, Martha Ta and Dr. Ketan Shankardass, and the research assistants hired for this study, will have access to the data. All electronic files will be password protected and stored in a secure file or on a USB flash drive. Any identifiable data and/or contact information will be destroyed at the end of the study (i.e., by April 30, 2019). The de-identified data, consent forms, and payment records will be destroyed by the researchers after 7 years (i.e., by April 30, 2026) to respond to any necessary research allegations and to remain in compliance with the Canada Revenue Agency's Income Tax Act."

## **COMPENSATION**

For participating as a concept mapping participant, you will receive a total of \$110 in the form of a gift card (\$80 at the first session and \$30 at the second session). If you choose to withdraw from the study, you will still receive the same amount of compensation. Any compensation received related to the participation in this research study is taxable. It is the participant's responsibility to report the amount received for income tax purposes and Wilfrid Laurier University will not issue a tax receipt for the amount received.

## **CONTACT**



This project has been reviewed and approved by the Wilfrid Laurier University Research Ethics Board (REB #5852), which is supported by the [Research Support Fund](#). If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Jayne Kalmar, Research Ethics Board Chair, Wilfrid Laurier University, 519-884-0710 ext. 3131, [REBChair@wlu.ca](mailto:REBChair@wlu.ca).

**If you have questions at any time about the study, procedures, or your payment (or you experience adverse effects as a result of participating in this study), please contact the student researcher, Martha Ta, at [taxx9300@mylaurier.ca](mailto:taxx9300@mylaurier.ca), or the supervisor, Dr. Ketan Shankardass at [kshankardass@wlu.ca](mailto:kshankardass@wlu.ca).**

## **PARTICIPATION**

Your participation in this study is voluntary. If you choose to participate, you may skip any question or procedure or completely withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you choose to withdraw from the study, your data will be destroyed. Your data cannot be withdrawn once data collection is complete because the data will be stored without identifiers.

## **FEEDBACK AND PUBLICATION**

The results of this study may be shared in journal articles with open access and presentations at academic or community settings. Participants can obtain information about the results of the research by contacting the researcher, Martha Ta, at [taxx9300@mylaurier.ca](mailto:taxx9300@mylaurier.ca). The results will be available by April 30, 2019.

## **CONSENT**

I have read and understand the above information. I have received a copy of this form. I agree to participate in this study.

Participant's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Investigator's signature: \_\_\_\_\_ Date: \_\_\_\_\_

### **Consent for Audio Recording**

(Please check the appropriate box)

- I allow the researchers to audio record the Concept Mapping meetings.
- I DO NOT allow the researchers to audio record the Concept Mapping meetings; instead, I prefer that written notes be taken during the discussion.

Please note that if any one participant does not consent to the audio recording of the meetings, the researchers will alternatively take written notes during the discussion.

### **Consent for Quotations**

(Please check the appropriate box)

- I allow the researchers to use my de-identified quotations from the Concept Mapping meetings. I understand that I will not have an opportunity to review my quotations before they are used, but I trust that the researchers will remove any identifying information before they are published/presented.
- I DO NOT allow the researchers to use my quotations from the Concept Mapping meetings.

**Consent for Use of Screening Survey Data (including neighbourhood role, age, gender, ethnicity, education, employment status and household income).**

(Please check the appropriate box)

- I allow the researchers to link my screening survey data that I previously selected in the screening survey to conduct further analyses.
- I DO NOT allow the researchers to use my screening survey data to conduct further analyses.

## Appendix F – Brainstormed Statements

*Table 1: Average Importance Rating of Generated Statements*

Cluster	Statement	Average Rating	
<b>1. (s) Barriers to access and social isolation</b>	1. (S)No non-sketchy bars nearby (alcohol bars)	1.88	
	6. (S)Mom is in retirement and there are no events/activities for her	3.50	
	14. (S)Congestion in school	2.75	
	28. (S)Medical Centre no longer accepting walk-ins	2.88	
	36. (S)Lack of leadership/pride in community (beacon of hope?)	3.75	
	39. (S)Noise - traffic, train, animals	2.63	
	45. (S)Commute - needing to travel far, time wasted, TTC available and delays	3.38	
	65. (S)School and travel to school as the Crescent Town public school accepts students only to fourth/fifth grade	2.13	
	66. (S)Nearby parks being used for innappropriate activities (i.e., drugs, drinking and not wanting children to be exposed to this)	3.38	
	68. (S)Choosing a school for children to attend after Crescent Town	1.88	
	82. (S)School (grade 5 has to go to George Webster school, parents are worried)	2.13	
	126. (S)In the past this area was related to crime but the reputation still stands	2.43	
	128. (S)Community facilities such as doctors, restaurants, grocery stores nearby	3.43	
	203. (S)Lack of adequate commercial services (e.g., no restaurants or proper coffee shop)	3.83	
	204. (S)Physical barriers in condo complex	4.33	
		<b>Count Std. Dev. Variance Min Max Average Median</b>	
		15 0.74 0.55 1.88 4.33 2.95 2.13	
	<b>2. (s)Need health/social support services/businesses</b>		<b>3.30</b>
	12. (S)Drug abuse in youths	3.25	
	17. (S)Lack of youth mental health support at school (i.e., early detection, support)	3.38	
21. (S)Lack of a tenants association in the rental buildings	3.13		
29. (S)Expensive to take cab to nearest clinic	2.25		
35. (S)Mental illness and their effects on the community	3.25		
40. (S)People - transient, those who don't care about their surroundings	3.88		
44. (S)Lack in clarity of resources - don't know what's available and for what or whom is eligible	3.38		
46. (S)Monotony, dullness, routine	3.13		
62. (S)Long waitlines for healthcare	3.13		
72. (S)Sometimes long waiting periods to see a doctor	2.71		
117. (S)Chronic health problems	3.75		
130. (S)Unhealthy living	3.29		
136. (S)Facing chronic health issues (e.g., diabetes and heart attack)	3.57		
144. (S)Need cheaper grocery stores in community	4.00		
198. (S)How to help someone over fifty years old	3.67		

	205.	(S)Seeing self-harm behaviour in my neighbours							3.14
			<b>Count</b>	<b>Std. Dev.</b>	<b>Variance</b>	<b>Min</b>	<b>Max</b>	<b>Average</b>	<b>Median</b>
			16	0.42	0.18	2.25	4.00	3.31	3.13
<b>3. (s) CT appearance, maintenance &amp; infrastructure</b>									<b>3.60</b>
	7.	(S)Elevators constantly broken in my building							4.38
	11.	(S)The childcare centre is right in the neighbourhood, which would be convenient in the future when we have kids but it has a low AQL rating from inspections so I will not want to put my child in that daycare centre (meaning have to commute/go on more wait lists for a better centre)							2.00
	16.	(S)Old buildings, maintenance issues, garage, elevators, repairs, etc.							4.63
	19.	(S)Public image of Crescent Town not as a good neighbourhood							3.13
	20.	(S)Empty business locations gives a bad atmosphere feeling							3.75
	24.	(S)Repairs that take a long time to get done or not done at all (i.e., machine on roof running all night for weeks prevents proper sleep)							4.00
	25.	(S)Community bus - often does not run to schedule, must wait over an hour in very bad weather, drivers do not stop, only transit on Crescent Town Road							2.88
	26.	(S)Lack of accessibility of building							2.75
	31.	(S)Spread of pests - fear of contact with bedbugs							5.00
	41.	(S)Lack of nature/beauty							3.13
	42.	(S)Store fronts looking old or not improving							3.13
	47.	(S)Problems that arise in relation to weather: flooding, snow, power outage							3.88
	54.	(S)Lack of structured mechanism of overall community engagement							3.75
	55.	(S)Physical barrier for condo							3.00
	56.	(S)Building accessibility							2.63
	58.	(S)Deteriorating property value							3.63
	61.	(S)Infrastructure breaking down, elevators not working							4.38
	64.	(S)Staircases that are not well lit during nighttime hours							2.88
	69.	(S)Increased rent every year							4.25
	70.	(S)Problems with electricity and water from time to time							3.13
	73.	(S)Dealing with pest control							4.38
	74.	(S)Roaches, bedbugs							4.88
	75.	(S)Overcrowding in elevators							3.50
	76.	(S)Elevator breakdowns							4.25
	77.	(S)Lack of cleanliness outside the building (i.e., strong, spicy odors, overpopulated condition of building quickly aging)							4.63
	79.	(S)Rent issue (is getting higher day by day)							4.25
	81.	(S)School issues, Crescent Town bridge broke, kids passing/crossing through the busy road							2.75
	84.	(S)Long waitlist for everything							3.13
	93.	(S)No access for wheelchair							2.75
	94.	(S)No snow removal							3.13
	95.	(S)Pigeons							3.13
	96.	(S)Loose tile on walk way							3.29
	97.	(S)Elevators							4.14
	100.	(S)Alarm testing							2.38
	103.	(S)Not well maintained apartment							4.13
	113.	(S)Bedbugs							4.63
	120.	(S)A lot of places are not wheelchair accessible							3.00
	123.	(S)The elevators in my building are always broken							3.63
	124.	(S)The maintenance of the community buildings and facilities							4.13
	129.	(S)Cleanliness around Crescent Town							4.14
			<b>Count</b>	<b>Std. Dev.</b>	<b>Variance</b>	<b>Min</b>	<b>Max</b>	<b>Average</b>	<b>Median</b>
			40	0.74	0.55	2.00	5.00	3.61	3.75
<b>4. (s) Social disorder and safety</b>									<b>3.51</b>

	13.	(S)Safety (e.g., underground parking)	3.88
	15.	(S)Garbage around neighbourhood	4.63
	32.	(S)Aging infrastructure - feeling unsafe in and around buildings	3.50
	33.	(S)Overcrowding	3.38
	43.	(S)Roads, sidewalks looking run down	3.00
	49.	(S)Division between neutral and condo residents	2.25
	51.	(S)Lack of dignity and respect by management staff	4.38
	59.	(S)High density	4.00
	92.	(S)Number of people per square feet is very high	3.63
	98.	(S)Kids running in hallway	3.13
	99.	(S)Doors slamming shut	2.25
	122.	(S)The snow is never clear and I can't get my wheelchair out	3.50
	140.	(S)Lack of proper emergency devices	3.50
	202.	(S)Lack of structured mechanism for community engagement	4.33
		<b>Count Std. Dev. Variance Min Max Average Median</b>	
		14 0.69 0.48 2.25 4.63 3.52 4.19	
<b>5. (s) Newcomers and community integration</b>			<b>3.31</b>
	2.	(S)No diverse community events (only South Asian ones)	3.63
	3.	(S)Mostly South Asian stores around here so it's hard to find groceries I or my spouse like without going further away (even the local Massey Square store only sells South Asian groceries/snacks)	3.50
	4.	(S)Neighbours/fellow building people ignore you or duck their heads when you say "hi" or try to acknowledge them (worse for my spouse who is European as neighbours literally run away if he tries to say "hi" or "hello")	3.63
	5.	(S)Community seems uninterested in interacting with people outside of their in-group	4.00
	8.	(S)Feel a lack of diversity	3.75
	18.	(S)Loneliness with seniors - support groups for the elderly	3.25
	22.	(S)People who do not like the changing demographic in the neighbourhood	2.88
	23.	(S)Racism	4.13
	34.	(S)Tribe mentality	3.25
	50.	(S)Ethnic concentration of a specific group versus diversity	3.75
	52.	(S)Oppressive culture among specific groups	2.75
	53.	(S)Lack of independent representation of residents (no community association)	3.50
	71.	(S)Ethnic conflict	4.00
	78.	(S)People's attitude in the building can be either ignorant or negligent, it could be a friendly neighbourhood to either a class or race but not always or necessary inclusive	3.88
	83.	(S)Generation gap between parents and children	2.63
	86.	(S)Adapt with the new weather condition	3.75
	87.	(S)Language barrier	3.13
	88.	(S)Some of the people are highly skilled/educated and have to take up survival jobs due to lack of Canadian experience	3.75
	89.	(S)The fact that most of the population in this neighbourhood are new immigrants	2.88
	90.	(S)New immigrants come with a very specific set of issues (settling down to new culture, employment, housing, language barrier)	3.75
	91.	(S)Continuous flow of new immigrants	3.00
	104.	(S)Degree or education have no value unless they upgrade here and may not have time or money or resources	3.63
	105.	(S)People have to face cultural diversity that may be cultural shock sometimes	3.25
	107.	(S)In this community mainly immigrants live so they may have social anxiety. Also missing their family which are living in back home	2.88
	108.	(S)Not settled yet	2.88
	109.	(S)Work stress I can handle but even after 10 years in Canada, we are	3.13

		not settled yet, still struggling							
	112.	(S)Lots of experiences, lifestyle							3.25
	114.	(S)Newcomer community							2.43
	116.	(S)More and more Islamization happening in the community							2.63
	118.	(S)More and more new immigrants prefer to be at home and not to contribute in job force							2.88
	119.	(S)Different communities do not feel they are Canadian first							3.63
	127.	(S)The number of people from one racial background living here							2.71
	132.	(S)Climate change from back home to Canada							2.71
	133.	(S)Unbalanced diet							3.14
	134.	(S)Cultural gap between youth and adults							3.00
	135.	(S)Mental illness in the South Asian community							2.71
	137.	(S)Islamaphobia							3.57
	199.	(S)As a newcomer we need time to accept new ways of thinking and behaving according to Canadian culture							3.50
	200.	(S)Newscomers need help with information about new paperwork; opportunities for voluntary work; for job experience							3.67
	201.	(S)Lack of independent representation of resident (no community association)							3.83
		<b>Count</b>	<b>Std. Dev.</b>	<b>Variance</b>	<b>Min</b>	<b>Max</b>	<b>Average</b>	<b>Median</b>	
		40	0.45	0.21	2.43	4.13	3.30	3.38	
<b>6. (s) Income insecurity</b>									<b>3.27</b>
	9.	(S)Feel a bit isolated living here							2.75
	10.	(S)All my childhood/high school friends say that they know this neighbourhood is ghetto and have high # of low income people but I moved out of another housing project to come here							2.38
	27.	(S)Steps prevent mobility devices from using sidewalk, must walk or ride among cars, trucks, etc.							3.00
	30.	(S)Noisy neighbours - parents allow children to play loud games in hall, lack of sound baffling on floors							3.00
	37.	(S)Unemployment							3.63
	38.	(S)Homelessness, lack of affordable housing							3.38
	48.	(S)Too many choices or options							1.50
	57.	(S)Accessibility overall							3.50
	60.	(S)Increased cost of living							4.00
	63.	(S)Hearing stories about criminal events that occur in the neighbourhood (i.e., robberies)							3.63
	67.	(S)Expense of childcare for working parents							3.13
	80.	(S)Job (hard to find professional field related job)							3.38
	85.	(S)Lack of education about nutrition, physical activity							3.38
	101.	(S)Cost of rent is too high							4.00
	102.	(S)Crime in the area is very high							3.25
	106.	(S)Low income or no jobs							3.75
	110.	(S)Toronto city is very expensive now, jobs are not fulfilling the basic needs							3.75
	111.	(S)Work, job, income							3.88
	115.	(S)Uncertainty about job							3.75
	121.	(S)My rent is more than I can afford							3.88
	125.	(S)This area is determined as low income even though most people living here work for a living							2.57
	131.	(S)Unemployment in the South Asian community							2.71
	138.	(S)Lack of services to young professional							3.14
	139.	(S)Majority of seniors - specific age groups							2.71
	141.	(S)We need free lawyers							2.86
	142.	(S)Improve job opportunities							3.43
	143.	(S)Increase hourly pay to fulfill basic needs							3.71
		<b>Count</b>	<b>Std. Dev.</b>	<b>Variance</b>	<b>Min</b>	<b>Max</b>	<b>Average</b>	<b>Median</b>	
		27	0.57	0.32	1.50	4.00	3.26	4.00	
<b>7. (a) Sense of belonging and</b>									<b>3.67</b>

**social cohesion**

145.	(A)Spouse	3.14
167.	(A)Range of multiculturalism	3.57
182.	(A)Religious services at Crescent Town Hall	3.00
184.	(A)Lots of people who can be nice and do favours due to the tight-knit community	3.86
197.	(A)Can meet same community people	3.43
211.	(A)Friendly neighbours	4.43
213.	(A)People are friendly	3.67
215.	(A)Community group that meet for coffee and chat	2.83
217.	(A)More opportunities to express out lived experience to facilitate change in the neighbourhood	4.00
227.	(A)Having a small network of friendly neighbours and a place to meet publicly	3.86
231.	(A)Simply, homely community	4.43
233.	(A)Community fairs and festivals help people from various backgrounds come together	3.71
	<b>Count Std. Dev. Variance Min Max Average Median</b>	
	12 0.49 0.24 2.83 4.43 3.66 4.05	

**8. (a) Community and business services**

**3.78**

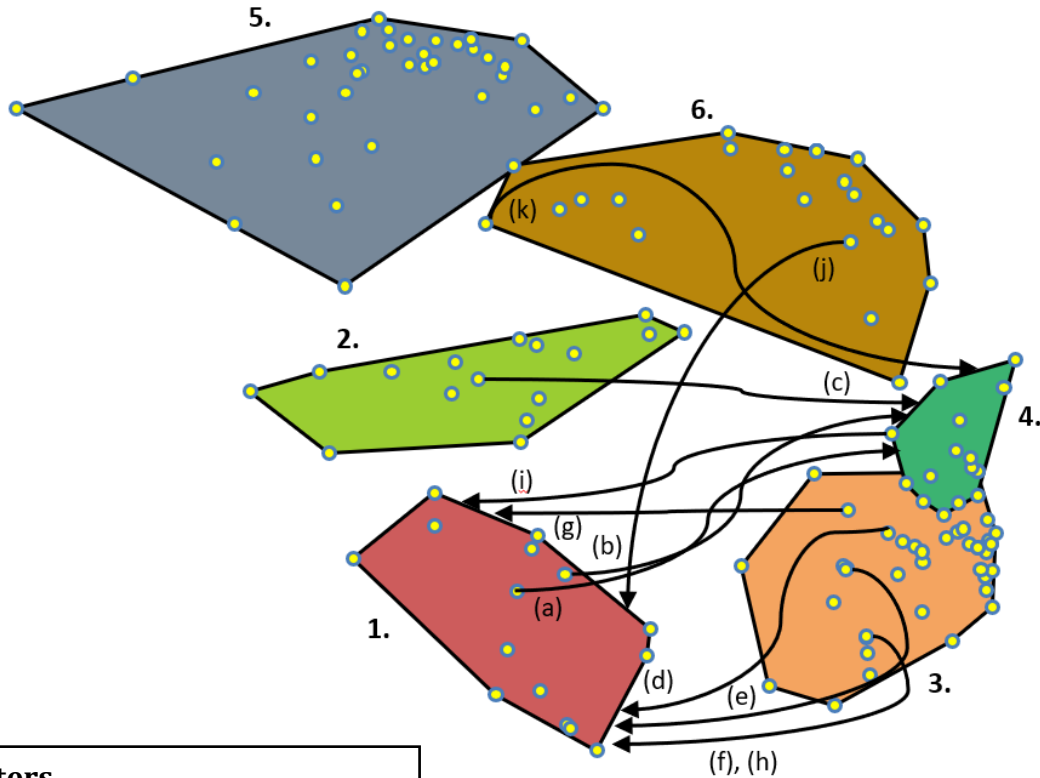
146.	(A)Nofrills, dollarama (affordable groceries)	4.57
147.	(A)Community centre in Massey building	3.71
148.	(A)Sports teams/activities for children/youth	4.00
149.	(A)Summmer camps for children	4.00
150.	(A)Crescent Town public school	4.00
152.	(A)Local dentists	3.57
153.	(A)The one single sushi restaurant nearby	1.71
154.	(A)Health club	4.00
155.	(A)Doctor's office	4.29
156.	(A)Close to other businesses (e.g., bank, grocery, mall)	4.14
162.	(A)Community Centre (Access Point)	4.00
163.	(A)Neighbourhood services, employment centre (Neighbourhood Link, Danforth LINC, Woodgreen)	4.29
165.	(A)Variety of businesses	3.29
166.	(A)Schools and youth services nearby	4.14
168.	(A)Community events	3.14
171.	(A)Convenient health services (x-ray, ultrasound clinic, doctors' offices, mental wellness)	4.14
173.	(A)Newcomer support from several organizations	3.43
174.	(A)Shwasti - a community organization dedicated to community wellness	3.17
175.	(A)Azad Grocery store	2.83
177.	(A)Crescent Town services council - match needs of the community with service providers	3.14
178.	(A)Harmony Hall Centre for seniors stallite office in Crescent Town club	3.57
180.	(A)Dawes Road library branch	4.00
181.	(A)Supermarket and pharmacy within Crescent Town	4.14
183.	(A)Medical clinic within Crescent Town	3.86
185.	(A)Tutoring other private businesses in the apartments which is convenient and easy to go to	2.71
186.	(A)Healthcare centre at Crescent Town is nearby (access to family doctors and specialists) and easily accessible for those without a car	4.43
187.	(A)Kickstart, an after school program that can watch over children, give them food, and take them to places at	3.71
188.	(A)Walking distance to Access Alliance, another community centre with great programs	3.43
189.	(A)Physical activity, recreational	3.86
190.	(A)Community services	3.57

	191.	(A)Crescent Town club that contains physical activity room (gym), swimming pool and recreational from having kitchen access	4.57
	192.	(A)Various community agencies have their satelite office at Crescent Town club (provide different programs)	3.43
	194.	(A)Fitness club	4.00
	206.	(A)Community Centre where you can get helpful information, access computers; help with formfilling; courses in conversation	3.86
	207.	(A)Community centre personelle are on gaurd to help with solving issues, such as tax return completion, clubs for solcializing	3.57
	208.	(A)Crescent Town Club	4.57
	214.	(A)The convenience store that recently opened	3.29
	226.	(A)Close to big grocery stores/affordable food	4.43
	228.	(A)Somewhat able to access locally grown food at Main and Danforth	3.57
	229.	(A)Easy babysitting	4.00
	230.	(A)Gym/swimming pool	4.43
		<b>Count Std. Dev. Variance Min Max Average Median</b>	
		41 0.57 0.32 1.71 4.57 3.77 3.57	
<b>9. (a) Natural environment</b>			<b>4.16</b>
	151.	(A)Taylor Creek trails to take a walk/bike	4.43
	157.	(A)Less winter maintenance (e.g., snow shovelling, underground parking)	3.43
	159.	(A)Close to two parks (opportunities for praying, fresh air, physical activity)	4.29
	160.	(A)Good improvements in building (Lobby upgrades)	3.71
	169.	(A)Quiet environment/places	4.29
	170.	(A)Calming natural surroundings	4.57
	172.	(A)Taylor-Massey Creek	4.43
	193.	(A)Making wheelchairs accessibly by repairing the walkways	4.00
	210.	(A)Ravines	4.14
	221.	(A)Improved housing condtion/cleanliness/pest control	4.29
	222.	(A)Rent control	3.86
	224.	(A)Parks trails	4.43
	225.	(A)Close to beaches	4.29
		<b>Count Std. Dev. Variance Min Max Average Median</b>	
		13 0.32 0.10 3.43 4.57 4.16 4.43	
<b>10. (a) Accessibility and security</b>			<b>4.48</b>
	158.	(A)Fairly safe area (no gun violence)	4.43
	161.	(A)Affordable area (property tax)	3.86
	164.	(A)Accessible public transit, convenient (24 hours blue line)	4.86
	176.	(A)404 Community Bus	4.00
	179.	(A)Proximity to TTC	4.86
	195.	(A)Close to subway	4.71
	196.	(A)Bus service	4.43
	209.	(A)Close access to TTC	4.71
	212.	(A)Subway is close by	4.67
	216.	(A)Less crime	4.86
	218.	(A)Enhanced security from the bridge leading to the subway, especially for kids	4.29
	219.	(A)Safety measures, including monitoring by police and lighting	4.29
	220.	(A)Timely snow removal	3.86
	223.	(A)Close to TTC	4.71
	232.	(A)Easy access to TTC	4.71
		<b>Count Std. Dev. Variance Min Max Average Median</b>	
		15 0.34 0.12 3.86 4.86 4.48 4.71	



## Appendix G – Annotated Cluster Map Based on Participants’

Figure 1: Annotated Cluster Map of Neighbourhood Chronic Stressors as Per Participants’ Feedback.



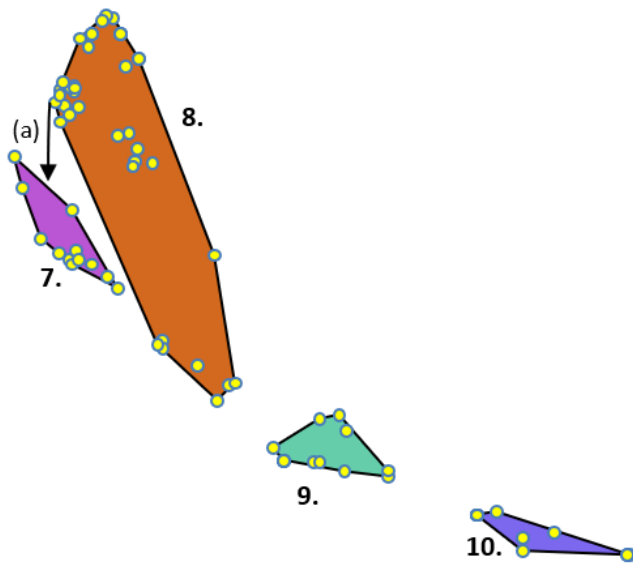
### Clusters

1. Barriers to Access and Social Isolation
2. Need for Health and Social Support Services and Businesses
3. Crescent Town Appearance, Maintenance and Infrastructure
4. Social Disorder and Safety
5. Newcomers and Community Integration
6. (Reframed from Income Insecurity) Areas in Need of City Support

### Statements

- (a) Statement 66 (Cluster 1) moved to Cluster 4  
 (b) Statement 126 (Cluster 1) moved to Cluster 4  
 (c) Statement 12 (Cluster 2) moved to Cluster 4  
 (d) Statement 26 (Cluster 3) moved to Cluster 1  
 (e) Statement 55 (Cluster 3) moved to Cluster 1  
 (f) Statement 56 (Cluster 3) moved to Cluster 1  
 (g) Statement 93 (Cluster 3) moved to Cluster 1  
 (h) Statement 120 (Cluster 3) moved to Cluster 1  
 (i) Statement 122 (Cluster 4) moved to Cluster 1  
 (j) Statement 27 (Cluster 6) moved to Cluster 1  
 (k) Statement 102 (Cluster 6) moved to Cluster 4

Figure 2: Annotated Cluster Map of Neighbourhood Assets as Per Participants' Feedback.



**Clusters**

- 7. (Reframed from Social Belonging and Social Cohesion) Available Support System
- 8. Community and business services
- 9. Natural environment
- 10. Accessibility and security

**Statements**

(a) Statement 168 (Cluster 8) moved to Cluster 7

## Appendix H – Executive Summary of Thesis

### Using Social Media to Engage Toronto Communities for Stress and Resiliency Planning

#### Executive Summary

Martha Ta, MA Community Psychology Candidate & Dr. Ketan Shankardass, Thesis  
Advisor  
Wilfrid Laurier University

#### Background

This study was conducted to use community psychology methods to engage and empower neighbourhood users in Crescent Town, a neighbourhood in East York (Toronto) that we previously identified as a potentially stressful place to live and work. Earlier, we conducted an analysis of the emotions indicated in tweets produced across the City of Toronto over two time periods (2014-13 & 2017-18). We found that there were relatively high levels of emotional stress in social media users in Crescent Town during both time periods. Experiencing chronic stress can lead to negative health outcomes and chronic diseases and can be attributed to characteristics of neighbourhoods. Indeed, administrative data from the City of Toronto indicate that there are relatively high levels of unemployment and social assistance use, as well as relatively low levels of high school graduation, among Crescent Town residents, compared to the rest of the City. Administrative data also indicate that there are relatively high levels of health problems among residents of Crescent Town, including poorer mental health and higher levels of preventable hospitalizations. Finally, the City's Toronto Strong Neighbourhoods Strategy (TSNS) 2020 also recently identified Crescent Town as one of the 31 Neighbourhood Improvement Areas (NIA). As such, the community will receive additional investments to address inequitable differences between neighbourhoods across the City.

#### Study Purpose

The purpose of this study was to use concept mapping with adults who live and work in Crescent Town to articulate the problems currently affecting neighbourhood users, as well as existing assets of the community. The ultimate goal is to use this knowledge to build on existing assets to strategize about solutions (a strengths-based approach) that could improve local conditions, and to help mobilize this knowledge in the community and with other stakeholders.

#### Definitions

- **Stressors** – “events or thoughts that can cause harm or pose threats or challenges” (Baum, 1990, p.660) that may be chronic, “enduring and without a clear ending” (Schetter & Dolbier, 2011, p. 683)

- **Chronic stress** - a prolonged negative emotional state and experience in response to threats, harms or demands (Baum, 1990)
- **Neighbourhood assets** – a person, place, service, business, or group that can be used to improve the quality of a neighbourhood (Berkowitz & Waddud, 2018)
- **Community resilience** – “a process linking a set of networked adaptive capacities to a positive trajectory of functioning and adaptation in constituent populations after a disturbance” (Norris et al., 2008, p.131)
- **Concept mapping** – a methodology that creates maps of ideas generated by stakeholders and through analysis can be used for planning and evaluation (Kane & Trochim, 2007)

## Study Methods

### Phase 1

Aim: to identify Toronto neighbourhoods that are experiencing high levels of chronic stress using social media and pre-existing administrative data provided by the City of Toronto and St. Michael’s Hospital

- Tweets produced by Twitter users that are public and geo-tagged to a location within the city of Toronto were collected and analysed for the emotion of stress. Only the Tweets published during one-year periods of 2013-14 and 2017-18 were collected to indicate neighbourhoods where relatively high levels of stress were being expressed during both periods. We took this to be a possible marker of chronic stress within a community.
- Public sources of data may provide useful insight in potential sources of stress and resilience of neighbourhoods. As such, two data sources, Urban HEART @ Toronto (St. Michael’s Hospital) and Wellbeing Toronto (City of Toronto) were included to identify a group of Toronto neighbourhoods experiencing high levels of chronic stress.

Crescent Town, also known as Taylor-Massey, was selected as one of the Toronto neighbourhoods potentially experiencing high levels of chronic stress as indicated by tweets and administrative data.

### Phase 2

Aim: to engage Crescent Town community members to identify neighbourhood problems contributing to chronic stress and existing neighbourhood assets, and to help empower community members to strategize solutions that may build upon existing assets to reduce chronic stress, and to share that knowledge with community stakeholders across the City of Toronto.

First, participants were recruited to establish a Community Advisory Board (CAB). These participants were members of the neighbourhood as residents, employees, students or volunteers and provided insight on:

- How to recruit a diverse range of perspectives for the aim of Phase 2
- How to share and describe the study's findings and the neighbourhood accurately
- Whether Crescent Town was appropriately identified as one of the Toronto neighbourhoods with high chronic stress as found in Phase 1

Second, participants that were residents, employees, students or volunteers of the neighbourhood were recruited to complete concept mapping over two sessions.

1<sup>st</sup> session:

1. Generation – participants brainstormed existing stressors and assets
2. Structuring – participants grouped responses by similarities and rated responses by importance

Researchers then represented participants' data into a series of visual maps using Concept Systems software.

2<sup>nd</sup> session:

3. Interpretation – participants reviewed the visual maps and provided feedback to adjust the maps
4. Utilization – participants discussed how these results can be shared

As one of the aims of Phase 2, participants also took part in the exercise, 1-2-4-All to practice collaboratively thinking about potential solutions to specific community problems that might build upon existing or desired community assets. This exercise was to demonstrate how the knowledge created by these community users can be mobilized for impact.

## Study Findings

The CAB was made up of three participants, two employees and one resident. Two CAB members also participated in concept mapping. From the discussion with the CAB, it was suggested by one CAB member that they have observed specific stressors being experienced before. Another member suggested that through the nature of their employment, they have experienced neighbourhood members with feelings of stress. Finally, one member suggested that the focus should be on the community's strengths and willingness to address challenges.

A total of 23 participants were recruited to participate in concept mapping. Participants generated 233 statements, including 152 stressors and 81 assets that exist in Crescent Town. This created a map of ten clusters of suggested problems and assets to discuss further.

Figure 1. Cluster rating map generated by participants.

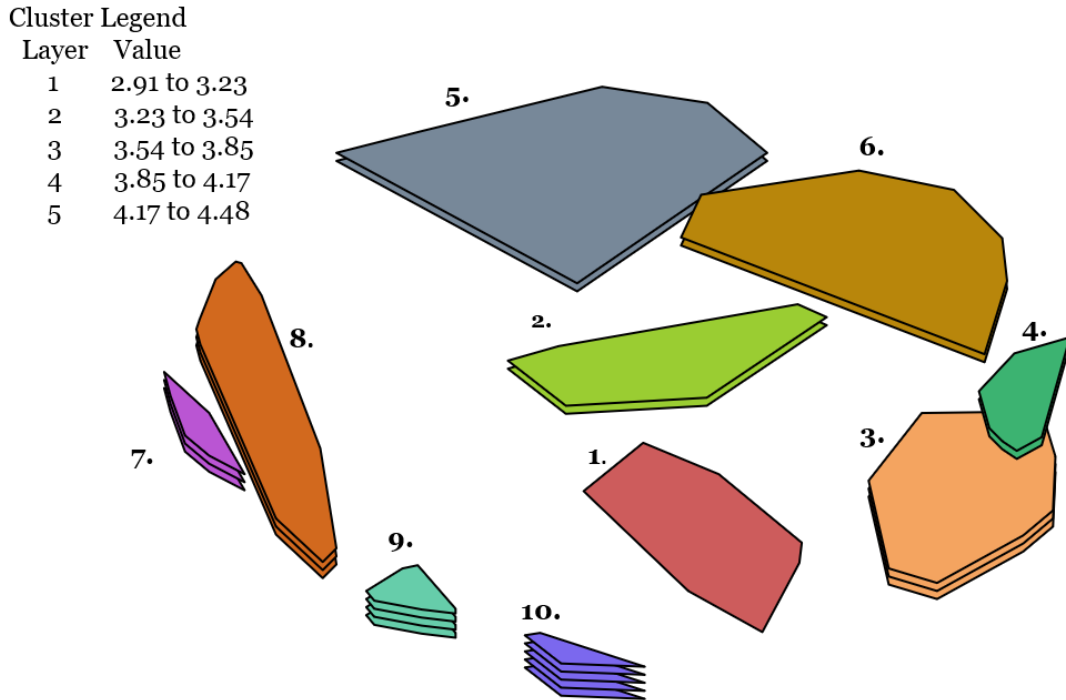


Table 1. Table of Identified Clusters

Cluster	Chronic Stressors	Average Importance Rating
1	Barriers to access and social isolation	2.91
2	Need health or social support services or businesses	3.30
3	Crescent Town appearance, maintenance and infrastructure	3.60
4	Social disorder and safety	3.51
5	Newcomers and community integration	3.31
6	Areas in Need of City Support	3.27
Cluster	Assets	Average Importance Rating
7	Available Support System	3.67
8	Community and business services	3.78
9	Natural environment	4.16
10	Accessibility and security	4.48

Each cluster represents a number of statements that were grouped together by participants. The names of each cluster were first proposed by the researchers and then refined by the participants in the stage of interpretation.

Through the 1-2-4-All exercise, the participants generated two strategies as they focused on two stressors within Cluster 3, Crescent Town Appearance, Maintenance and Infrastructure:

1. A **residents' association** to advocate about building maintenance and accessibility issues to property management and facilitate opportunities for tenants and owners to discuss property concerns
2. **Community fairs** to promote existing neighbourhood resources and to provide networking opportunities for residents to obtain jobs that match their skillset and help them address income needs

### Next Steps

To continue using the community knowledge generated by this study to empower improvements to the condition in Crescent Town, we anticipate:

- Meeting with this study's participants to continue discussing the identified stressors and how to address them

Meeting with the planning team of TSNS 2020 to share the study's findings in order to both reinforce on-going efforts and highlight gaps of the neighbourhood improvement plans

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