NEIGHBOURHOOD SENSE OF PLACE AND AIR QUALITY

VARIATIONS IN SENSE OF PLACE ACROSS IMMIGRANT STATUS AND
GENDER: RELATIONSHIP TO AIR QUALITY PERCEPTIONS AMONGST
WOMEN IN HAMILTON, ONTARIO, CANADA

By MELISSA GALLINA, B.Sc.

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AUTHOR: Melissa Gallina, B.Sc. (McMaster University)

SUPERVISOR: Professor Allison Williams

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ABSTRACT

In the first paper, s*ense of place* (SoP) is used to evaluate immigrant experiences in three small to medium-sized Canadian cites: Hamilton, ON; Saskatoon, SK; and, Charlottetown, PEI. First, quantitative analysis is used to compare *SoP* amongst immigrant and Canadian-born respondents in the three cities. Ordered logistic regression determined four significant predictors of *SoP*: income; age; neighbourhood length of residence and, city of residence. Despite an observed difference in evaluations of *SoP* between immigrants and Canadian-born individuals, regression analysis did not identify immigrant status as a significant predictor of *SoP*.

The second paper employs a mixed-methods strategy to examine individual perceptions of air quality and sense of place amongst Canadian-born and immigrant women in Northeast Hamilton. Furthermore, the study aims to determine the influence of sense of place on local environmental perceptions. Qualitative focus group discussions suggest that Canadian-born women may be more aware, knowledgeable and concerned about large-scale air quality issues; however, the tension between economic and environmental needs hinders their sense of control. Quantitative survey results suggest that Canadian-born residents have a higher absolute value of sense of place than immigrants. Bringing together the qualitative and quantitative data suggests that sense of place may inform environmental perceptions.

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ABBREVIATIONS

CCC: Canadian Chamber of Commerce

CB: Canadian-born

CI: Confidence interval

CIC: Citizenship and Immigration Canada

IM: Immigrant

SoP: Sense of Place

SSHRC: Social Sciences and Humanities Research Council of Canada

DECLARATION OF ACADEMIC ACHIEVEMENT

This thesis is comprised of two articles, which have been submitted and/or accepted for publication. In each paper I, Melissa Gallina, am the primary author. My supervisor, Dr. Allison Williams is the secondary author on both papers.

Chapter 1

Introduction

1.1 Research Context

The following section will provide context for the thesis project by presenting relevant literature and justification for the research. The section addresses two substantive areas, including: immigration in Canada; and, *sense of place*. This research is part of a larger study entitled, *Immigrants' Quality of Life: Relationship to Adaptation in Three Canadian Cities- A Focus on Second and Third Tier Cities*, which was funded by the Social Sciences and Humanities Research Council of Canada (SSHRC), SSHRC Immigration and the Metropolis. This larger research project focused on issues related to immigrant quality of life in Charlottetown, Prince Edward Island; Hamilton, Ontario; and, Saskatoon, Saskatchewan. Contextual information about each of the sites is provided in Chapter 2 (Sections 2.3.2 & 2.4.1).

Quality of life is defined as "the degree to which a person enjoys the important possibilities of his or her life" (Raphael et al., 1995, 229). The goal of this larger research project was to inform the development of pan-Canadian research, policy and practice that addresses the successful integration and adaptation of immigrants in small and medium-sized Canadian cities. Selected

results from the larger research project are presented later in this introductory chapter (Section 1.2.2).

1.2 Immigration in Canada

Canada remains one of the world's most popular immigrant destinations (CIC, 2013). Consequently, immigration plays an important role in the development of Canada's economy, society, and history (CIC, 2013). Each year, Canada welcomes approximately 250,000 permanent residents and 200,000 temporary foreign workers and international students (CIC, 2011). In recent years, Canada has had a per capita immigration rate of 0.8%, representing one of the highest rates in the world (CIC, 2011).

It is widely acknowledged that Canada, similar to many other industrialized countries, is experiencing a declining fertility rate and an aging population (Canadian Chamber of Commerce, 2009; Green, 2003; Fougère et al., 2004). Immigration is recognized as a potential solution to compensate for lower fertility rates and to address labour force shortages (CCC, 2009; Green, 2003; Fougère et al., 2004). Another goal of Canadian immigration policy is to increase the stock of human capital and thus increase the pool of skills available to Canadian employers (Green, 2003). The final goal of Canadian immigration policy is to encourage economic growth in smaller centres (Green, 2003; Green and Green, 1999). It is suggested that immigrants provide the necessary labour and skills that these areas require to grow (Green, 2003; Green and Green, 1999).

1.2.1 Immigration in Second and Third-tier Canadian Cities

The majority of research on immigration in Canada focuses on the settlement of immigrants in Canada's three largest cities: Toronto, Vancouver and Montreal (Frideres, 2006; Radford, 2007). Approximately 75% of all immigrants to Canada reside in one of these first-tier cities, compared to just over 25% of Canadian-born individuals (Frideres, 2006; Radford, 2007). The majority of immigrants who settle in Toronto, Vancouver or Montreal do so in order to live near friends and family (Halliday, 2006). Those who settle outside of these three cities tend to place greater emphasis on employment opportunities during their settlement choice (Halliday, 2006). Frideres (2006) notes that an increasing proportion of new immigrants are choosing to settle in second and third-tier Canadian cites. Therefore, there has been a call for greater research on immigration in Canada's second and third-tier cities (Radford, 2007).

Krahn et al. (2005) define a second-tier city as a smaller urban centre outside Canada's three largest cities which has: a population greater than 500,000, a diversified economy, a fair amount of ethnic and cultural diversity, and a large range of services for immigrants. In comparison, third-tier cities have populations under 500,000; immigrant services, employment opportunities, and diversity are limited (Krahn et al., 2005). Among those who decided to leave a smaller city for a larger city, reasons for relocating included: greater employment opportunities, greater post-secondary educational opportunities, better quality of life, living

closer to family, friends or an ethnic community, and increased access to settlement services (Krahn et al., 2005).

1.2.2 The Immigrant Experience

Immigrants in Canada face a number of unique barriers regarding income, education, and employment, hindering their quality of life. For example, recent immigrants are more likely to be classified as 'low income', when compared to their Canadian-born counterparts (Heisz and McLeod, 2004; Sharpe, 2011). Despite the large number of immigrants with post-secondary education; there remains a high proportion of the immigrant population with low educational attainment (Klassen and Burnaby, 1993; Statistics Canada, 2008). Compared to Canadian-born individuals, immigrants to Canada have higher rates of unemployment (Sharpe, 2011). Immigration policy and settlement patterns; adjustment to the labour market over time; devaluation of foreign qualifications, and the potential for discrimination are all recognized as determinants of immigrant employment success (Reitz, 2007). With a longer length of residence in Canada, immigrants often face fewer settlement problems due to the development of social and community relationships, increased language proficiency and better economic conditions (Setia et al. 2011).

Research from the larger SSHRC Metropolis project found that income was the only significant predictor of immigrant quality of life (Williams et al., *submitted* b). However, it is acknowledged that income is intimately related to other factors, such as employment, education, language skills, and length of

residence in Canada (Williams et al., *submitted* b). Overall, immigrants had lower evaluations of quality of life compared to Canadian-born individuals in the three cities studied (Williams et al., *submitted* a).

1.3 Sense of Place

The Dictionary of Human Geography defines *sense of place* as "the attitudes and feelings that individuals and groups hold *vis-à-vis* the geographical areas in which they live. It further commonly suggests intimate, personal and emotional relationships between self and place" (Wylie, 2009, 676). In other words, *sense of place* has been defined as "a geographic concept intended to describe the particular ways in which human beings invest their surroundings with meaning" (Williams et al., 2010, 906). The concept of *sense of place* follows the humanistic tradition within human geography, evident in its focus on individual experiences of place (Eyles, 1985; Butz and Eyles, 1997). Lewis (1980) recognizes a *sense of place* as a basic human need. According to Relph (1997), *sense of place* is an 'innate faculty' contained within all people. As such, *sense of place* connects individuals to the physical world and is an important part of our environmental experience (Relph, 1997). Furthermore, *sense of place* is recognized as a dynamic construct, which varies over time and across cultures (Steele, 1981; Relph, 2008).

1.3.1 Meanings of Place

In order to fully appreciate the concept of a *sense of place*, one must understand its foundation, 'place'. Generically, a place is defined as "a

geographical locale of any size or configuration, comparable to equally generic meanings of area, region or location" (Henderson, 2009, 539). However, within the field of human geography, a 'place' is attributed a higher level of meaning due to human investment and experience (Henderson, 2009). Place "refers to space that has been given meaning through personal, group, or cultural processes" (Low and Altman, 1992, 5).

The following quotes from a review by Brown and Perkins (1992) conceptualize this greater significance associated with the meaning of 'place'. According to Cochrane (1987), "Place… means permanence, security, nourishment, a center or organizing principle" (11); "place is currently understood less as a physical location than a deeply affective characterization crystallized from an individual's emotions, experience and cultural background." [There is a] "reciprocal relationship between individuals and place, an interlocking system in which the people and place define one another" (7). Eyles (1989) further defines place as "a centre of felt value, incarnating the experience and aspirations of people. Thus it is not only an arena for everyday life… [it also] provides meaning to that life" (109). Steele (1981) acknowledges that place provides individuals and groups with a sense of security: "a feeling that they are at home or have a home that they can go back to, which provides a sense of control over their own fate" (7).

1.3.2 Sense of Place: A Background

The term *"genius loci"*, meaning "spirit of place" in Latin, is often recognized as the precursor to *sense of place* (DeMiglio and Williams, 2008). The Romans believed that specific spaces were guarded by sacred spirits, giving the place a unique identity (Lewis, 1980; Jackson, 1994; Relph, 2008). This intangible quality, which adds meaning to certain places, is still recognized today (Lewis, 1980). The term "spirit of place" is now used to describe secular characteristics, which contribute to the identity of a place (Relph, 2008). Relph (2008) acknowledges that *sense of place* and spirit of place are related; however, there is a clear distinction between the two terms. Spirit of place exists primarily outside of the individual, while *sense of place* comes primarily from within the individual (Relph, 2008). *Sense of place* is an interactional concept, which focuses on individual experiences; spirit of place refers to the feeling or personality of a place (Steele, 1981).

According to DeMiglio and Williams (2008), one of the earliest references to *sense of place* comes from the National Academy of Sciences Report of the Ad Hoc Committee on Geography in 1965. This group of American geographers defined *sense of place* as "a compound of a sense of 'territoriality', physical direction, and distance [that] is very deeply ingrained in the human race" (National Academy of Sciences, 1965, 7). It is further suggested that *sense of place* is an innate human characteristic, which "undoubtedly existed in earliest man" (National Academy of Sciences, 1965).

Sense of place is recognized as a versatile construct; as such, *sense of place* is employed across an increasing number of disciplines, including psychology, architecture, and sociology (Relph, 1997; DeMiglio and Williams, 2008). For geographers, *sense of place* is seen as an environmental connection, which links individuals with their surroundings (Relph, 1997). A geographical *sense of place* allows for: interpretation of the environment; identification of elements of place; and, understanding of the interaction between individuals and their environment (Relph, 1997).

1.3.3 Perceptions of Environment and Place

Past research suggests that *sense of place* may influence individual environmental perceptions (Vorkinn & Riese, 2001). Environment perception refers "to the myriad of ways in which actors (usually human) perceive, engage with and symbiotically represent environments… perception should be understood in the widest sense, referring to both the bio-psychological idiosyncrasies of individual sensing, and the issue of collective cultural beliefs, values and aesthetic judgments concerning natural and built environments" (Wylie, 2009, 202). "Perception of the environment requires man to interpret the physical and social components of his stimulus field" (Beck, 1967, 18); as such, "subjective, often unconscious and culturally dominated forces play a major role in how we see the environment" (Lowenthal, 1967, 1).

Some studies suggest that individuals with higher levels of *sense of place* are more likely to: have negative attitudes towards development causing

environmental harm; be more committed to solving problems associated with local environmental issues; and, remain in the area to fight an environmental threat (Vorkinn & Riese, 2001; Kaltenborn, 1998; Bonaiuto et al., 1996). Conversely, studies have also identified a 'neighbourhood halo effect' where individuals are reluctant to acknowledge local pollution or its negative impacts due to a strong commitment to place (Bickerstaff & Walker, 2001; Bush et al., 2001; Vaske & Kobrin, 2001; Bonaiuto et al., 1996).

1.3.4 Immigrant Attachment to Place

Place attachment, a psychological construct closely linked to *sense of place*, is defined as "the affective link that people establish with specific settings, where they tend to remain and where they feel comfortable and safe" (Hernández et al., 2007, 310). According to Vaske and Kobrin (2001), environmental psychology's concept of *place attachment* is consistent with the meaning of *sense of place* in human geography. Both terms describe the process of human bonding to the physical environment, focusing on positive cognitions related to a specific geographical location (Vorkinn & Riese, 2001).

Place attachment is recognized as having a number of important functions, such as: allowing individuals to form relationships; linking individuals to religion and culture; and, fostering a sense of community (Low and Altman, 1992). Place attachment is known to develop slowly over time but can be quickly disrupted (i.e. through immigration) (Brown and Perkins, 1992; Demiglio and Williams, 2008). The disruption of place attachment is associated with stress and loss as

individuals attempt to rebuild attachments (Brown and Perkins, 1992). The amount of difficulty experienced during the disruption process is related to the level of pre-disruption attachment and the degree of voluntariness of relocation (Brown and Perkins, 1992).

1.4 Research Objectives

The objectives of this thesis project are to:

I.   Establish measures and determinants of *sense of place* across immigrant status and gender in Hamilton, Saskatoon, & Charlottetown;

II.   Compare air quality perceptions and associated coping strategies between immigrant and Canadian-born women in Hamilton; and,

III.   Determine if evaluations of *sense of place* inform perceptions of air quality among these women.

1.5 Study Overview

This thesis project is comprised of two research papers, both of which have been submitted and/or accepted for publication. The first paper (Chapter 2), *Variations in Sense of Place across Immigrant Status and Gender in Hamilton, Ontario; Saskatoon, Saskatchewan; and, Charlottetown, Prince Edward Island, Canada*, uses quantitative analysis to satisfy objective I, above. The second paper (Chapter 3), *Perceptions of Air Quality and Sense of Place among Immigrant and Canadian-born Women in Northeast Hamilton, Ontario, Canada*, uses a mixed-

methods approach to satisfy objectives II and III. Chapter 4 provides overall conclusions, limitations, and opportunities for further research.

Past research in Hamilton, Ontario has found that age and longevity of residence are positively associated with evaluations of *sense of place*; further, evaluations of *sense of place* between immigrants and Canadian-born individuals have shown no clear pattern (Williams et al. 2010; Williams & Kitchen 2012). The first paper builds on this work by further examining evaluations of *sense of place* among both immigrants and Canadian-born residents, and across gender in Hamilton, while expanding the study to two other small-to-medium sized cities: Saskatoon, Saskatchewan and, Charlottetown, Prince Edward Island. As mentioned above, there is a growing need to investigate immigrant experiences in smaller centers; *sense of place* is used to describe the immigrant experience in these three cities. Information about *sense of place* provides insight into the emotional attachments immigrants have established with their new home, providing a rationale for this research. It is reasoned that a strong *sense of place* may assist in the adaptation process of immigrants. Additionally, individual perceptions of place have been related to health and wellbeing (DeMiglio and Williams, 2008; Williams and Kitchen, 2012), thus providing important information about the immigrant experience.

Within this paper, there are two secondary objectives: (a) to establish measures of *sense of place* across immigrant status and gender in Hamilton, Saskatoon, and Charlottetown; and, (b) to determine how *sense of place* varies

according to immigrant status, length of residence in Canada, age, income, and neighbourhood length of residence across the three city sites. Telephone survey data (n=1132) was used to compare evaluations of *sense of place* across various groups and to construct an ordered logistic regression model for *sense of place* using a 16-item *sense of place* scale (Williams et al., 2010).

The second paper uses the environmental stress and coping framework to examine individual perceptions of air pollution amongst Canadian-born and immigrant women in Northeast Hamilton. Research on environmental health risks suggests that white males tend to rate risks lower than all other groups (white women and non-whites), providing a rationale for this research (Flynn et al., 1994; Finucane et al., 2000). According to the postmaterialist thesis, the environmental perceptions of immigrants might differ from that of the dominant social group (Lovelock et al., 2013). The postmaterialist thesis suggests that individuals from richer, more developed countries have higher levels of environmental concern than those from poorer, less developed countries (Inglehart, 1995; Lovelock et al., 2013). The postmaterialist thesis reasons that individuals residing in developing countries are preoccupied with meeting basic needs; and therefore are less concerned about the environment (Inglehart, 1995; Lovelock et al., 2013). However, it is suggested that immigrants from less developed countries may experience increased levels of environmental concern once they become settled in a more developed country (Inglehart, 1995; Lovelock et al., 2013). Furthermore, women exhibit greater concern for environment and

health compared to men, due to their traditional role as caregivers (Stern et al., 1993; Momsen, 1999).

This paper also explores whether perceptions of air quality and chosen coping strategies are informed by individual evaluations of *sense of place*, providing a connection to the first paper. The *sense of place* scale introduced in the first paper contains a question relating to local environmental perceptions: *Environmental problems in my neighbourhood (e.g. air pollution, run-down buildings) negatively influence my health. (#D7)*. The focus group discussions serve to provide further context around this question, and the influence of environmental problems (i.e. air pollution) on overall *sense of place.* The physical environment is largely absent in *sense of place* literature, providing further rationale for this study (Stedman, 2003).

There are three secondary objectives associated with this paper: (a) to compare perceptions of air quality between immigrant and Canadian-born women; (b) to investigate coping strategies associated with poor air quality among these two groups; and, (c) to determine if evaluations of *sense of place* inform perceptions of air quality.

Prior to undertaking the data collection for the second paper, seven key informant interviews were completed. Key informants for this research project included those familiar with the issues surrounding air quality in Northeast Hamilton and/or, those involved with a local community organization. Key

informant interviews were used to gain contextual information about air quality and neighbourhood characteristics and, to review topics to be addressed in the community focus groups.

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Chapter 2

Variations in Sense of Place across Immigrant Status and Gender in Hamilton, Ontario; Saskatoon, Saskatchewan; and, Charlottetown, Prince Edward Island, Canada

2.1 Abstract

Past research in Hamilton, Ontario has found that age and longevity of residence are positively associated with evaluations of *sense of place*; further, evaluations of *sense of place* between immigrants and Canadian-born individuals have shown no clear pattern (Williams et al. 2010; Williams & Kitchen 2012). This paper builds on this work by further examining evaluations of *sense of place* among both immigrants and Canadian-born residents and across gender in Hamilton, while expanding the study to two other small-to-medium sized cities: Saskatoon, Saskatchewan and, Charlottetown, Prince Edward Island. This paper has two objectives: (1) to establish measures of *sense of place* across immigrant status and gender in Hamilton, Saskatoon, and Charlottetown; and, (2) to determine how *sense of place* varies according to immigrant status, length of residence in Canada, age, income, and neighbourhood length of residence across the three city sites. Telephone survey data (n=1132) was used to compare evaluations of *sense of place* across various groups and to construct an ordered logistic regression model for *sense of place*. Results suggest that immigrants

tended to rate their *sense of place* lower than their Canadian-born counterparts. Hamilton residents were found to rate their *sense of place* lowest, followed by Saskatoon residents and, finally, Charlottetown residents. Younger individuals, those with lower income levels, and those with shorter neighbourhood residency in the cities concerned were more likely to have lower evaluations of *sense of place*. This research suggests that greater attention is needed to nurture immigrants' connection with their new home.

Keywords: Sense of place; Immigrants; Canada; Small-to-medium sized cities; Gender

2.2 Introduction

Canada remains a popular destination for immigrants (CIC 2011), with the majority settling in Canada's three largest cities: Toronto, Vancouver, and Montreal (Frideres 2006; Radford 2007). However, there is an increasing number of immigrants settling in smaller Canadian cities, which suggests a need to explore immigrant experiences in these smaller centres (Frideres 2006; Radford 2007). Sense of place (SoP) has been defined as "the attitudes and feelings that individuals and groups hold *vis-à-vis* the geographical areas in which they live. It further commonly suggests intimate, personal and emotional relationships between self and place" (Wylie 2009 676). As such, SoP will be used to evaluate the immigrant experience in three small-to-medium sized cities. Information about SoP provides insight into the emotional attachments immigrants have

established with their new home, providing a rationale for this research. It is reasoned that a strong SoP may assist in the adaptation process of immigrants. Additionally, individual perceptions of place have been related to health and wellbeing (DeMiglio and Williams, 2008; Williams and Kitchen, 2012), thus providing important information about the immigrant experience.

This paper has two objectives: (1) to establish measures of SoP across immigrant status and gender in Hamilton, Saskatoon, and Charlottetown; and, (2) to determine how SoP varies according to immigrant status, length of residence in Canada, age, income, and neighbourhood length of residence across the three city sites. As such, this paper adds to current literature on SoP in the three cities. This paper builds on previous work by further examining evaluations of SoP among both immigrants and Canadian-born residents and across gender in Hamilton, while expanding the study to two other small-to-medium sized cities: Saskatoon, Saskatchewan and, Charlottetown, Prince Edward Island. The rationale for expanding the study to Saskatoon and Charlottetown is to determine if the results found in previous studies conducted in Hamilton apply in other Canadian cities. With this addition, the study contains cities from each of the three major geographical regions of Canada: Western, Central, and Atlantic. It is noted that the cities chosen constitute a convenience sample, and not a random sample of cities within each region.

This paper begins with a review of the literature surrounding: immigration in Canada; contextual information on each of Hamilton, Saskatoon, and

Charlottetown; and, neighbourhood SoP in the three city sites. Next, the data and methods of analysis are discussed. Analysis was conducted using an established SoP formula (Williams et al. 2010) and ordered logistic regression modelling. Results are presented using graphs and tables. A discussion of results is provided, which acknowledges the limitations of this study. Finally, this paper presents a conclusion, which includes policy recommendations to increase immigrant SoP.

2.3 Literature Review

2.3.1 Immigration in Canada

Canada is a country that was built by immigrants and continues to be a popular immigrant destination today (CIC 2011). Each year, Canada absorbs approximately 250,000 permanent residents and 200,000 temporary foreign workers and international students (CIC 2011). In recent years, Canada has had a per capita immigration rate of 0.8%, representing one of the highest rates in the world (CIC 2011). Approximately 75% of all immigrants to Canada reside in Toronto, Vancouver, and Montreal (Frideres 2006; Radford 2007). In comparison, just over 25% of Canadian-born individuals reside in one of Canada's three largest cities (Frideres 2006). A goal of the Canadian immigration policy is to encourage economic growth in smaller centres (Green 2003; Green and Green 1999). It is suggested that immigrants provide the necessary labour and skills that these areas require to grow (Green 2003; Green and Green 1999). As mentioned above, a greater number of immigrants are settling in smaller Canadian cities, providing the rationale to study the immigrant experience in these sites (Frideres

2006; Radford 2007). For the purpose of this study, immigrant status is defined by location of birth; where immigrants are defined as those not born in Canada.

2.3.2 Site Context

Hamilton, Ontario is located in central Canada, with industry focused on services and manufacturing (Statistics Canada 2007b). The population of Hamilton is 519,949 (Statistics Canada 2012b), including 3,296 immigrants (CIC 2011). Saskatoon, Saskatchewan, located in western Canada, has a population of 234,000 (City of Saskatoon 2011), including 3,796 immigrants (CIC 2011). Farming and mining are the primary industries in Saskatoon (City of Saskatoon 2011). Located in eastern Canada, Charlottetown's industry is focused on services and retail trade (Statistics Canada 2007a). The population of Charlottetown is 34,562 (Statistics Canada 2012a), 1,665 of which are immigrants (CIC 2011).

2.3.3 Sense of Place

SoP has been related to a number of similar constructs, including: place attachment, sense of community, community satisfaction, and place identity. This research focuses on SoP, which reflects the experiences and perceptions of the residents themselves (Williams et al. 2010). In comparison, other place-related concepts, such as place identity, are informed by external views and stereotypes (Williams et al. 2010). Place attachment, an environmental psychology measure, focuses more heavily on psychological understandings, and less on place-based understandings (Williams et al. 2010). Of the aforementioned terms, SoP

describes the purest geographical understanding of the relationship between people and place (Williams et al. 2010).

A select number of studies have examined SoP in Hamilton, Saskatoon, and Charlottetown. A study conducted by Williams et al. (2010) investigated the influence of neighbourhood socio-demographic characteristics on evaluations of SoP in Hamilton. SoP was stronger among residents of a higher income neighbourhood than residents of a lower income neighbourhood (Williams et al. 2010). Both neighbourhood length of residence and age were significant predictors of SoP, indicating an increased SoP over time (Williams et al. 2010). Gender and household income were not found to influence evaluations of SoP (Williams et al. 2010). Interestingly, immigrant respondents were found to have a higher SoP than Canadian-born respondents (Williams et al. 2010). In 2012, Williams and Kitchen conducted a follow-up study of SoP in Hamilton. Again, it was found that higher SoP was related to: higher socioeconomic status; older age; and, long-term neighbourhood residency (Williams and Kitchen 2012). Confirming previous results, gender was not a significant predictor of SoP (Williams and Kitchen 2012). In contrast to previous results, immigrant status was found to influence SoP, with immigrants having lower evaluations of SoP compared to Canadian-born individuals (Williams and Kitchen 2012).

Williams and colleagues (2008) also examined SoP in Saskatoon between 2001 and 2004. Evaluations of SoP were based on four variables: "(1) feeling part of the neighbourhood; (2) comfort in participating in neighbourhood projects; (3)

calling on neighbours in a crisis; and, (4) volunteering for organizations"
(Williams et al. 2008 17). Long-term neighbourhood residency; participating in
volunteerism; and, perceptions of neighbourhood friendliness were found to be
significant positive influences on SoP (Williams et al. 2008). Overall, SoP was
found to be higher in 2001 than in 2004 (Williams et al. 2008). There is
comparatively little research on SoP in Charlottetown, however, it has been
suggested that island communities foster a 'unique' SoP due to their physical
geography (Baldacchino 2005).

2.4 Methods

2.4.1 Data Summary

Data for this project was obtained from a telephone survey (n=1132)
conducted in the summer of 2012, as part of a larger quality of life study funded
by the Social Sciences and Humanities Research Council of Canada, SSHRC
Immigration and the Metropolis (Table 1). The quality of life survey addressed a
number of topics, including: health, social capital and, environmental problems.
In addition, the survey contained a 16-item SoP scale. As shown in Table 1,
approximately 75% of survey respondents were born in Canada, while 25% are
immigrants. Survey respondents are split between both genders. The greatest
proportion of respondents resides in Hamilton, followed by Saskatoon and
Charlottetown, reflecting the relative size of each of the cities. Sample size, for
both the number of households and the size of the immigrant population, were
informed by the 2006 census. Households were randomly selected in each of the

three cities. All immigrants, regardless of period of residency, were targeted for the survey. As part of the larger study, a series of tests comparing the sample to the 2006 census were carried out to verify the accuracy of the overall survey sample (Williams et al., *submitted*). The comparisons indicated a high degree of accuracy with respect to various socio-demographic characteristics for immigrants (Williams et al., *submitted*).

Table 1: Data Summary

	Immigrant Status				Gender				TOTAL (n=1132)	
	Canadian-born		Immigrant		Male		Female		All Sample	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Charlottetown	191	85.7	32	14.4	99	44.4	124	55.6	223	19.7
Hamilton	351	67.1	172	32.9	226	43.2	297	56.8	523	46.2
Saskatoon	305	79.0	81	21.0	203	52.6	183	47.4	386	34.1
TOTAL (n=1132)	847	74.8	285	25.2	528	46.6	604	53.4	1132	100

The SoP scale, established by Williams et al. (2010), focuses on four areas: neighbourhood rootedness; neighbourhood sentiment; neighbours; and, environment and health, each of which is made up of four questions (See Table 2). Data for each of the sixteen items was collected using a 5-point likert scale and was later coded to represent values between one and five (Williams et al. 2010). Values of one represent the most positive responses and values of five represent the most negative responses (Williams et al. 2010). As an exception, three of the environment and health questions (D7, D8 and D9) were reverse coded, as these

questions refer to negative influences of SoP (Williams et al. 2010). This was done in order to ensure consistency with the other questions, which reflect positive influences on SoP (Williams et al. 2010).

Table 2: 16-item Sense of Place Scale (Williams et al. 2010)[a]

The following statements and questions have to do with your feelings about your neighbourhood. *For each, indicate the degree to which you agree or disagree.*				
D1. My neighbourhood means a great deal to me.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D2. There's no other neighbourhood I would rather live.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D3. I feel at home in my neighbourhood.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D4. There are people in my neighbourhood who I think of as close friends.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D5. I would like to stay in my neighbourhood as long as my health allows me to do so.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D6. Green space availability in my neighbourhood positively influences my health.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D7. Environmental problems in my neighbourhood (e.g. air pollution, run-down buildings) negatively influence my health.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D8. Social problems in my neighbourhood (e.g. racism, violence) negatively influence my health.				
1 (Strongly	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly

agree)				disagree)
D9. The personal safety of myself and my family in my neighbourhood negatively affects my health				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
How true are the following two statements?				
D10. I know many of my neighbours on a first name basis.				
1 (Very true)	2 (Fairly true)	3 (Neutral)	4 (Not very true)	5 (Not at all true)
D11. If I were to live somewhere else, it would be difficult to move away from my neighbourhood.				
1 (Very true)	2 (Fairly true)	3 (Neutral)	4 (Not very true)	5 (Not at all true)
I would like to ask you several more questions on how you feel about your neighbourhood.				
D13. How rooted do you feel in your neighbourhood?				
1 (Very rooted)	2 (Fairly rooted)	3 (Neutral)	4 (Not very rooted)	5 (Not at all rooted)
D14. How connected do you feel to your neighbourhood?				
1 (Very connected)	2 (Fairly connected)	3 (Neutral)	4 (Not very connected)	5 (Not at all connected)
D15. How much do you like your neighbourhood?				
1 (A great deal)	2 (A fair amount)	3 (Neutral)	4 (Not very much)	5 (Not at all)
D16. How often do you participate in social activities with your neighbours (e.g barbeques, coffee dates, etc.)				
1 (All the time)	2 (Often)	3 (Sometimes)	4 (Hardly ever)	5 (Never)
D17. If you had to leave your neighbourhood, how many of your neighbours would you miss?				
1 (Many of them)	2 (Some of them)	3 (Neutral)	4 (Hardly any of them)	5 (None of them)

[a] *Factors*

Neighbourhood rootedness=D2+D13+D5+D11

Neighbourhood sentiment=D1+D3+D14+D15

Neighbours=D10+D16+D4+D17

Environment and health=D6+D7+D8+D9

2.4.2 Analysis

Analysis for this paper took place in two phases. The first phase of the analysis aimed to determine if there was a significant difference in evaluations of SoP based on city of residence, immigrant status, and gender. Data from each of the three sites was imported into SAS and merged into a single data file. Any records with a missing response to one of the sixteen SoP questions were eliminated from the analysis. Individual evaluations of neighbourhood SoP were calculated using an equation (below) established by Williams et al. (2010). The equation is the result of a principal components analysis using 46 variables that have been found to influence neighbourhood SoP (Williams et al. 2010). As shown in Table 2, the 16-item survey is divided into four factors with each factor containing four questions (Williams et al. 2010).

$$Neighbourhood\ SoP$$
$$= \left[\frac{(20 - \Sigma Factor1) + (20 - \Sigma Factor2) + (20 - \Sigma Factor3) + (20 - \Sigma Factor4)}{64} \right]$$
$$\times\ 100$$

The sum of each factor can range from a low of 4, which indicates a positive evaluation of SoP, to a high of 20, which indicates a weak SoP (Williams and Kitchen 2012). In order to prevent confusion, the values were reversed by subtracting the sum from 20 (Williams and Kitchen 2012). In doing so, the possible outcomes range from 0 (lowest possible SoP) to 16 (highest possible SoP) (Williams and Kitchen 2012). Finally, the four sums are divided by 64 (the

highest possible score) to obtain a percentage (Williams and Kitchen 2012). Values close to 100 represent a strong SoP (Williams and Kitchen 2012). An example is provided below using the data from the first Charlottetown respondent.

$$Neighbourhood\ SoP = \left[\frac{(20-10)+(20-7)+(20-13)+(20-8)}{64}\right] \times 100 =$$

$$\left[\frac{(10+13+7+12)}{64}\right] \times 100 = 65.6$$

SoP was compared (i) between immigrants and Canadian-born individuals; (ii) between the three cities; and, (iii) between males and females. An average value of SoP was calculated for each of these groups. In order to determine if evaluations of SoP differ significantly, 95% confidence intervals were calculated for the mean SoP. An assumption of normality was made for the dataset, since both skewness and kurtosis were close to zero (Delwiche and Slaughter 2008).

The second phase of analysis involved the creation of an ordered logistic regression model to predict SoP using the following independent variables: immigrant status, city of residence, length of residence in Canada, income class, age category and neighbourhood length of residence. In order to conduct an ordered logistic regression, four categories of SoP were created. A standard Z-score was calculated for each individual based on their raw SoP score. The resulting Z-scores were used to create four SoP categories (Table 3).

Table 3: Z-scores for SoP Categories

Z-score	Sense of place
$Z \geq 1$	High
$< 1\ Z > 0$	Above average
$< 0\ Z > -1$	Below average
$Z \leq -1$	Low

In order to further investigate factors affecting SoP within each of the cities, attempts were made to stratify the sample and create separate models for each of the three cities. The models for Saskatoon and Charlottetown were not statistically significant, due to the small sample size in these two cities.

2.5 Results

Results will be presented in each of the two phases addressed in the methods section. During phase one, confidence intervals were used to determine if there was a significant difference in evaluations of SoP across groups. The scatterplots below (Figures 1-3) display the mean SoP, confidence limits (95%) and error bars. First, SoP was compared between immigrants and Canadian-born individuals across all three sites. As shown in Figure 1 (below), Canadian-born individuals had an average SoP of 67.55 CI(66.53-68.57) and immigrants had an average SoP of 63.43 CI(61.86-65.00). At a 95% level of confidence, the means for immigrants and Canadian-born individuals are significantly different.

Figure 1: Sense of Place by Immigrant Status
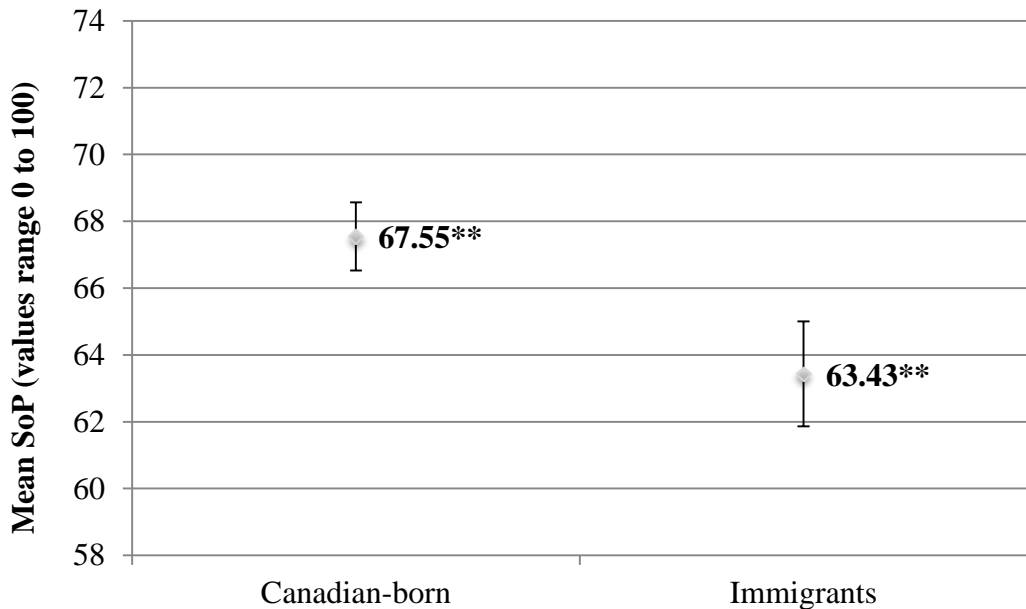
**statistically significant difference at the 95% confidence level

Next, SoP was compared between the three sites. As shown in Figure 2 (below), respondents from Charlottetown had an average SoP of 71.05 CI(69.26-72.84), respondents from Hamilton had an average SoP of 64.14 CI(62.83-65.45), and respondents from Saskatoon had an average SoP of 66.96 CI(65.53-68.39). At a 95% confidence level, the mean for Charlottetown was significantly different from that of both Hamilton and Saskatoon. The means for Hamilton and Saskatoon are also significantly different at a 95% confidence level; however, this should be interpreted with caution as the confidence intervals are very close to overlapping.

Figure 2: Sense of Place by City of Residence
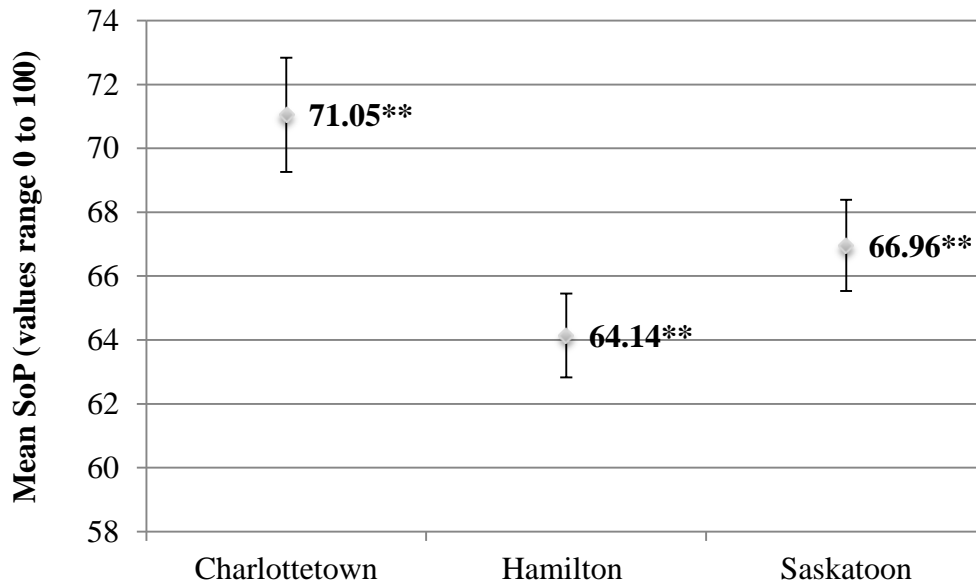
**statistically significant difference at the 95% confidence level

Finally, SoP was compared across gender. As shown in Figure 3, males and females report very similar levels of SoP, 66.21 CI(64.93-67.49) and 66.67 CI(65.51-67.84) respectively. Therefore, there is not a significant difference in evaluations of SoP across gender.

Figure 3: Sense of Place by Gender

-no statistically significant different at the 95% confidence level
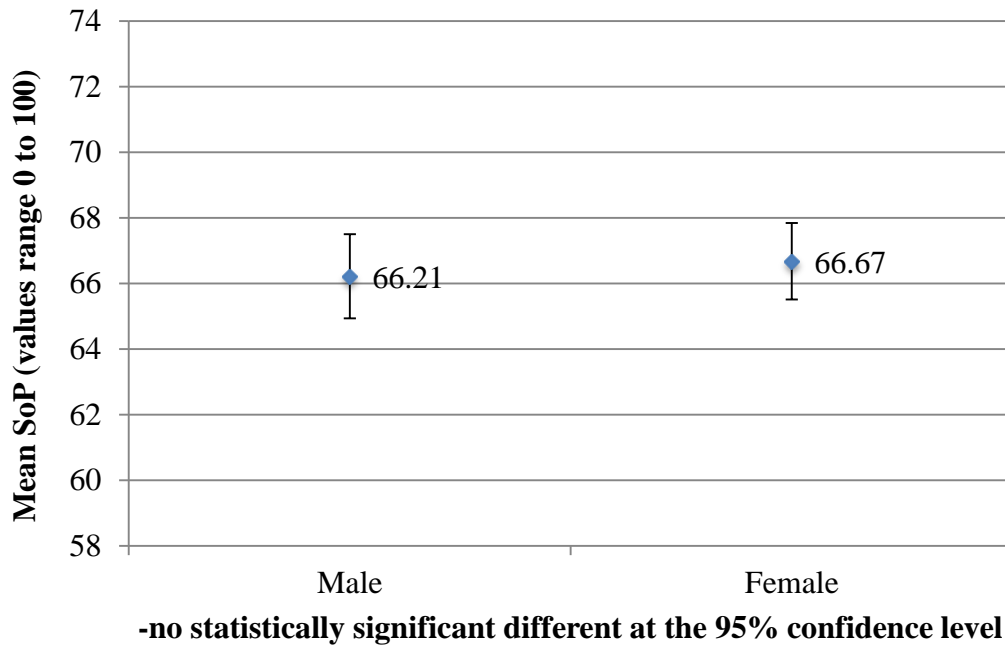
In phase two, ordered logistic regression was used to identify significant predictors of SoP for the whole sample. Figure 4 displays the distribution of respondents (n=1132) according to the four categories of SoP. The majority of respondents reported an "above average" SoP (35.5%) or a "below average" SoP (30.3%). A smaller proportion of respondents reported a "high" or "low" SoP (17.2% and 16.9% respectively).

Figure 4: Descriptive Statistics, Sense of Place
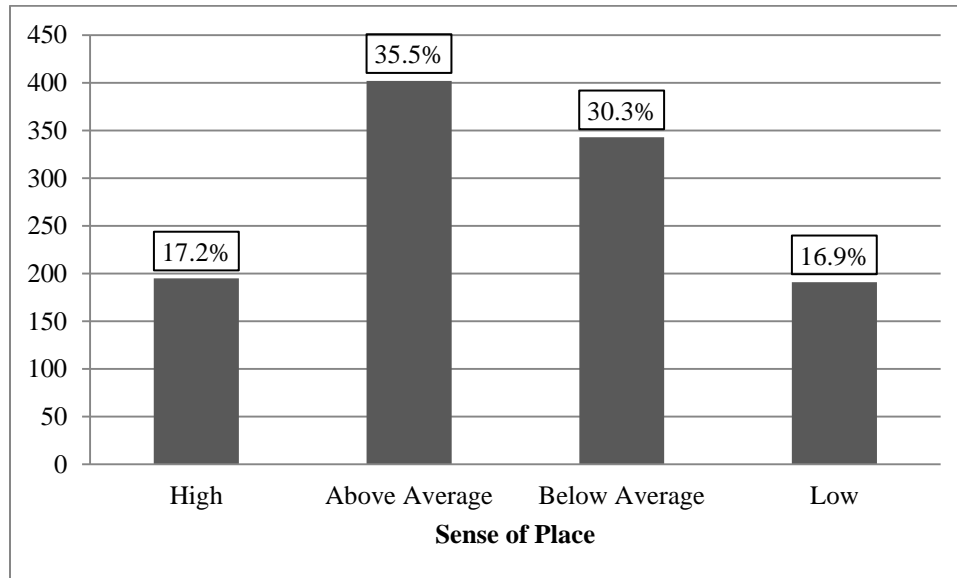
Significant predictors of SoP ($p < 0.05$) were found to be: city of residence; income; age; and, neighbourhood length of residence, all of which are highlighted in Table 4. Compared to residents of Saskatoon, residents of Hamilton are 1.6 times more likely to rate their SoP as "low" (closer to a value of 1 for the dependent variable). Residents of Charlottetown are 0.8 times less likely to rate their SoP as "low" when compared to those living in Saskatoon (close to statistical significance). Compared to the highest income class ($100,000+), individuals in the lower income categories are 1.4 to 2.2 times more likely to rate their SoP as "low". Individuals under age 65 are 1.7 to 3.4 more likely to rate their SoP as "low" compared to those in the highest income category. Finally, those with shorter lengths of neighbourhood residence are 1.7 to 3.3 times more likely to rate their SoP as "low" compared to those living in their neighbourhood for 10 or more years.

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Table 4: Ordered Logistic Regression Model, SoP (n=1132)

Variable	Odds Ratio	95% CI
Immigrant Status (ref=Immigrant)		
Canadian-born	0.836	0.626-1.116
City of Residence (ref=Saskatoon)		
Charlottetown	0.752*	0.552-1.025
Hamilton	1.569**	1.212-2.032
Length of Residence in Canada (ref=10+ years)		
Less than 1 yr	0.752	0.267-2.117
1 to 5 yrs	0.908	0.456-1.809
6 to 10 yrs	0.794	0.343-1.840
Income (ref=$100,000+)		
Less than $20,000	2.230**	1.522-3.268
$20,000 to $39,999	1.867**	1.283-2.716
$40,000 to $59,999	1.710**	1.212-2.413
$60,000 to $79,999	1.408*	0.980-2.022
$80,000 to $99,999	1.580**	1.050-2.380
Age (ref=75+)		
18 to 24	2.196**	1.252-3.853
25 to 34	3.441**	2.076-5.703
35 to 44	2.281**	1.418-3.670
45 to 54	2.638**	1.693-4.111
55 to 64	1.689**	1.078-2.645
65 to 74	0.956	0.585-1.562
Neighbourhood Length of Residence (ref=10+ years)		
Less than 1 yr	3.345**	2.001-5.590
1 to 5 yrs	2.231**	1.644-3.029
6 to 10 yrs	1.748**	1.295-2.360

**statistically significant at $p<0.05$; *close to statistical significance at $p<0.05$

2.6 Discussion

Four variables were found to be significant predictors of SoP: income; age; neighbourhood length of residence; and, city of residence. Individuals with lower household incomes were more likely to have lower evaluations of SoP. Past research has not found income to be a significant predictor of SoP (Williams et al.

2010). However, past studies have found that higher socioeconomic status neighbourhoods have higher evaluations of SoP (Williams et al. 2010; Williams and Kitchen 2012). It is reasoned that individuals with higher incomes have greater residential mobility and can choose to live in neighbourhoods that are conducive to SoP (Williams et al. 2010). Confirming past research, this research suggests that lower evaluations of SoP are more common amongst younger age groups and individuals with shorter lengths of neighbourhood residency (Williams et al. 2010; Williams and Kitchen 2012). As an individual spends more time in a neighbourhood and forms stronger connections with neighbours and place, they are likely to develop a stronger SoP (Williams et al. 2010; Williams and Kitchen 2012). Agreeing with past work, gender was not found to influence evaluations of SoP (Williams et al. 2010; Williams and Kitchen 2012).

When comparing evaluations of SoP by city, residents of Hamilton and Saskatoon had significantly lower evaluations of SoP compared to residents of Charlottetown (Figure 2). Attempts to investigate within-city factors using quantitative analysis were made, however, the sample sizes in Saskatoon and Charlottetown were too small to produce a stratified model. Nevertheless, anecdotal evidence suggests that immigrant service providers in Charlottetown go beyond traditional measures in order to establish relationships between immigrants and Canadian-born individuals[1], which may strengthen SoP. Past

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[1] Presentation on: Immigrants' Quality of Life: Relationship to Adaptation in Three Canadian Cities- A Focus on Second and Third Tier Cities, Charlottetown-specific Implications.

research has shown that settlement and other services are more personalized in smaller cities due to lower demand for services (Frideres 2006). In contrast, larger cities tend to employ 'one-size-fits-all' programs due to cost constraints (Frideres 2006). Both Saskatoon and Hamilton are substantially larger that Charlottetown, which may negatively impact the delivery of immigrant services and the establishment of SoP. In addition, the strong SoP observed among Charlottetown residents may be evidence of the Island's 'unique' SoP, as mentioned above.

Immigrant status was not found to be a significant predictor of SoP; however, phase one indicated that immigrants have lower evaluations of SoP compared to Canadian-born individuals (Figure 1). The lower levels of SoP found amongst immigrant respondents may be explained by a 'disruption' of sense of place. Upon immigration to Canada, individuals must form new connections with people and place, often resulting in stress (Brown and Perkins 1992; Ng 1998). It should also be noted that the immigrant population in Canada has both a younger age distribution and a lower median income than the Canadian-born population (Fougère et al. 2004; Heisz and McLeod 2004; Sharpe 2011). As discussed above, both age and income are significant predictors of SoP. These factors, rather than some innate characteristic of being an immigrant, may explain the lower SoP found amongst immigrants.

Presented by: Craig Mackie, PEI Association for Newcomers to Canada

Limitations of this project include the small sample size of immigrants in each city. The small sample size is most noticeable in Charlottetown, where there were only 32 immigrants in the sample. A second limitation involves the nature of the SoP formula. Individuals who did not answer all sixteen questions were excluded from the analysis. This could introduce a bias towards those who answered all the questions.

2.7 Conclusion

More research is needed to examine the immigrant experience in smaller Canadian cities due to increased immigrant settlement in these areas. This study has evaluated immigrant SoP in three such cities: Hamilton, Saskatoon, and Charlottetown. Using the established SoP formula, evaluations of SoP were compared across immigrant status, city of residence, and gender. Immigrants were found to have lower evaluations of SoP compared to their Canadian-born counterparts. In terms of city of residence, Hamilton residents reported the lowest evaluations of SoP, followed by Saskatoon and Charlottetown residents. Ordered logistic regression identified four significant predictors of SoP across the entire sample: city of residence; income; age; and, neighbourhood length of residence.

This research proposes a number of recommendations to increase immigrant SoP. The recommendations proposed are relevant in small-to-medium-sized cities across Canada, since the cities are representative of three major Canadian regions. Recognizing the intimate relationship between income and

employment, it is suggested that increased recognition of foreign skills and credentials could positively influence immigrant SoP. Immigrants face a number of barriers to employment such as: low English language proficiency; lack of Canadian work experience; devaluation of foreign work experience; and, the lack of recognition of foreign training and education credentials (Galarneau and Morissette 2009; Tran 2004). It is also important to emphasize the role of the host society, including both Canadian-born individuals and established immigrants, in the adaptation of immigrants. The host society must demonstrate a concerted effort to welcome new immigrants and foster a feeling of 'place'. A greater focus on immigrant employment (income) and acceptance of the host society, would improve SoP and the overall experience of immigrant adaptation. More research is needed to determine the specific factors that contribute to Charlottetown's strong SoP, and how this can be implemented in other cities. Further research will employ qualitative methods to further explore immigrant evaluations of SoP.

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Chapter 3

Perceptions of Air Quality and Sense of Place among Immigrant and Canadian-born Women in Northeast Hamilton, Ontario, Canada

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3.1 Abstract

Research on environmental health risks suggests that public perceptions of risk may be greater than quantitative health risk assessments, especially amongst vulnerable groups such as women and immigrants. This mixed-methods study uses the environmental stress and coping framework to examine individual perceptions of air quality amongst Canadian-born and immigrant women in Northeast Hamilton, Ontario, Canada. Furthermore, the study aims to determine the influence of sense of place on local environmental perceptions. Quantitative survey results suggest that Canadian-born residents have a higher absolute value of sense of place than immigrants. Qualitative focus group discussions suggest that, compared to immigrant women, Canadian-born women may be more aware, knowledgeable and concerned about larger-scale air quality issues; however, the tension between economic and environmental needs hinders their sense of control. Triangulating the quantitative and qualitative data suggests that sense of place may inform environmental perceptions.

3.2 Introduction

3.2.1 Literature Review

Poor air quality in Northeast Hamilton can be attributed to a combination of factors, including: industrial emissions; traffic emissions; and, temperature inversions resulting from proximity to Lake Ontario and the Niagara Escarpment (Buzzelli & Jerrett, 2004; Adams et al., 2012). Past studies in Hamilton have shown a negative relationship between socio-economic status and exposure to air pollution (Jerrett et al., 2001; Buzzelli et al., 2003; Buzzelli & Jerrett, 2004). Some evidence suggests that certain visible minority groups may also be disproportionately exposed (Buzzelli & Jerrett, 2004).

Research on environmental health risks suggests that white males tend to rate risks lower than all other groups (white women and non-whites), providing a rationale for this research (Flynn et al., 1994; Finucane et al., 2000). According to the postmaterialist thesis, the environmental perceptions of immigrants might differ from that of the dominant social group (Lovelock et al., 2013). The postmaterialist thesis suggests that individuals from richer, more developed countries have higher levels of environmental concern than those from poorer, less developed countries (Inglehart, 1995; Lovelock et al., 2013). The postmaterialist thesis reasons that individuals residing in developing countries are preoccupied with meeting basic needs; and therefore are less concerned about the environment (Inglehart, 1995; Lovelock et al., 2013). However, it is suggested that immigrants from less developed countries may experience increased levels of

environmental concern once they become settled in a more developed country (Inglehart, 1995; Lovelock et al., 2013). Furthermore, women exhibit greater concern for environment and health compared to men, due to their traditional role as caregivers (Stern et al., 1993; Momsen, 1999).

Past geographical studies have used the environmental stress and coping theory as a framework for examining individual perceptions and resulting coping strategies associated with environmental risk (Elliott et al., 1997; Wakefield et al., 2001). Within this theoretical approach, stress is defined as "the process by which environmental events or forces, called stressors, threaten an organism's existence and well-being and by which the organism responds to this threat" (Baum et al., 1982, 15). Environmental pollution is recognized as a stressor (Shankardass, 2012). The environmental stress and coping theory involves three main components: perceptions or appraisals of the stressor; coping with the stressor; and, adapting to the stressor (Baum et al., 1982; Bell & Fisher, 1990). This study will focus on individual perceptions and chosen coping strategies related to air pollution.

A number of factors have been found to influence individual perceptions of air quality including: knowledge and awareness (Crowe, 1968; Swan, 1970; Evans & Jacobs, 1982; Bickerstaff & Walker, 2001); perceived control and coping abilities (Baum et al., 1982; James & Eyles, 1999); concern and perception of risk (Baum et al., 1982; Elliott et al., 1999; Bush et al., 2001); and, sense of place and place attachment (Kaltenborn, 1998; Bickerstaff & Walker, 2001; Bush et al., 2001;

Vaske & Kobrin, 2001; Vorkinn & Riese, 2001). Public knowledge of air pollution tends to be limited to suspected causes and observed effects, rather than knowledge about its actual composition (Evans & Jacobs, 1982). However, individuals with a higher level of education or higher socioeconomic status are more likely to define air pollution in terms of its causal agents and complex nature (Crowe, 1968). Individual awareness of air pollution often results from sensory information such as, poor visibility, odours, or discoloration of property (Evans & Jacobs, 1982; Bickerstaff & Walker, 2001). Studies have shown that lower socioeconomic status groups tend to be less aware of air pollution (Swan, 1970).

Individuals with a strong sense of control feel that they can effectively cope with a stressor; therefore, perceived control is recognized as a mediator of stress (Baum et al., 1982). Comparatively, individuals with a weak sense of control are less likely to take action against the stressor (Baum et al., 1982). Studies have shown that, in general, individuals perceive low levels of control over the environment; this is especially true for those in vulnerable groups (Baum et al., 1982; James & Eyles, 1999). Evaluation of a stressor is dependent upon the perception of risk associated with the stressor (Baum et al., 1982). Within the context of air pollution, public perceptions of risk may be greater than quantitative health risk assessments, or individuals may choose to disassociate themselves from apparent health risks (Elliott et al., 1999; Bush et al., 2001).

Coping with an environmental stressor can be either problem-focused or emotion-focused (Lazarus & Folkman, 1984). Problem-focused strategies involve attempts

to manipulate the relationship between the individual and the stressor by generating solutions and taking action, such as, forming a local citizen's group (Baum et al., 1982; Lazarus & Folkman, 1984; Wakefield et al., 2001). Examples of active coping mechanisms associated with air pollution include: seeking information or voicing complaints about air pollution; altering transportation behaviour or reducing outdoor activities during periods of high air pollution concentration (Lazarus & Folkman, 1984). In contrast, emotion-focused strategies do not involve changing objective situations (Lazarus & Folkman, 1984). Instead, individuals alter their internal environment, for example through avoidance or reassessing the situation as non-threatening, in order to lessen emotional distress (Lazarus & Folkman, 1984; Baum et al., 1982; Bell & Fisher, 1990). For example, individuals may acknowledge a linkage between air pollution and health, but deny personal risk (Bickerstaff & Walker, 2001).

Furthermore, this research explores whether perceptions of air quality and chosen coping strategies are informed by individual evaluations of sense of place (SoP). SoP has been described as: "the attitudes and feelings that individuals and groups hold *vis-à-vis* the geographical areas in which they live. It further commonly suggests intimate, personal and emotional relationships between self and place" (Wylie, 2009, 676). The physical environment is largely absent in SoP literature, providing further rationale for this study (Stedman, 2003). This research builds on earlier work, which found that immigrants in Hamilton had lower evaluations of SoP than their Canadian-born counterparts (Gallina & Williams, 2014). Lower

evaluations of SoP amongst immigrant respondents may be attributed to: a 'disruption' of SoP during the immigration process; younger age distribution; and/or, lower median incomes (Gallina & Williams, 2014).

Place attachment, a concept closely linked with SoP, has been related to environmental perceptions (Vaske & Kobrin, 2001). Place attachment refers to "the affective link that people establish with specific settings, where they tend to remain and where they feel comfortable and safe" (Hernandez et al., 2007, 310). For example, a study conducted in Norway determined that residents with higher levels of place attachment were more likely to have negative attitudes towards development causing environmental harm (Vorkinn & Riese, 2001). Kaltenborn (1998) suggests that individuals with a strong SoP are more committed to solving problems associated with local environmental issues. Conversely, studies have also identified a 'neighbourhood halo effect' where individuals are reluctant to acknowledge local pollution due to a strong commitment to place (Bickerstaff & Walker, 2001; Bush et al., 2001; Vaske & Kobrin, 2001). Furthermore, there is a gender dimension to SoP. Past research has shown that women are more "neighbourhood dependent" than men and tend to exhibit higher levels of place attachment (Hidalgo and Hernandez, 2001; Meegan and Mitchell, 2001).

This paper addresses the following research question: *How do perceptions of air quality vary between immigrant and Canadian-born women living in Northeast Hamilton, and are they informed by SoP?* There are three objectives associated with this research question: (1) to compare perceptions of air quality between

immigrant and Canadian-born women; (2) to investigate coping strategies associated with poor air quality among these two groups; and, (3) to determine if evaluations of SoP inform perceptions of air quality. Following a description of the field site, the quantitative and qualitative methods employed in this research are outlined. Results are presented from the SoP survey and the focus group discussions. This is followed by a discussion and conclusions.

3.2.2 Site Context

Hamilton is a mid-sized Canadian city located in Southwestern Ontario, approximately 75 km west of Toronto (Williams & Kitchen, 2012). In 2011, Hamilton's population was just under 520,000 (Statistics Canada, 2012). The city, once a hub of industrial activity and steel production, has experienced economic restructuring in recent years, with development in the health and education sectors (Eby et al., 2012; Williams & Kitchen, 2012). This reduction in manufacturing has resulted in economic decline within the city's inner core (Eby et al., 2012; Williams & Kitchen, 2012). In 2005, Hamilton's poverty rate was 18%, compared to 15% for the province as a whole (Mayo & Fraser, 2009). However, poverty in Hamilton is unevenly distributed and income inequality continues to grow (Mayo & Fraser, 2009; Mayo & Pike, 2013). Residents living below the poverty line are concentrated among several neighbourhoods within the downtown core, with poverty rates reaching up to 46% (Mayo & Pike, 2013). Certain vulnerable groups, such as women and recent immigrants, are more likely to live under the poverty line (Mayo & Fraser, 2009).

3.3 Methods

This study employed a mixed-methods approach, including both a quantitative survey and focus group discussions. According to Crooks et al. (2011), employing mixed methods research within geography produces richer results compared to using either quantitative or qualitative methods on their own.

3.3.1 Quantitative

Data for this project was obtained from a household-based telephone survey conducted in Hamilton during the summer of 2012 (n=716), as part of a larger quality of life study funded by the Social Sciences and Humanities Research Council (SSHRC). The survey respondents were split between immigrants (those not born in Canada) and Canadian-born residents; approximately 60% of survey respondents were born outside of Canada. Approximately 60% of the respondents were female and 40% were male. Sample size, for both the number of households and the size of the immigrant population, were informed by the 2006 census; households were randomly selected to participate in the survey. Participants were asked to complete a 16-item SoP scale, developed by Williams et al. (2010) (Table 5). The survey evaluates individual perceptions of four SoP factors: neighbourhood rootedness; neighbourhood sentiment; neighbours; and, environment and health using a 5-point likert scale.

Table 5: 16-item Sense of Place Scale (Williams et al. 2010)a

The following statements and questions have to do with your feelings about your neighbourhood. For each, indicate the degree to which you agree or disagree.				
D1. My neighbourhood means a great deal to me.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D2. There's no other neighbourhood I would rather live.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D3. I feel at home in my neighbourhood.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D4. There are people in my neighbourhood who I think of as close friends.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D5. I would like to stay in my neighbourhood as long as my health allows me to do so.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D6. Green space availability in my neighbourhood positively influences my health.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D7. Environmental problems in my neighbourhood (e.g. air pollution, run-down buildings) negatively influence my health.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D8. Social problems in my neighbourhood (e.g. racism, violence) negatively influence my health.				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
D9. The personal safety of myself and my family in my neighbourhood negatively affects my health				
1 (Strongly agree)	2 (Agree)	3 (Neutral)	4 (Disagree)	5 (Strongly disagree)
How true are the following two statements?				

D10. I know many of my neighbours on a first name basis.				
1 (Very true)	2 (Fairly true)	3 (Neutral)	4 (Not very true)	5 (Not at all true)
D11. If I were to live somewhere else, it would be difficult to move away from my neighbourhood.				
1 (Very true)	2 (Fairly true)	3 (Neutral)	4 (Not very true)	5 (Not at all true)
I would like to ask you several more questions on how you feel about your neighbourhood.				
D13. How rooted do you feel in your neighbourhood?				
1 (Very rooted)	2 (Fairly rooted)	3 (Neutral)	4 (Not very rooted)	5 (Not at all rooted)
D14. How connected do you feel to your neighbourhood?				
1 (Very connected)	2 (Fairly connected)	3 (Neutral)	4 (Not very connected)	5 (Not at all connected)
D15. How much do you like your neighbourhood?				
1 (A great deal)	2 (A fair amount)	3 (Neutral)	4 (Not very much)	5 (Not at all)
D16. How often do you participate in social activities with your neighbours (e.g barbeques, coffee dates, etc.)				
1 (All the time)	2 (Often)	3 (Sometimes)	4 (Hardly ever)	5 (Never)
D17. If you had to leave your neighbourhood, how many of your neighbours would you miss?				
1 (Many of them)	2 (Some of them)	3 (Neutral)	4 (Hardly any of them)	5 (None of them)

[a] *Factors*

Neighbourhood rootedness=D2+D13+D5+D11
Neighbourhood sentiment=D1+D3+D14+D15
Neighbours=D10+D16+D4+D17
Environment and health=D6+D7+D8+D9

An established SoP formula (Williams et al., 2010) was employed to calculate individual evaluations of SoP (below). Due to the nature of the SoP formula, any records with a missing response to one of the sixteen SoP questions were

eliminated from the analysis. Further information on the SoP scale and its analysis can be found in the authors' earlier work (Gallina & Williams, 2014).

$Neighbourhood\ SoP$

$$= \left[\frac{(20 - \Sigma Factor1) + (20 - \Sigma Factor2) + (20 - \Sigma Factor3) + (20 - \Sigma Factor4)}{64}\right]$$

$\times\ 100$

Individual evaluations of SoP were used to calculate mean SoP values for: (1) Canadian-born women; (2) immigrant women; (3) Canadian-born men; and, (4) immigrant men. In addition, the focus group participants (n=16) were asked to complete a hardcopy of the survey upon completion of the group discussion. A total of 631 telephone survey responses and 13 focus group survey responses were included in the analysis. SAS statistical software was used to analyze the telephone survey data; Excel was used to create the figures below. The resulting SoP values were triangulated with the qualitative results of this study. Mean survey responses were compared between the telephone surveys and focus group surveys. Qualitative focus group data was used to provide depth to the discussion of SoP within the quantitative data.

3.3.2 Qualitative

Two focus groups were conducted during the summer of 2013 (n=2). The first focus group was comprised of Canadian-born women (n=8); the second group was comprised of immigrant women from a variety of ethnic backgrounds (n=8). The majority of immigrant women originated from the Middle East and Africa.

Recruitment of the focus group participants was completed with the assistance of local community organizations. Participants were selected based on: their gender (female); immigrant status; and neighbourhood of residence (Northeast Hamilton). For the purpose of this study, immigrants are defined as those who currently reside in Canada but were born outside of the country. In order to participate in this study, individuals were required to have a working knowledge of the English language; therefore, translation services were not provided. Table 6 contains further socio-demographic information of the research participants. Participants discussed their perceptions of neighbourhood air quality and neighbourhood SoP during the focus group sessions.

Table 6: Socio-demographic characteristics of focus group participants

Particip-ant	Length of Residence (neighbou-rhood)	Length of Residence (address)	House-hold	Age Group	Length of Residence (Canada)	Income Class
A) Canadian-born						
CB-A	1-5 years	1-5 years	Own	45-54	NA	$100,000 +
CB-B	5-10 years	5-10 years	Rent	25-34	NA	$20,000 - $39,999
CB-C	5-10 years	1-5 years	Own	35-44	NA	Less than $20,000
CB-D	5-10 years	5-10 years	Own	25-34	NA	$60,000 - $79,999
CB-E	1-5 years	1-5 years	Rent	45-54	NA	$40,000 - $59,999
CB-F	Don't know	Less than 1 year	Rent	45-54	NA	$20,000 -

						$39,999
CB-G	Don't know	Less than 1 year	Rent	18-24	NA	Less than $20,000
CB-H	Over 10 years	Less than 1 year	Rent	25-34	NA	$20,000 - $39,999
B) Immigrant						
IM-A	5-10 years	5-10 years	Rent	35-44	Over 10 years	Less than $20,000
IM-B	1-5 years	Less than 1 year	Rent	35-44	1-5 years	Less than $20,000
IM-C	1-5 years	*	Rent	25-34	1-5 years	*
IM-D	1-5 years	Less than 1 year	Rent	45-54	1-5 years	Less than $20,000
IM-E	1-5 years	Less than 1 year	Rent	25-34	1-5 years	Less than $20,000
IM-F	Over 10 years	Over 10 years	Rent	45-54	Over 10 years	Less than $20,000
IM-G	5-10 years	1-5 years	Rent	35-44	5-10 years	Less than $20,000
IM-H	*	*	*	*	*	*
Did not provide demographic information						

Nearing the end of each session, participants began to repeat earlier ideas and themes, indicating that saturation was reached. Focus groups were audio recorded and transcribed verbatim. All research participants were given the opportunity to verify the transcripts prior to analysis. NVIVO 9 was used to thematically code (Hay, 2010) the transcripts for: awareness of air quality; knowledge of air quality; concerns/risk perception; perceived control; coping mechanisms; and,

neighbourhood perceptions. Codes were developed based on the academic literature specific to: environmental stress and coping theory; and, SoP.

3.4 Results

3.4.1 Quantitative
Figure 1 shows the mean SoP values and 95% confidence intervals. Values closer to 100 indicate more positive evaluations of SoP. Mean SoP values are as follows: Canadian-born women 65.84 (63.58-68.09); immigrant women 62.04 (59.49-64.60); Canadian-born men 64.71 (62.25-67.17); and, immigrant men 61.25 (57.69-64.80). None of the means are significantly different at the 95% confidence level.. Though not statistically significant, the absolute value of SoP for Canadian-born women is higher than that of their immigrant counterparts; this result agrees with the results published in the authors' earlier work (Williams and Kitchen, 2012; Gallina and Williams, 2014). In addition, both groups of women had higher absolute values of SoP than their male counterparts.

Figure 5: Sense of Place in Hamilton, Ontario: Telephone Survey (n=631)
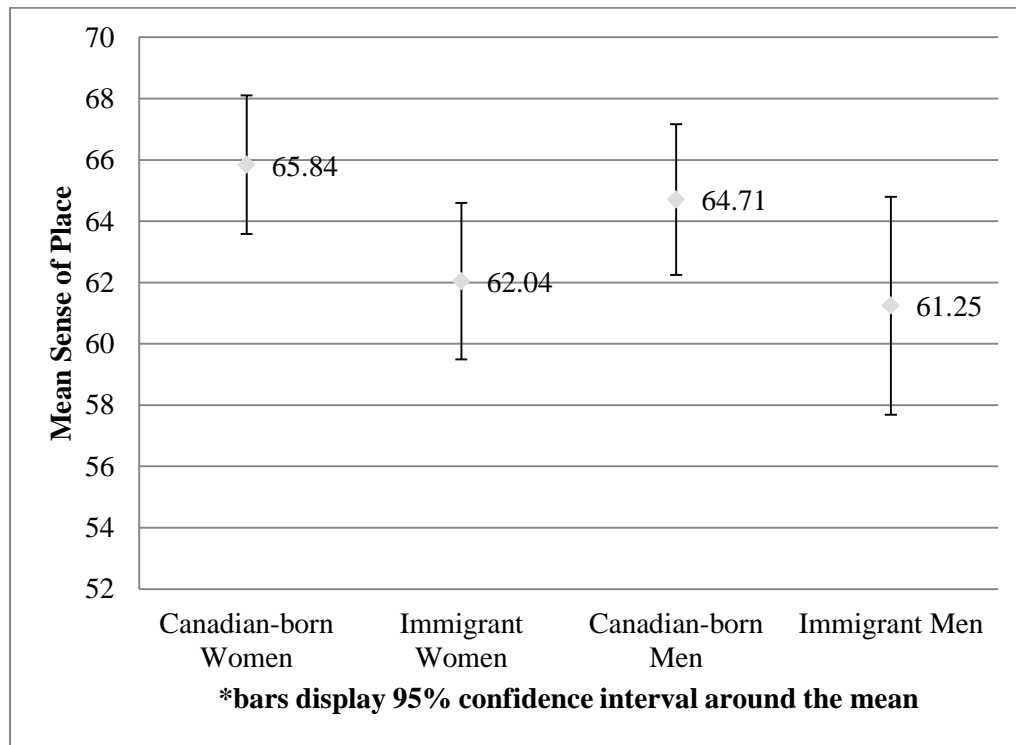
3.4.2 Qualitative
Awareness of Air Quality

Overall, the Canadian-born women are more aware of air quality issues in their neighbourhood, whereas the immigrant women require much more probing. Canadian-born women display their awareness of air quality through the discussion of sensory cues. For example, a Canadian-born participant comments on the dust from air pollution, and highlights the persistence of the issue:

CB-D: "I was going to comment on the windows thing, I've noticed that where the window meets the frame, there's just a little crack of air and that's

where I get a nice little black line. And it's really interesting because I can clean that and then that line's there again in a day or two."

A second Canadian-born participant acknowledges the unpleasant odour associated with local industry:

CB-F: "And then you add the soy plants in, and the stench coming from Dofasco, and you've got one heck of an odour in the air."

Canadian-born women frequently mention such sights and smells, which are often attributed to industrial processes. However, only one participant among the immigrant women's group mentioned a smell associated with industry:

IM-B: "...there's some smell from I think the companies and if you go outside and around in the morning there's some smell outside."

Participants tend to employ comparative techniques when describing their experiences with air quality. Canadian-born women compare their neighbourhood's air quality to other areas of Hamilton, Ontario, and Canada. However, immigrant women compare air quality to that of their home country. Individual awareness of air quality issues appears to be impacted by one's lived experience, as demonstrated below. For example, a Canadian-born participant compares the air quality in Hamilton to that of Sudbury:

CB-F: "I lived in Sudbury for 4 years… and the air there is just phenomenal, like you don't get the… there's just no factories to make the

pollution up there, and I notice now, and I never noticed it living in Hamilton my whole life, you come over the Skyway and there's a particular odour [agreement], and it's that smell of the steel city. And you don't get that... I didn't notice it for so long... you live out of the city for so long where the air is so pure and clean and you come back to visit and it's like... it's gagging almost... you get used to it after time, you don't notice it, but you leave and come back and it's... for me anyways..."

An immigrant participant compares the air quality in Canada with her home country in the Middle East:

IM-E: "For us, like we found no, here is better. We can't compare like... because the war, yea it's better, because they causes more pollution than Canada."

In summary, Canadian-born women may be more aware of large-scale air quality issues in Hamilton and their neighbourhood specifically. Canadian women are more likely to acknowledge problems with air quality in their neighbourhood and identified industry as the cause of the pollution. Perceptions of air quality seem to be informed by past lived experiences, with Canadian-born individuals being more critical than immigrant participants with respect to air quality issues in Hamilton.

Knowledge of Air Quality

Similarly, the Canadian-born women may be more knowledgeable about the large-scale sources of air pollution. Canadian-born women identify industry as the source of air pollution, as displayed below. In comparison, immigrants tend to focus on individual agents, such as cigarette smokers producing second-hand smoke. A Canadian-born woman identifies local sources of air pollution:

> *CB-F: "...we've got the air that comes from Dofasco [steel manufacturing plant] plus from the soy plants this way, plus right across the street from us they clean the machines that run at Dofasco, so we get like black stuff flying around in the air, so it's pretty, pretty nasty."*

Immigrant participants do not feel that air pollution was a large problem in the neighbourhood. The immigrant women feel that second-hand smoke was a more pressing issue:

> *IM-C: "The pollution is good, for me too it's good. The problem is just those people when they are smoking."*

It can be concluded that both Canadian-born and immigrant women have some knowledge of air quality issues; however, the scale of this knowledge is quite different. Canadian-born women recognize industry as the large-scale source of air pollution, whereas immigrants focus on more immediate, individual causes of environmental pollution.

Concern/Risk Associated with Air Quality

Canadian-born women are quite concerned about the health effects associated with poor air quality. Participants mention their own experiences, as well as the health conditions experienced by their children. For example, a Canadian-born woman attributes her daughter's health condition to poor neighbourhood air quality:

CB-F: "It bothers me as well, my 5-year-old has just acquired asthma, she's just been diagnosed with it, so… I can only think that it has happened because of what's going on in the air."

The immigrant women are not concerned about the negative health impacts of air pollution in the same capacity as their Canadian-born counterparts. Immigrant women were found to be much more concerned about other environmental health hazards, such as second-hand smoke. The following quotes demonstrate immigrant women's concern surrounding second hand smoke: *IM-D: "Well the people smoking, the smell of the drugs, you know the people cannot take that. And the kids too, if you have problem of the health. It's so hard."*

IM-B: "Yea, because when they do the smoking, they stand outside at 2 AM in the morning, even to sleep is dangerous for us..."

Canadian-born women are also more knowledgeable of the specific health effects associated with air pollution, as depicted in the following section. The immigrant

women are aware of the negative health effects associated with poor air quality on a smaller scale (i.e. second-hand smoke), although they do not discuss the health impacts associated with larger scale industrial pollution. It should be noted that not all participants reported negative health impacts associated with air quality.

Perceived Control over Air Quality

Canadian-born women argue that shutting down industry is not a viable solution to improve air quality, despite concern over industrial pollution. These women are familiar with Hamilton's economic difficulties and are worried about further job loss. There is also a sense of apathy among the Canadian-born women, given their acknowledgement of the legacy of industry in Hamilton. A Canadian-born participant highlights the tension between environment and economy:*CB-A: "Well, you think of how many people have lost jobs already, and like [Participant] said it's a steel town so like people are already struggling in the area so we take away more jobs and more employment, then what's left?"*

The following quotes from Canadian women demonstrate the lack of control associated with Hamilton's industrial legacy:

CB-G: "We won't be able to [improve air quality], until they move the factories, which will never happen."

CB-B: "I don't see a problem with it… I mean there is a lot of particles in the air, but what are we going to do about it, it's an industrial town so…"

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Canadian-born women are interested in collectively making existing industry cleaner, although their individual perceived control is lacking. A Canadian-born woman proposed community organization as a potential solution:

CB-D: "I think what I was getting at more is the sense of having more people in sort of the, an association, a bigger body of people, so that when we go to the City of Hamilton and say, you know we've got 500 folks that meet once a month… and this is a concern for us, for 500… it carries some weight."

In comparison, the immigrant women do not feel a sense of control over their immediate environment. Therefore, it is unlikely that they would feel a sense of control over large-scale environmental concerns, such as air quality. For example, the following quote displays the lack of control over exposure to second-hand smoke:

IM-D: "You cannot stop the life of somebody… if they are smoking now you cannot say to stop to smoke."

Overall, it can be seen that immigrant women have a very weak sense of control over their neighbourhood air quality. The Canadian-born women have a comparatively stronger sense of control; however they recognize Hamilton's industrial legacy and the economic consequences associated with action.

Neighbourhood Perceptions

Both groups of women appear to be satisfied with their neighbourhood, mentioning safety, convenience, and services as important factors. For example, a Canadian-born participant explains that she is proud to live in the neighbourhood due to the number of resources available:

CB-F: "So that tells you, like the area is slowly up and coming and I would say that I'm fairly proud of the neighbourhood ...with the community centres that we have and the resources for the people in the community, how close we are, the barbeques at the park where the whole neighbourhood's invited. You can live as far as Sherman and be able to come over this way. You know it's a nice thing to be part of a neighbourhood that has so many resources."

An immigrant participant highlights the importance of neighbourhood safety:

IM-E: "Yea, the safety and the community centre here."

The Canadian-born women seem fairly connected with their neighbours, despite issues with transience. The immigrant women are very connected within their ethnic communities, but not as connected with the Canadian population as a whole. A Canadian-born woman describes her close connections within the neighbourhood:

CB-F: "And, you know we kind of watch out for each other and keep an eye, and you know who's coming on the street, you know the regular vehicles that drive up and down so if you see a vehicle that you don't know…"

A second Canadian-born participant describes transiency as a barrier to forming neighbourhood connections:

CB-D: "I wouldn't have a clue about the names of any of my neighbours… 'Cause of the transient nature of the building I'm in."

The following quote shows a lack of connection between the immigrant women and Canadian-born population:

IM-A: "So many years I am in Canada, I don't have any Canadian friend."

In summary, both groups have generally positive perceptions of their neighbourhood. However, both groups mention issues with neighbourhood connectedness. This was especially prevalent within the immigrant women's focus group, highlighting a lack of connection with Canadian-born individuals.

Coping Mechanisms

Both the Canadian-born and immigrant groups tend to employ problem-focused coping in response to their environmental perceptions. Coping mechanisms are often changes in individual behaviours, rather than reporting to

higher authorities. A Canadian-born woman explains how she painted her house to cope with air quality issues:

CB-A: *"And it's just the dust, like the front of my house, that's why I painted it green. When I first moved there it was white and stuff like that and then I was done. And I have OCD [obsessive compulsive disorder] so I like to clean and I just, I quit, I couldn't do it, I couldn't keep up [laughter]."*

An immigrant participant alters her behaviour in response to poor air quality:

IM-D: *"We choose the place where to sit if the smell is at the front of the house, we choose to go in the back."*

A number of participants in each group indicate that they had taken more proactive coping approaches by reporting to higher authorities; however, behaviour changes are much more prevalent. Three of the Canadian-born women acknowledge reporting air quality issues to the local government (bylaws), while one immigrant women reports air quality issues to her landlord.

3.5 Discussion & Conclusions

Overall, the focus group discussions suggest that Canadian-born women may be more knowledgeable and aware of large-scale air quality issues in their neighbourhood. Furthermore, the Canadian-born women appear to be more concerned about air pollution and associated health impacts. Immigrant women were likely unaware of large-scale air quality issues due to their focus on more

immediate environmental concerns. The majority of immigrant participants have low incomes, as shown in Table 5. Therefore, it can be reasoned that these individuals are also preoccupied with meeting basic needs. These findings support previous research, which suggested that individuals with low socioeconomic status are less likely to be aware of air quality and associated issues (Swan, 1970). Furthermore, these results support the postmaterialist thesis for environmental concern (Inglehart, 1995; Lovelock et al., 2013). It should also be noted that immigrant women compared the air quality in Canada to that of their home country, with some women acknowledging that the air is cleaner in Canada. The immigrant women might not recognize air quality as problematic in Canada since air quality issues are more salient in their home country (Schultz et al., 2000).

Both groups tended to employ problem-focused coping mechanisms. In both cases, these mechanisms tended to be reactive (i.e. altering individual behaviours) rather than preventative (i.e. taking action to address the source of pollution). It can be argued that their motivations for these actions differ, though both groups of women used similar coping mechanisms. It can be reasoned that immigrants are unaware of the sources of air pollution (i.e. industry) and thus cannot take preventative action. In comparison, the Canadian-born women are knowledgeable about the sources of pollution; however they are wary of the economic consequences associated with preventative action.

Triangulating the qualitative and quantitative analyses, it appears that individuals with a higher SoP (i.e. Canadian-born respondents) may be more aware,

knowledgeable, and concerned about higher-level environmental issues in their neighbourhood (i.e. air quality). Based on this finding, it may be suggested that SoP informs environmental perceptions. This is in keeping with the known evidence described above, with respect to both research on the postmaterialist thesis (where it is suggested that immigrants have lower levels of environmental concern when compared to native residents) and SoP (where, again, immigrants are found to have lower evaluations when compared to native residents).

Gallina and Williams (2014) suggest that increases in length of neighbourhood residence, median income, and age distribution would lead to stronger feelings of place amongst immigrant respondents. Therefore, assuming that immigrants follow the same trend as their Canadian-born counterparts, it may be expected that one would see an associated increase in environmental awareness, knowledge, and concern amongst immigrants if their SoP evaluations improve. This may translate into an increased commitment to address local environmental issues, as suggested by Kaltenborn (1998). Conversely, it is feasible that this could be a reciprocal relationship, where environmental perceptions also inform SoP. This relationship could be the focus of further research.

This study addressed three research objectives: (1) to compare perceptions of air quality between immigrant and Canadian-born women; (2) to investigate coping strategies associated with poor air quality among these two groups; and, (3) to determine if evaluations of SoP inform perceptions of air quality. Canadian-born women had higher evaluations of SoP than immigrant women. Differences in air

quality perceptions across the two sample populations may be attributed to: lower socioeconomic status among immigrant women; comparative views of air quality; and, relative variation in levels of environmental concern across countries (i.e. country of origin versus country of residence). It is concluded that SoP and environmental perceptions might inform one another in a reciprocal manner; however, it is likely that there are other factors that shape this relationship.

There are a number of limitations to this study. One limitation of the study is that the focus groups were conducted in different neighbourhood areas due to difficulties with recruitment. The Canadian-born women were a more accessible population; a second neighbourhood was added to the recruitment strategy in order to reach the immigrant population, there may be other contextual factors influencing individual perceptions, even though the neighbourhood were near one another and similarly impacted by air pollution sources.

The respondents involved in the quantitative analysis were split between both genders; however, the focus groups involved only women. Originally, the researcher attempted to recruit both men and women for the focus groups; however, the male population was much more difficult to reach. As suggested in previous research, women may be more interested and concerned about the natural environmental and the potential impacts on their family (Stern et al., 1993; Momsen, 1999). Nevertheless, it is recognized that the results of this research are unique to the female population. Finally, it is very likely that emotion-focused

strategies were not discussed in the focus group, possibly due to the lack of familiarity and comfort with the other participants.

Greater emphasis is needed on immigrants' environmental education and the relationship between environmental issues and human health so that they may cope with exposures accordingly. It is noted that, within the Canadian-born focus group, women acknowledged that when addressing local environmental issues, there is "power in numbers", implying that there is an increased sense of control over such issues when working as a group, when compared to individuals themselves. Bringing this idea together with the recommendations above, it is suggested that Canadian-born individuals actively include immigrants in such efforts. The inclusion of immigrants in such efforts not only increases awareness of environmental issues, but may also increase immigrant commitment to place. Furthermore, the immigrants would add a unique perspective to community efforts, making such a proposition mutually beneficial. Further research could explore the motivations for chosen coping mechanisms, whether problem-focused (reactive or preventative) or emotion-focused, as mentioned above. Further research may also compare immigrants' environmental perceptions based on their country of origin.

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Chapter 4

Conclusion

4.1 Introduction

The objectives of this thesis project were threefold: (I) to establish measures and determinants of *sense of place* across immigrant status and gender in Hamilton, Saskatoon, & Charlottetown; (II) to compare air quality perceptions and associated coping strategies between immigrant and Canadian-born women in Hamilton; and, (III) to determine if evaluations of *sense of place* inform perceptions of air quality among these women. These three objectives were satisfied via the presentation of two articles (Chapters 2 & 3, which have been submitted and/or accepted for publication). The papers employed both quantitative methods, utilizing ordered logistic regression to analyze survey data, and qualitative focus groups, which were thematically analyzed. This chapter provides a summary of the entire thesis project, and discusses the relationship between each of the individual papers. This concluding chapter also presents study limitations, recommendations, and directions for further research.

4.2 Summary of Major Findings

The first paper presented in this thesis (Chapter 2) employed quantitative methods to establish a variety of measures and determinants of *sense of place*, satisfying the first objective. Ordered logistic regression determined four significant predictors of *sense of place* among Canadian-born and immigrant

residents of the three cities in question: income; age; neighbourhood length of residence and, city of residence. Younger individuals, those with lower income levels, and those with shorter neighbourhood residency were more likely to evaluate their *sense of place* as low. Comparison across city sites illustrated that Hamilton residents had the lowest *sense of place*, followed by Saskatoon and Charlottetown residents. *Sense of place* did not vary significantly across gender. In terms of immigrant status, those who were not born in Canada (immigrants) were found to rate their *sense of place* lower than their Canadian-born counterparts. Despite this observed difference in evaluations of *sense of place* between immigrants and Canadian-born individuals, regression analysis did not identify immigrant status as a significant predictor of *sense of place*. It was reasoned that the low *sense of place* experienced by immigrants may be attributed to other factors, including *sense of place* disruption, a younger age distribution, and a lower median income, rather than the innate characteristic of being an immigrant.

The second paper presented (Chapter 3) employed both quantitative and qualitative methods to address the two remaining objectives. One of the questions within the 16-item *sense of place* survey addressed environmental perceptions (#D7); focus group discussions were used to gain further contextual information about environmental perceptions and potential influences on individual evaluations of *sense of place.* Focus group data suggested that Canadian-born women may be more aware and knowledgeable about large-scale air quality

issues, compared to their immigrant counterparts. Perhaps coincidently, Canadian-born women were also more concerned about the health impacts associated with poor air quality. Despite the recognition of negative health impacts, Canadian-born women were aware of the tension between local economic and environmental issues, which limited their sense of control. In comparison, immigrant women were focused on more immediate environmental concerns, which may be attributed to their comparative perspective (i.e. country of origin versus country of residence). These differences in air quality perceptions amongst the two groups may be due to: lower socioeconomic status among immigrant women; comparative views of air quality; and, relative variation in levels of environmental concern across countries. In terms of chosen coping mechanisms, both groups tended to employ reactive problem-focused methods (i.e. altering individual behaviours).

Bringing the two papers together, it appears that individuals with a higher *sense of place* (i.e. Canadian-born respondents) may be more aware, knowledgeable, and concerned about higher-level environmental issues in their neighbourhood (i.e. air quality). Paper one suggested that increases in length of neighbourhood residence, median income, and age distribution would lead to stronger feelings of place amongst immigrant respondents. Therefore, assuming that immigrants follow the same trend as their Canadian-born counterparts, it may be expected that one would see an associated increase in environmental awareness, knowledge, and concern amongst immigrants if their *sense of place*

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evaluations improve. This may translate into an increased commitment to address local environmental issues, as suggested by Kaltenborn (1998).

4.3 Associated Recommendations

The first paper proposed a number of recommendations to improve immigrant *sense of place*. Overall, it was suggested that greater emphasis on immigrant employment (recognizing the intimate relationship between employment and income) and acceptance of the host society, may be important to increase the *sense of place* among immigrants to Canada. Recognizing the lack of awareness of higher-level environmental risks, the second paper recommended a greater focus on immigrants' environmental education. An increased understanding of the relationship between environmental issues and human health may assist immigrants in coping with such exposures (i.e. air pollution).

It is noted that within the Canadian-born focus group, women acknowledged that when addressing local environmental issues, there is "power in numbers", implying that there is an increased sense of control over such issues amongst a group, when compared to individuals themselves. Bringing this idea together with the recommendations above, it is suggested that Canadian-born individuals actively include immigrants in such efforts. Inclusion of immigrants in such groups will not only increase awareness of environmental issues, but may also increase immigrant commitment to place. Furthermore, the immigrants would

add strength and unique perspectives to community efforts, making such a proposition mutually beneficial.

4.4 Study Limitations

In the first paper, there were a small number of immigrants in the survey sample, especially in Charlottetown. Furthermore, the total sample size in both Charlottetown and Saskatoon were too small to allow for city-specific analysis. Attempts were made to stratify the sample and create separate regression models for each of the cities; however the models for Charlottetown and Saskatoon were not significant due to a small sample. In the second paper, focus group participants were also asked to complete the *sense of place* survey, in order to determine if evaluations of *sense of place* were related to individual perceptions of air quality. However, as noted above, the results of the *sense of place* survey contrasted with those of paper one. This discrepancy was likely caused by the small sample size, inherent in the focus group structure. Due to the larger sample size, the results of the first paper are more representative.

Discrepancy between the results of the two papers may also be due to the incorrect completion of the *sense of place* scale. Due to the nature of the *sense of place* formula, individuals who did not complete the entire survey were excluded from analysis. This issue was prevalent among the immigrant women focus group participants; three of the women did not complete the survey correctly, possibly due to language barriers. Some of the immigrant women also had difficulty

understanding the *sense of place* questions and relied on interpretation from the researcher and fellow participants. Thus, the group's average *sense of place* score may not have been reflective of the actual *sense of place* experience.

Another set of limitations is related to the selection of the study location and population. As noted in the first paper, the three city sites were selected based on a convenience sample and are not necessarily representative of all second and third-tier Canadian cities. However, households were randomly sampled within each of the three cities. The respondents involved in the quantitative analysis were split evenly between both genders; however, the focus groups involved only women. Originally, the researcher attempted to recruit both men and women for the focus groups; however, the male population was much more difficult to reach. As suggested in previous research, women may be more interested and concerned about the natural environmental and the potential impacts on their family (Stern et al., 1993; Momsen, 1999). Nevertheless, it is recognized that the results of this research are unique to the female population. Furthermore, the qualitative results are specific to Hamilton, and are not generalizable to the other city sites.

4.5 Knowledge Transfer

This research was presented at a number of conferences and public forums. Completed presentations include: SGES Research Day (2013 & 2014); and, the International Medical Geography Symposium. Future presentations include: the Canadian Association of Geographers Annual Meeting; and, the

Environmental Studies Association of Canada Annual Meeting. Complete conference details are provided in Appendix 9.

In addition to academic knowledge transfer, research results have been shared with the community. This community knowledge transfer will take two forms. First, a two-page lay report (Appendix 10) was distributed to all research participants, key informants, and community partners via email and/or mail as indicated in the MREB consent form. Second, research results were presented at two local community meetings within the McQuesten and Keith neighbourhoods.

4.6 Final Conclusions

This thesis project was part of a larger study, which focused on issues related to immigrant quality of life in Charlottetown, Prince Edward Island; Hamilton, Ontario; and, Saskatoon, Saskatchewan. S*ense of place* was used to evaluate the immigrant experience in these three cities. Understanding of immigrant *sense of place* provides insight into the emotional attachment that immigrants have established with their new home. Furthermore, it is suggested that a strong *sense of place* may aid in immigrant adaptation, providing a rationale for this research. The first paper in the thesis evaluated *sense of place* amongst immigrant and Canadian-born respondents in Hamilton, Saskatoon, and Charlottetown, furthering previous work conducted in Hamilton. The second paper within the thesis extended this research to determine the influence of *sense of place* on local environmental perceptions. It is acknowledged that the physical

environment is largely absent in *sense of place* literature, providing further rationale for this study (Stedman, 2003). The qualitative research focused on environmental perceptions of female immigrant and Canadian-born respondents, due to their higher perceptions of environmental risk (Flynn et al., 1994; Finucane et al., 2000) and characteristic greater concern for the environment (Stern et al., 1993; Momsen, 1999).

Further research might investigate the unique factors that contribute to Charlottetown's higher *sense of place*, and how this can be nurtured in other cities. This may be accomplished through a larger *sense of place* sample within the city, allowing for the creation of a city-specific regression model. Following the second paper, future research might address motivations for problem-focused and emotion-focused coping mechanisms. Research might also explore the relationship between immigrants' environmental perceptions based on their country of origin. Finally, it would be interesting to examine the influence of *sense of place* on environmental *behaviours* in response to environmental issues, reflecting the issue of sense of control mentioned above.

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LIST OF APPENDICES

1. MREB Ethics Form
2. MREB Clearance Form
3. Telephone Survey
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8. Qualitative Codes/Themes
9. Knowledge Transfer
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Appendix 1

MREB Ethics Form

McMaster University Research Ethics Board (MREB)
FACULTY/GRADUATE/UNDERGRADUATE/STAFF
APPLICATION TO INVOLVE HUMAN PARTICIPANTS IN
RESEARCH
[Behavioural / Non-Medical]

Date: April 1, 2013	Application Status: New [X] Change [ ]	Protocol #:

SECTION A – GENERAL INFORMATION

1. Study Titles: (Insert below)

TITLE: Perceptions of air pollution, coping strategies, and sense of place across immigrant status and gender in Northeast Hamilton, Ontario
(a): **Title:** (If different from above i.e. the grant title.)

2. **Investigator Information:**

	Full Name	**Department** *& or name of university if different from McMaster*	**telephone number(s) & Extension**	**E-mail address** *(Address you regularly use)*
Student Investigator(s)*	Melissa Gallina	School of Geography and Earth Sciences	28617	gallinma@mcmaster.ca
Faculty Supervisor(s)*	Dr. Allison Williams	School of Geography and Earth Sciences	24334	awill@mcmaster.ca

3. **Start dates and end dates:**

(a) **What is the date you plan to <u>begin</u> recruiting participants or obtain their permission to review their private documents?**

April 15th, 2013

(b) **What is the estimated <u>completion </u>date for data collection with human participants?**

June 30th, 2013

4. Indicate the location(s) where the research will be conducted.

(a) McMaster University   **[   ]**
(b) Community   **[X]** Specify Site(s): Eva Rothwell Resource Centre
(c) Hospital   **[   ]** Specify Site(s)
(d) Outside of Canada   **[   ]** Specify Site(s)
(e) School Boards   **[   ]** Specify Site(s)
(f) Other   **[   ]** Specify Site(s)

5. **Other Research Ethics Board Clearance**
(a) Are researchers from outside McMaster also conducting this research? If yes, please provide their information in Section 2 above.
[   ] Yes   [X] No

(b) Has any other institutional Research Ethics Board cleared this project?
[   ] Yes   [X] No

(c) If **Yes** to (5b), please complete the remainder of this application form and provide the following:
 (i.) A copy of the complete application submitted to the other institution together with **all** accompanying supporting documents including all communication between the researcher and that ethics review board and any changed documents or changed procedures made to the original research plan.

 (ii.) Provide a copy of the ethics clearance certificate /approval letter.

(iii.) Please provide the following information:

Title of the project cleared elsewhere

Name of the other institution: **Name of the other board**:   **Date of the other ethics review board's decision**:   **Contact name & phone number for the other board**:

(e) Will any other Research Ethics Board(s) or equivalent be asked for clearance?
[ ] Yes   [X] No
If yes, please provide the name and location of board(s*).*

6. **Research Involving Canadian Aboriginal Peoples** i.e., First Nations, Inuit and Métis (Check all that apply)
(a) Will the research be conducted on Canadian Aboriginal lands?   **[ ] Yes   [X] No**

(b) Will recruitment criteria include Canadian Aboriginal identity as either a factor for the entire study or for a subgroup in the study?
     [ ] Yes   [X] No

(c) Will the research seek input from participants regarding a Canadian Aboriginal community's cultural heritage, artifacts, traditional knowledge or unique characteristics? **[ ] Yes   [X] No**

(d) Will research in which Canadian Aboriginal identity or membership in an Aboriginal community be used as a variable for the purpose of analysis of the research data?   **[ ] Yes   [X] No**

(e) Will interpretation of research results refer to Canadian Aboriginal communities, peoples, language, history or culture?
          [ ] Yes   [X] No

7. **Level of the Project** (Check all that apply)
[ ] Faculty Research **[ ]** Post-Doctoral   **[ ]** Ph.D.   **[ ]** Staff/Administration
[ ] Master's (Major Research Paper - MRP)**[X]** Master's (Thesis)

[ ] Undergraduate (Honour's Thesis)   [ ] Undergraduate
(Independent Research)
[ ] Other (specify)

8. **Funding of the Project**
(a) Is this project currently being funded?   **[X] Yes   [ ] No**
(b) If **No**, is funding being sought?   **[ ] Yes   [ ] No**
(c) Period of Funding: **From:** [04/01/2012]   **To:** [08/30/2014]
                                (mm/dd/yyyy)   (mm/dd/yyyy)

(d) Agency (funded or applied to) & agency number (i.e., number assigned by agency) if applicable. (This is not your PIN number). For help in determining your "agency number" please click this < link >
[ ] CIHR & agency #   [ ] NSERC & agency #
[X] SSHRC & agency #808-2011-0005*   [ ] ARB & agency #
[ ] Health Canada & agency #   [ ] CFI & agency #

[ ] Canada Graduate Scholarship & Agency #
[ ] Post Graduate Scholarship & Agency #
[ ] USRA & grant #   [ ] Other (specify):

This research will be funded by Dr. Allison Williams' SSHRC Grant: Immigration and the Metropolis – Strategic Research Grant.

(e): Are you requesting ethics clearance for a research project that was <u>not</u> originally designed to collect data from human participants or their records (i.e., your research project originally did not involve collecting data from humans or their records) but you now intend to do so?   **[ ] Yes [X] No**

9. **Conflicts of Interest**

   (a) Do any researchers conducting this study, have multiple roles with
       potential participants (e.g., acting as both researcher and as a therapist,
       health care provider, family member, caregiver, teacher, advisor,
       consultant, supervisor, student/student peer, or employer/employee or
       other dual role) that may create real, potential, or perceived conflicts,
       undue influences, power imbalances or coercion, that could affect
       relationships with others and affect decision-making processes such as
       consent to participate?
                [ ] Yes   [X] No

(b) Will the researcher(s), members of the research team, and/or their partners or immediate family members:

   (i) receive any personal benefits (for example a financial benefit such as remuneration, intellectual property rights, rights of employment, consultancies, board membership, share ownership, stock options etc.) as a result of or being connected to this study?   **[   ] Yes   [X] No**

SECTION B – SUMMARY OF THE PROPOSED RESEARCH

10. **Rationale**
For the proposed research, please describe the *background* and the *purpose* concisely and in lay terms, as well as any overarching research questions or hypotheses to be examined.

> Two of Canada's largest steel mills are located in Hamilton, Ontario, resulting in high levels of air pollution in the northeast end of the city (Buzzelli et al., 2003; Buzzelli & Jerrett, 2004). Using the framework of environmental stress and coping theory, I plan to conduct an exploratory study examining individual perceptions of air pollution in northeast Hamilton. According to this theoretical approach, when individuals are faced with environmental stress, they appraise the issue and react by employing one of two coping methods: problem-focused coping (taking actions to mitigate the impacts of the stressor) or emotion-focused coping (regulating one's emotional response to the stressor) (Baum et al., 1982; Elliott et al., 2007; Wakefield et al., 2001). Furthermore, I plan to explore whether perceptions of air pollution and chosen coping strategies are informed by individual evaluations of sense of place (SoP).
>
> The research question for this project is: **How do perceptions of air pollution and resulting coping strategies vary according to immigrant status and gender in Northeast Hamilton, and are they informed by sense of place?** There are three objectives associated with this research project: (1) to compare perceptions of air pollution across immigrant status and gender; (2) to investigate perceptions and coping strategies, whether problem-based or emotion-based, associated with air pollution across immigrant status and gender; (3) to determine if evaluations of SoP inform perceptions and coping strategies associated with air pollution.

11. **Methods**

Describe <u>sequentially, and in detail, the methods to be used</u>. Include all data collection procedures in which the research participants will be involved (e.g., paper and pencil tasks, interviews, focus groups, lab experiments, participant observation, surveys, physical assessments etc. —*this is not an exhaustive list*). Include information about who will be conducting the research, how long it will take, where data collection will take place, and the form in which the data will be collected (e.g., computer responses, handwritten notes, audio/video/photo recordings etc.). If your study will be conducted with several sub-populations or progress and expand in successive phases, please organize your information using sub-headings.

<u>Quantitative Methods*</u>

A sequential mixed-methods approach will be employed. Quantitative data will be obtained from a telephone survey conducted in the summer of 2012, addressing quality of life in Hamilton (n=716). Quantitative analysis will be used to determine if there is a significant difference between evaluations of SoP in each group (immigrant men, immigrant women, Canadian-born men, and Canadian-born women). In addition to comparing overall SoP, evaluations of the statement 'environmental problems in my neighbourhood negatively influence my health' will also be compared across immigrant status and gender.

The larger quality of life survey was conducted as part of Dr. Williams' larger research project, funded by SSHRC. The larger research project has received ethics approval: MREB#2012 072 Immigrants' Quality of Life: Relationship to Adaptation in Three Canadian Cities A. Williams Geography M. Gallina.

<u>Qualitative Methods</u>

Key Informant Interviews

Three to five key informant interviews will be used to: verify the project's findings to date; confirm topics for discussion in the focus groups, and; ensure that the research project does not contain any significant gaps. Key informants may include: individuals from local neighbourhood associations, and Environment Hamilton. Key informant interviews will last approximately 1 hour and will occur in the participant's office.

Focus Groups

Four focus groups will be conducted: immigrant males, immigrant females, Canadian-born males, and Canadian-born females. Focus group participants will

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complete the 16-item SoP survey, distributed as part of the larger survey, allowing for the triangulation of the quantitative and qualitative results. . Focus groups will last approximately 1.5 hours. Focus groups will be held at an accessible community location, the Eva Rothwell Resource Centre.
(See appendices VII, VIII, IX, X)

Melissa Gallina will conduct all research, under the supervision of Dr. Williams. With permission of the participants, both the interviews and focus groups will be audio-recorded and notes will be taken.

12. Secondary Use of Identifiable Data

(a) Do you plan on using identifiable data of participants in your research for which the original purpose that data was collected is different than the purpose of your current research project?**[   ] Yes   [X] No**

13. **Experience**

What is your experience with this kind of research? Include information on the experience of all **individual**(s) who will have contact with the research participants or their data. ***For example, experience could include your familiarity with the proposed methods, the population(s) and/or the research topic or issues.***

I, the student research, am currently enrolled in a graduate-level qualitative research methods class. This class will equip me with the necessary tools in order to construct interview schedules, conduct qualitative research and, analyze qualitative results results. In addition, I am currently working as a research assistant for Dr. Williams. As a research assistant, I have aided in the implementation and analysis of other focus groups. Furthermore, I have completed an in-depth literature review entitled: *Immigrant Outcomes in Canada: A Focus on Second and Third Tier Cities*. In doing so, I have become familiar with both the population under study and the research topic.

Dr. Allison Williams, the research supervisor, has a large amount of experience in conducting qualitative research. During the course of the project, Dr. Williams will provide guidance and expertise.

14. **Participants**

Please describe:

(a) the number of participants required for this study

(b) any salient characteristics (e.g., age, gender, location, affiliation, etc.)

> *Key Informant Interviews*
> a) 3-5 participants will be required for key informant interviews.
> b) Participants will be selected based on the criteria that they are: (1) familiar with the issues surrounding air pollution in North-east Hamilton and, (2) involved in a local community organization.
>
> *Focus Groups*
> a) 6-8 participants will be required for each of the 4 focus groups.
> b) The composition of the groups will be: immigrant males, immigrant females, Canadian-born males and, Canadian-born females. Immigrants are defined as individuals not born in Canada; a mix of ethno-cultural backgrounds will be included. All participants must be literate in English, and have resided in North-east Hamilton for six or more years.

15. **Recruitment**

Please describe:

(a) how each type of participant will be recruited

(b) who will recruit participants

(c) the relationship (if any) between the investigator(s) and participant(s) (e.g. instructor-student; manager-employee, family member, student peers, fellow club members, no relationship etc.)

(d) any permission you have or intend to obtain, for your mode of recruitment (if applicable)

> *Key Informant Interviews*
> a) Potential key informants will be contacted directly via email. As potential recruits belong to local community organizations, their email addresses are publicly available. (see appendix III)
> b) Melissa Gallina will recruit key informants via email.
> c) There is no relationship between the investigator and the participants.
> d) N/A
>
> *Focus Groups*
> a) As part of the larger telephone survey, respondents were asked to indicate

whether they would be willing to participate in a follow-up qualitative study. Melissa will review the list of those who indicated that they would be willing to participate, and recruit individuals who meet the above criteria (by phone).

In order to supplement recruitment from the survey results, Melissa will approach local community organizations (ex. Eva Rothwell Resource Centre) to assist with further recruitment. Eva Rothwell Resource Centre will assist with the recruitment and will host the focus groups. Eva Rothwell will also host an information booth, where Melissa will distribute handouts (smaller printouts of app I) and ask individuals to sign up for the focus groups. In addition to displaying recruitment posters within the centre, Eva Rothwell can post appendix I on their public Facebook page.

This organization will play a more central role than other organizations. Other community organizations will be approached to assist with recruitment via posters. Potential organizations include: North Hamilton Community Health Centre; Environment Hamilton; St. Matthew's House; Mission Service; Norman Pinky Lewis Recreation Centre.

(see appendices I, II, IV)

b) Melissa Gallina will contact survey respondents directly. Melissa will provide community organizations with posters.

c) There is no relationship between the investigator and the participants.

d) Permission of local community organization will be obtained prior to poster distribution.

16. **Compensation**

	Yes	No
(a) Will participants receive compensation for participation?	**[X]**	[ ]
Financial	[ ]	[ ]
Other (specify)	**[X]**	[ ]

(b) If yes was answered for any of the above choices, please provide details.

Focus group participants will receive a gift card for a local grocery store ($25). Participants will also be provided with refreshments during the focus group. Key informants will not receive compensation.

(c) If participants choose to withdraw, how will you deal with their compensation?

Participants will still receive their compensation even if they choose to withdraw from the study. Upon withdrawal, participants will be provided with the full amount gift card.

SECTION C – DESCRIPTION OF THE RISKS AND BENEFITS OF THE PROPOSED RESEARCH

17. **Possible Risks**
(a) Indicate if the participants might experience any of the following risks:

    i.) Physical risk (including any bodily contact or administration
    of any substance)?   **[ ] Yes
[X] No**

    ii.) Psychological risks (including feeling demeaned, embarrassed
    worried or upset)?   **[X]
Yes   [ ] No**
    iii.) Social risks (including possible loss of status, privacy and / or
    reputation)?   **[X]
Yes   [ ] No**

    iv.) Are any possible risks to participants greater than those the
    participants might encounter in their everyday life?   **[X]
Yes   [ ] No**

(b) If you checked **yes** for any of questions **i – iv** above, please describe the risk(s) in the space below.

Key Informant Interviews
ii) Psychological risks:
-Participants will be asked about their opinions, which may differ from the views of their organization. Participants may feel uncomfortable expressing their views if they are competing with those of the larger organization.

iii) Social risks:
-Participants may fear that their position as a public figure will make them easily indefinable. Participants may feel uncomfortable in the interview if they believe

that they may be identified by their words/views.

iv) Risk encountered in daily life:
-Though the risks of this study are relatively minor, they still represent risks that participants may not typically encounter in their everyday life.

Focus Groups
ii) Psychological risks:
-Participants may not have previously considered the association between air pollution and health. As a result, they may be worried about the potential impacts that air pollution can have on their health.
-Participants may feel that they are being stigmatized, as they live in a low-income area with high levels of air pollution. This may cause participants to have a decreased sense of worth.

iii) Social risks:
-Participants may feel uncomfortable sharing their experiences in a group setting. Immigrants are members of specific communities and therefore, may know other individuals in the group, causing them to be embarrassed.

iv) Risk encountered in daily life:
-Though the risks of this study are relatively minor, they still represent risks that participants may not typically encounter in their everyday life.

(c) Management of Risks: Describe how each of the risks identified above will be managed or minimized. Please, include an explanation regarding why alternative approaches cannot be used.

Key Informant Interviews
ii) Psychological risks:
-The student researcher will stress that the study is focusing on individual opinions, rather than those of the organization. Individual identities will not be linked to specific organizations. As mentioned later, participants will be assigned a participant number (if they so choose). Participants will be referred to by this number rather than their name.

iii) Social risks:
-Again, participants will have the option to remain anonymous. Information that

could be used to identify an individual (ex. position, age, gender) will be excluded from dissemination.

iv) Risk encountered in daily life:
-If participants are uncomfortable with the risk of being involved in the research, they may choose to withdraw at any time, with no consequence to them.

Focus Groups
ii) Psychological risks:
-The student researcher will emphasize that, though the participants are exposed to a high level of air pollution, this is through no fault of their own. It will be stressed that air quality issues are relevant to all Hamiltonians; it is an issue that we must address together. The student researcher will attempt to foster a sense of solidarity around this issue.

iii) Social risks:
-The participants will be asked to respect the privacy of fellow group members. Participants will be reminded at both the beginning and end of the focus group that: "what is said in the room, should remain in the room".

iv) Risk encountered in daily life:
-If participants are uncomfortable with the risk of being involved in the research, they may choose to withdraw at any time, with no consequence to them.

(d) Deception: Is there any deception involved in this research?   [ ]
Yes [X] No

18. **Possible Benefits**
Discuss any potential benefits to the scientific community/society that justify involvement of participants in this study.

This research is highly relevant at the societal level; policy implications include the potential inclusion of sense of place in local environmental assessments and regulations. This project will allow community members to voice their opinions on local environmental issues. In order to inspire action and the betterment of society, I plan to produce a community report, which will be disseminated to community partners.

SECTION D – <u>< THE INFORMED CONSENT PROCESS ></u>

19. **The Consent Process**

(a) Please describe <u>how consent will be documented</u>. Provide a copy of the Letter of Information and the consent form (if applicable) to be used.

If a written consent form will not be used to document consent, please explain why and describe the alternative means that will be used. While oral consent may be acceptable in certain circumstances, it may still be appropriate to provide a Letter of Information to participants about the study.

> Written consent will be obtained from all participants prior to the start of the interview/focus group.

(b): Please describe the <u>process</u> the investigator(s) will use to obtain informed consent, including <u>who</u> will be obtaining informed consent. Describe plans (if any) for on-going consent.

> Copies of the letter of information and consent form will be provided to participants for review via email/mail prior to the interview/focus group. Individuals will be given copies of the letter of information and consent form upon arrival to the interview/focus group. The participants will be given time to read the documents and ask questions if required. Melissa Gallina will obtain informed consent, via the consent forms. (see appendices V, VI)

20. **Consent by an authorized party**
If the participants are minors or for other reasons are not competent to consent, describe the proposed alternate source of consent.

>

21. **Alternatives to prior individual consent**

If obtaining written or oral documentation of an individual participant's consent prior to start of the research project is not appropriate for this research, please explain and provide details for a proposed alternative consent process.

22. **Providing participants with study results**

How will participants be able to learn about the study results? (e.g., mailed/emailed brief summary of results in plain language; posting on website or other appropriate means for this population).

Upon completion of the study, the student research plans to hold a community workshop for focus group participants. During this workshop, Melissa will distribute the study results in an interactive manner. In addition, Melissa will create a summary of results ("community report") that will be distributed to all participants. Individuals can indicate on the consent form if they would like to receive this report by mail or email.

23. **Participant withdrawal**

a) Describe how the participants will be informed of their right to withdraw from the project. Describe the procedures which will be followed to allow the participants to exercise this right.

Participants will be informed of their right to withdraw from the project when they first receive the LOI/consent form. Participants will be reminded of their right to withdraw at the beginning of the interview/focus group. Participants can choose to withdraw at any point during the discussion. After the discussion, participants will have the opportunity to review the interview/focus group transcript. Participants can withdraw up to 2 weeks after the transcript is sent for review.

b) Indicate what will be done with the participant's data and any consequences which withdrawal might have on the participant, including any effect that withdrawal may have on the participant's compensation or continuation of services (if applicable).

Upon withdrawal, the participant's data will be deleted from the study, unless the individual indicates otherwise. Participants will be given the option to review the focus group transcripts to ensure that their data has been eliminated.

Participants will not face any consequences if they choose to withdraw from the

study. Upon withdrawal, participants will be provided with the full amount of compensation. Participants will be provided with this information when they are informed of their right to withdraw.

24. SECTION E – CONFIDENTIALITY & ANONYMITY

Confidentiality concerns the protection, privacy and security of research data. Consult the Data Security Checklist at http://reo.mcmaster.ca/educational-resources for best practices to secure electronic and hard copy versions of data and study documents.

(a) Will the data you collect be kept protected, private and secure from non-research team members?
[X] Yes [   ] No

 (b) Describe the procedures to be used to ensure that the data you collect in your research will be kept protected, private, and secure from non-research team members. In your description, explain who will have access to the data and what data security measures will be put in place during data transfer and data storage.

Data will be kept on the personal laptop and the office computer of Melissa Gallina. Both computers are password protected. Data will be stored in an encrypted file. These passwords are different from one another and will not be known by anyone other than Melissa.

Data will only be available to Melissa and her supervisor, Dr. Williams. Any data transmitted between Melissa and Dr. Williams will be encrypted and sent through the McMaster University email system.

Hard copies of data will be kept in the student researcher's office, which is locked at all times. As this is a shared office, Melissa will keep documents in a locked cabinet when not in use.

(c) Will the research data be kept indefinitely or will it be deleted after a certain time period? Please explain. In your answer, describe why you plan to keep data indefinitely or not. If deleting data after a certain time period, explain why you chose the time period you did. Describe how participants will be informed whether their data will be deleted or not.

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Research data will be kept for 5 years after completion of the project. Dr. Williams will be responsible for the safekeeping of data once Melissa has completed her MA program. The letter of information will explain that data will be kept for 5 years.

Anonymity concerns whether participant identities are made known or not. The anonymity promised to participants can be different during different stages of research (i.e., during recruitment, during data collection, during data storage, and during the dissemination of research findings).

(d) Describe the extent to which participant identities will be made known in <u>each</u> of the following activities: during <u>recruitment</u>, during <u>data collection</u>, during <u>data storage</u>, and during the <u>dissemination</u> of research findings. In your description, explain what steps or procedures you plan to put in place to keep participant identities unknown in each of those activities.

Key Informant Interviews
<u>Recruitment</u>: Key informant identities will be known due to the public nature of their roles.
<u>Data Collection</u>: Key informants will be given the choice whether or not they would like to remain anonymous. If participants choose to remain anonymous, they will be assigned a number. All data collected during the interview will be associated with this assigned number and not the participant's identity.
<u>Data Storage</u>: A master list of participant's identities and assigned numbers will be stored according to the procedures described above. This will be the only document containing information on both participant's identities and assigned numbers. Only Melissa and Dr. Williams will have access to this document.
<u>Dissemination</u>: Should informants choose to remain anonymous, participant identity will not be included in any reports, workshops or thesis papers that result from this project. As mentioned above, participants will only be referred to by their participant number.

Focus Groups
<u>Recruitment</u>: The researchers, due to information the participant chose to disclose during the survey, will know identities of participants recruited via the survey. Identities of those selected via the community organizations will not be known to the researchers. Individuals will only be asked for their first name during sign-up

(appendix IV).

Data Collection: At the beginning of the focus group, participants will be asked to complete a compensation log, in which they will be assigned a participant number (appendix VII). During the data collection phase, participants will be assigned a number. All data collected during the focus group will be associated with this assigned number and not the participant identity.

Data Storage: The compensation log, the only document that contains both participant identity and number, will be storage in a locked cabinet in Melissa's office. Only Melissa and Dr. Williams will have access to this document.

Dissemination: Participant identity will not be included in any reports, workshops or thesis papers that result from this project. As mentioned above, participants will only be referred to by their participant number.

SECTION F -- MONITORING ONGOING RESEARCH

25. **Adverse Events, Change Requests and Annual Renewal view**
    a) **Adverse events** (Unanticipated negative consequences or results affecting participants) must be reported by faculty researcher or supervisor to the REB Secretariat (Ethics Office – Ext. 23142) and the MREB Chair, as soon as possible and in any event, no more than 3 days after they occur. See: https://reo.mcmaster.ca/policies/copy_of_guidelines#12-0-adverse-events

    b) **Changes**: To obtain clearance for a change to a protocol that has already received ethics clearance, please complete the "**< Change Request >**" form available on the MREB website or by clicking this link. Such changes may not begin before they receive ethics clearance.

    c) **Ethics clearance is for only one year**. The minimum requirement for renewed clearance is the completion of a "Renewal/Project Completed" form at least 1 month in advance of the annual report to process the renewal. In this section please indicate whether any additional monitoring or review is appropriate for this project.

26. **ADDITIONAL INFORMATION**

(Use this section or an additional page if more space is required to
complete any part of this form, or if there is any other information relevant
to the project which you wish to provide to the Research Ethics Board.)

27. **POSTING OF APPROVED PROTOCOLS ON THE RESEARCH
ETHICS WEBSITE**
   a) Effective January 1, 2006, it is the policy of MREB to post a list of
      cleared protocols on the Research Ethics website. Posted information
      usually includes: title, names of principal investigators, principal
      investigator department, type of project (i.e. Faculty; PhD; Masters,
      Undergraduate etc.)
   b) You may request that the title be deleted from the posted information.
   c) Do you request that the title be eliminated from the posted
      information? **[   ] Yes [X] No**
   d) The ethics board will honour your request if you answer **Yes** to the
      above question **27 c**) but we ask you to provide a reason for making
      this request for the information of the Board. You may also use this
      box for any other special requests.
   e) < List of MREB Cleared Protocols > < List of Undergraduate SREC
      Cleared Protocols >

Supporting Materials Checklist:

Supporting Materials Checklist	I will use this type of material in my study (Insert X below)	I have attached a copy of this material in my protocol (Insert X below)	This is how I labeled and titled this material in my protocol (e.g., *Appendix A – "Email Recruitment Script for Organizational Workers"*)

Supporting Materials Checklist	I will use this type of material in my study *(Insert X below)*	I have attached a copy of this material in my protocol *(Insert X below)*	This is how I labeled and titled this material in my protocol (e.g., *Appendix A – "Email Recruitment Script for Organizational Workers"*)
Recruitment Materials			
Study Information Brochure			
Video/audio recording that explains study details			
Participant Screening Form			
Recruitment Advertisements			
Recruitment Poster	X	X	Appendix I: Recruitment Poster
Recruitment Script – Verbal/Telephone	X	X	Appendix II: Telephone Recruitment Script
Recruitment Script – Email (direct to participant)	X	X	Appendix III: Email Recruitment Script for Key Informants
Recruitment Script – Email (From holder of participant's contact information)			
Recruitment for follow-up interview			
Snowball Recruitment script			
Reminder/thank you/ card/script/email			
Appreciation Letter/certificate – For Participants			
Other			
Informed Consent Materials			

Supporting Materials Checklist	I will use this type of material in my study (*Insert X below)*	I have attached a copy of this material in my protocol (*Insert X below)*	This is how I labeled and titled this material in my protocol (e.g., *Appendix A – "Email Recruitment Script for Organizational Workers"*)
Consent Log (to record oral consent)			
Oral/Telephone Consent Script			
Letter of Information & Consent Form – **Participants**	X	X	Appendix V: Letter of Information & Consent (Focus Groups) Appendix VI: Letter of Information & Consent (Key Informants)
Letter of Information & Consent Form – **Parent**			
Letter of Information & Consent Form - **Guardian** or **Substitute Decision Maker**			
Letter of Information & Assent Form – **Minors**			
Online survey brief information/consent and implied consent buttons			
Letter of Support for Study			
Research Agreement			
Other			
Data Collection Materials			
Information Sharing/Data Access/Transfer Agreement			

Supporting Materials Checklist	I will use this type of material in my study (Insert X below)	I have attached a copy of this material in my protocol (Insert X below)	This is how I labeled and titled this material in my protocol (e.g., *Appendix A – "Email Recruitment Script for Organizational Workers"*)
(for secondary use of data)			
Demographic form - Participant's	X	X	Appendix X: Sense of Place Survey (demographic information added)
Instructions for participants			
Interview Guide – (Questions for face to face, telephone, Internet/email interview)	X	X	Appendix VIII: Key Informant Interview Questions
Interview Guide – Questions for Focus Groups	X	X	Appendix IX: Focus Group Interview Schedule
Questionnaire or Survey questions & instructions (Paper and pencil or online formats)	X	X	Appendix X: Sense of Place Survey (demographic information added)
Rating Scales/inventories/Assessment Instruments			
Role-play/simulation scripts			
Stimuli used to elicit responses			
Images (photos, diagrams etc.) depicting instruments, equipment, exercises etc.			

Supporting Materials Checklist	I will use this type of material in my study (*Insert X below*)	I have attached a copy of this material in my protocol (*Insert X below*)	This is how I labeled and titled this material in my protocol (e.g., *Appendix A – "Email Recruitment Script for Organizational Workers"*)
Other	X	X	Appendix IV: Participant Sign-up Sheet
Deception Materials			
Deception Study - Debriefing Letter & post debriefing consent form			
Deception Study- Debriefing script – verbal			
Other			
Confidentiality Materials			
Confidentiality Oath/ Agreement			
Confidential Study Code Key Log			
Other			
Materials for previous review by other REBs			
Application form –Other REBs (Original)			
Application form – Other REBs (Revised)			
Communication between REB & researcher (letters, emails, faxes etc.)			
Clearance Certificate (Other REBs)			

Supporting Materials Checklist	I will use this type of material in my study (*Insert X below)*	I have attached a copy of this material in my protocol (*Insert X below)*	This is how I labeled and titled this material in my protocol (e.g., *Appendix A – "Email Recruitment Script for Organizational Workers"*)
Other			
Other Supporting Materials			
Compensation Log	X	X	Appendix VII: Compensation Log
List of support services for participants			
Participant Appreciation - letter, script, email or certificate etc.			
Researcher Training Certificates			
Scientific Licenses			
Other			

< SECTION G – SIGNATURES >

28**. Faculty or Administrative Staff Researcher Assurance:**

[   ] *"I confirm that I have read the < McMaster University Research Ethics Guidelines and Faculty Handbook >, and I agree to comply with the conditions outlined in the Guidelines.*

_____

Signature of Faculty or Staff Investigator   PLEASE TYPE/PRINT NAME HERE   Date

29**. Graduate or Undergraduate Research Assurance:**

For graduate or undergraduate student research where:
[X] the supervisor is the primary supervisor for a dissertation, thesis or major research paper:
Or
[   ] the supervisor is not the primary supervisor, and where the research is not for a dissertation, thesis or major research paper (e.g., independent study, experiential learning etc.):

[   ] *"I confirm that I have read the <u>< McMaster University Research Ethics Guidelines and Faculty Handbook ></u>, and I agree to comply with the conditions outlined in the Guidelines.*

[   ] *"I have read the application and proposal and deem the project to be valid and worthwhile, and I agree to provide the necessary supervision of the student(s) and to make myself available should problems arise during the course of the research."*
Allison Williams

Signature of Faculty Supervisor **PLEASE TYPE/PRINT NAME HERE**
   Date

   Melissa Gallina

Signature of Student **PLEASE TYPE/ PRINT NAME HERE**
   Date

Appendix 2

MREB Clearance Form

McMaster University Research Ethics Board (MREB)
c/o Research Office for Administrative Development and Support, MREB Secretariat, GH-305, e-mail: ethicsoffice@mcmaster.ca

CERTIFICATE OF ETHICS CLEARANCE TO INVOLVE HUMAN PARTICIPANTS IN RESEARCH

Application Status: New ☑ Addendum ☐ Project Number: 2013 071

TITLE OF RESEARCH PROJECT:

Perception of air pollution, coping strategies, and sense of place across immigrant status and gender in North East Hamilton, Ontario

Faculty Investigator(s)/ Supervisor(s)	Dept./Address	Phone	E-Mail
A. Williams	Geography	24334	awill@mcmaster.ca

Student Investigator(s)	Dept./Address	Phone	E-Mail
M. Gallina	Geography	28617	gallinma@mcmaster.ca

The application in support of the above research project has been reviewed by the MREB to ensure compliance with the Tri-Council Policy Statement and the McMaster University Policies and Guidelines for Research Involving Human Participants. The following ethics certification is provided by the MREB:

☐ The application protocol is cleared as presented without questions or requests for modification.

☑ The application protocol is cleared as revised without questions or requests for modification.

☐ The application protocol is cleared subject to clarification and/or modification as appended or identified below:

COMMENTS AND CONDITIONS: Ongoing clearance is contingent on completing the annual completed/status report. A "Change Request" or amendment must be made and cleared before any alterations are made to the research.

Reporting Frequency:	Annual: Apr-30-2014	Other:

Date: Apr-30-2013   Chair, Dr. B. Detlor / Vice Chair, C. Anderson:

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Appendix 3

Telephone Survey[2]

Interviewer: Do not ask, but record sex:					
Male 1	Female 2				
Do you or a member of your household own or rent the dwelling you live in?					
Own 1	Rent 2				
How long have you lived in this, or a nearby neighbourhood?					
Less than 1 year 1	1-5 years 2	5-10 years 3	Over 10 years 4	Refused/Don't Know 99	
A. Overall Quality of Life					
A1. How would you describe your overall quality of life? Would you say it is…					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B. Quality of Life					
Next, I am going to read you a list of conditions and services that affect quality of life in your neighbourhood and city. I would like you to rate each condition as excellent, very good, good, fair or poor.					
B1. …the condition of roads and sidewalks in your neighbourhood.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B2. …the condition of housing in your neighbourhood.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B3….the affordability of housing (including rental units) in your neighbourhood.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B4. ...the condition of parks in your neighbourhood.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B5. …public transportation in the city.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99

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[2] Questions used for this analysis are highlighted in grey

B6. …traffic conditions in the city.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B7. …degree of neighbourhood neatness (such as amount of litter or graffiti)					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B8. The quality of schools in your neighbourhood.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99

B9. The quality of health services in the city.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B10. The quality of recreation programs & services in your neighbourhood.					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B11. How do you rate your neighbourhood as walkable? (e.g. being able to safely and quickly walk to stores, parks and services?)					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B12. How do you rate your access to reasonably priced, fresh food (e.g. vegetables, fruit, and meat) in your neighbourhood?					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B13. How do you rate air quality in your neighbourhood?					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
B14. …during the past year, has air quality affected your decision to participate in outdoor activities such as sports, recreation, leisure or doing errands?					
Often 1	Sometimes 2	Never 3	Don't Know 99		
B15. Over the last 3 years, would you say the quality of life in your city has:					
Improved 1	Stayed the same 2	Become worse 3	Don't Know 99		
B16. With respect to 'quality of life', do you think things in your city are					

generally going in the right, or in the wrong direction?					
Right direction 1	Wrong direction 2	Don't Know 99			
C. Health and Belonging					
The next few questions are about your personal health and your sense of belonging.					
C1. In general, would you say your health is:					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99
C2. In general, would you say your mental health is:					
Excellent 1	Very good 2	Good 3	Fair 4	Poor 5	Don't Know 99

C3. Thinking about the amount of stress in your life, would you say that most days are:					
Not at all stressful 1	Not very stressful 2	A bit stressful 3	Quite a bit stressful 4	Extremely Stressful 5	Don't Know 99
C4. How would you describe your sense of belonging to your local community? Would you say that it is:					
Very strong 1	Somewhat strong 2	Somewhat weak 3	Very weak 4	Don't Know 99	
D. Where you live					
The following statements and questions have to do with your feelings about your neighbourhood in general. For each, indicate the degree to which you agree or disagree.					
D1. My neighbourhood means a great deal to me.					
Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	
D2. There's no other neighbourhood I would rather live.					
Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	
D3. I feel at home in my neighbourhood.					

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

D4. There are people in my neighbourhood who I think of as close friends.

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

D5. I would like to stay in my neighbourhood as long as my health allows me to do so.

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

D6. Green space availability in my neighbourhood positively influences my health.

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

D7. Environmental problems in my neighbourhood (e.g. air pollution, run-down buildings) negatively influences my health.

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

D8. Social problems in my neighbourhood (e.g. racism, violence) negatively influence my health.

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

D9. The personal safety of myself and my family in my neighbourhood negatively affects my health

Strongly agree 1	Agree 2	Neutral 3	Disagree 4	Strongly disagree 5	

How true are the following two statements?

D10. I know many of my neighbours on a first name basis.

Very true 1	Fairly true 2	Neutral 3	Not very true 4	Not at all true 5	

D11. If I were to live somewhere else, it would be difficult to move away from my neighbourhood.

Very true	Fairly true	Neutral	Not very	Not at all	

1	2	3	true 4	true 5	
I would like to ask you several more questions on how you feel about your neighbourhood.					
D12. Over the last 3 years, would you say the quality of life in your neighbourhood is:					
Getting better 1	Staying the same 2	Becoming worse 3	Don't Know 99		
D13. How rooted to you feel in your neighbourhood?					
Very rooted 1	Fairly rooted 2	Neutral 3	Not very rooted 4	Not at all rooted 5	
D14. How connected do you feel to your neighbourhood?					
Very connected 1	Fairly connected 2	Neutral 3	Not very connected 4	Not at all connected 5	
D15. How much do you like your neighbourhood?					
A great deal 1	A fair amount 2	Neutral 3	Not very much 4	Not at all 5	
D16. How often do you participate in social activities with your neighbours (e.g barbeques, coffee dates, etc)					
All the time 1	Often 2	Sometimes 3	Hardly ever 4	Never 5	
D17. If you had to leave your neighbourhood, how many of your neighbours would you miss?					
Many of them 1	Some of them 2	Neutral 3	Hardly any of them 4	None of them 5	

E. Social Capital				
Referring to the community you live in, I would now like to ask you four questions about trust and interaction with others. The scale ranges from 1 to 4.				
E1. Do you feel safe walking down your street after dark?				
No, not much 1	2	3	Yes, very much 4	
E2. Do you agree that most people can be trusted?				
No, not much			Yes, very much	

1	2	3	4	
E3. Can you get help from friends when you need it?				
No, not at all 1	2	3	Yes, definitely 4	
E4. Do you think that multiculturalism makes life in your area better?				
No, not at all 1	2	3	Yes, definitely 4	
I would now like to ask you 2 questions about your involvement in the community.				
E5. In the past 12 months, did you do unpaid volunteer work for any organization?				
Yes 1	No 2			
E6. Did you vote in the last municipal election?				
Yes 1	No 2			

F. Care-Giving				
F1. Do you look after someone who is frail or disabled and can't look after themselves? Interviewer: If answer is 'No' proceed to Section G.				
Yes 1	No 2			
F2. How do you feel about your care-giving role? Would you say it is…				
Very burdensome 1	Somewhat burdensome 2	Manageable 3	Not burdensome 4	Don't Know 5
F3. If you receive care-giving services, such as homecare, how are these services paid for?				
Government funded 1	Privately (out of pocket) 2	Other 3	Don't Know 4	
With respect to care-giving, how true are the following statements?				
F4. I can always manage to solve difficult problems if I try hard enough.				
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4	
F5. If someone opposes me, I can find the means and ways to get what I want.				
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4	

F6. It is easy for me to stick to my aims and accomplish my goals.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F7. I am confident that I could deal efficiently with unexpected events.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F8. Thanks to my resourcefulness, I know how to handle unforeseen situations			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F9. I can solve most problems if I invest the necessary effort.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F10. I can remain calm when facing difficulties because I can rely on my coping abilities.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F11. When I am confronted with a problem, I can usually find several solutions.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F12. If I am in trouble, I can usually find a solution.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
F13. I can usually handle whatever comes my way.			
Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4

G. Demographics						
Now I am going to ask you a few questions about yourself. Please be assured again that your answers are confidential and will not be reported in any way that could be traced back to you.						
Age						
G1. Please stop me when I come to the age category that you fit into:						
18-24 1	25-34 2	35-44 3	45-54 4	55-64 5	65-74 6	75 and over 7
Immigrant Status						
G2. Were you born in Canada? Interviewer: If the response is Yes go to question G4.						
Yes 1	No 2	Refused 99				
G3. How long have you lived in Canada?						
Less than 1	1-5 years	6-10 years	Over 10	Refused		

year 1	2	3	years 4	99	

Citizenship (all respondents should be asked this question regardless of the answer in G1).

G4. Are you a Canadian Citizen?

Yes 1	No 2		

Marital Status

G5. What is your marital status?

Single/never married 1	Married, common law, or living with a partner 2	Separated/Divorced 3
Widowed 4	Refused 99	

G6. Which of the following best describes your current living arrangement:

Unattached individual living alone 1	Unattached individual living with others 2	Couple living with children (children of any age) 3
Couple living alone 4	Lone-parent 5	Other 6

Education

G7. What is your current level of education?

Less than high school 1	High school diploma 2	Some college or university 3
College or trade school diploma or certificate 4	University graduate 5	Refused 99

Employment

G8. During the past 12 months were you mainly….?

Working full time 1	Working part-time 2	Unemployed 3
Retired 4	Homemaker/caregiver 5	Student 6
On disability/maternity leave 7	Refused 99	

Income

G9. What is your total, annual household income before taxes?

Less than $20,000 1	$20,000-$39,999 2	$40,000-$59,999 3

| $60,000-$79,999 4	$80,000-$99,999 5	$100,000 or more 6
Refused/Don't Know 99		
Housing		
G10. What type of dwelling do you live in?		
Single detached home 1	Semi-detached/duplex 2	Row/Townhouse 3
Low rise apartment (less than 5 stories) 3	High rise apartment (5 or more stories) 4	Other 5
Don't Know 99		

Other Demographic Questions					
G11. How many children **under age 18** do you have living with you?					
None 0	One 1	Two 2	Three 3	4 or more 4	Refused 99
Permission For Follow-Up Interview					
In the coming months we may be contacting respondents to participate in face-to-face interviews dealing with neighbourhood quality of life in your city. The interview will take about 1 hour and you will be asked questions on issues such as housing, transportation, parks and green space, health and community services. When you are contacted you can decide if you would like to participate or not. Are you interested in being on this list of potential participants?					
Yes		No			
If yes, interviewer: please ask for name and phone number.					

Appendix 4

Recruitment Poster

PARTICIPANTS NEEDED FOR
RESEARCH ON PERCEPTIONS OF AIR
POLLUTION IN HAMILTON
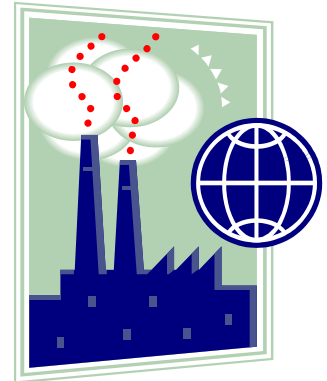
We are looking for volunteers to take part in a study of
**Perceptions of Air Pollution and Coping Strategies in northeast Hamilton,
Ontario**

You would be asked to:

- *Participate in a focus group session at the Eva Rothwell Resource Centre (about 1.5 hours)*
- *Complete a short survey during the focus group*
- *All participants must be comfortable speaking English*

In appreciation for your time, you will receive
a $25 gift card to a local grocery store.

For more information about this study, or to volunteer for this
study, please contact: *Melissa Gallina*
School of Geography and Earth Sciences, McMaster University
905-525-9140 Ext. 28617 or
Email: *gallinma@mcmaster.ca*

1) Mon. June 17th – Canadian-born Females
2) Tues June 18th – Canadian-born Males
3) Mon. June 24th – Immigrant Females
4) Tues. June 25th – Immigrant Males

**This study has been reviewed by, and received ethics clearance
by the McMaster Research Ethics Board.**

Appendix 5

Letter of Information/Consent

A Study about: Perceptions of Air Pollution and Coping Strategies in Hamilton, ON

Investigators:

Faculty Supervisor:	**Student Investigator:**
Dr. Allison Williams	Melissa Gallina
SGES	SGES
McMaster University	McMaster University
Hamilton, Ontario, Canada	Hamilton, Ontario, Canada
(905) 525-9140 ext. 24334	**(905) 525-9140 ext. 28617**
E-mail: awill@mcmaster.ca	E-mail: gallinma@mcmaster.ca

Research Sponsor: Social Sciences and Humanities Research Council

Purpose of the Study

You are invited to take part in this study on perceptions of air pollution and coping strategies in Hamilton, ON. I want to determine the perceptions of air quality among residents of northeast Hamilton. I am hoping to learn how individuals evaluate and cope with air pollution and whether this varies by immigrant status and gender. I also want to explore the concept of "sense of place" and determine if feelings of sense of place influence the evaluation of and reaction to air pollution. Sense of place refers to one's feelings about where they live.

I am conducting this research for a Master's thesis project within the School of Geography and Earth Sciences at McMaster University, under the supervision of Dr. Allison Williams.

What will happen during the study?

You will be asked to participate in a focus group lasting about 1.5 hours. Focus groups will be held at the Eva Rothwell Resource Centre. You will be asked questions about air quality and attachment to your neighbourhood, and you will be asked to complete a short survey about your attachment to the neighbourhood. I will also ask you for some background information like your age and length of residence in the neighbourhood. With your permission, I would like to take handwritten notes and audio-tape the focus group.

Are there any risks to doing this study?

The risks involved in participating in this study are minimal. You may find it stressful to discuss the air quality in your neighbourhood and potential negative health impacts. You may worry about how others will react to what you say or that other members of the focus group will share your information.

You do not need to answer questions that you do not want to answer or that make you feel uncomfortable. All members of the focus group will be asked to remember that 'what is said in the room stays in the room'. You can withdraw (stop taking part) at any time. I describe below the steps I am taking to protect your privacy.

Are there any benefits to doing this study?

This project will allow community members to voice their opinions on local environmental issues. In order to inspire action and the betterment of society, I plan to produce a community report and host a community workshop.

Payment or Reimbursement

As compensation for participating in this study, you will receive a gift card for a local grocery store ($25).

Who will know what I said or did in the study?

Every effort will be made to protect (guarantee) your confidentiality and privacy. I will not use your name or any information that would allow you to be identified. However, we are often identifiable through the stories we tell. We will undertake

to safeguard the confidentiality of the discussion. We ask the other members of the focus group to keep what you say confidential, but we cannot guarantee that they will do so.

The information you provide will be kept in a locked drawer, in a locked office, where only my supervisor and myself will have access to it. Information kept on a computer will be protected by a password and encrypted. Upon completion of the study the data will be kept for 5 years. After this time has elapsed, the data will be destroyed.

What if I change my mind about being in the study?

Your participation in this study is voluntary. If you decide to be part of the study, you can stop (withdraw), from the focus group for whatever reason, even after signing the consent form or part-way through the study. If you decide to withdraw, there will be no consequences to you. If you do not want to answer some of the questions you do not have to, but you can still be in the study. Upon completion of the focus group, you will be provided with a transcript for review. Withdrawal may occur up to two weeks after you receive the transcript. After this time, withdrawal will not be possible.

How do I find out what was learned in this study?

I expect to have this study completed by the summer of 2014. If you would like a brief summary of the results, please let me know how you would like it sent to you. You may also have the opportunity to attend a workshop to learn about and discuss the results of the project.

Questions about the Study

If you have questions or need more information about the study itself, please contact me at:
(905) 525-9140 ext. 28617   E-mail: gallinma@mcmaster.ca

This study has been reviewed by the McMaster University Research Ethics Board and received ethics clearance.
If you have concerns or questions about your rights as a participant or about the way the study is conducted, please contact:

McMaster Research Ethics Secretariat
Telephone: (905) 525-9140 ext. 23142
c/o Research Office for Administrative Development and Support
E-mail: ethicsoffice@mcmaster.ca

CONSENT

- I have read the information presented in the information letter about a study being conducted by Melissa Gallina of McMaster University.
- I have had the opportunity to ask questions about my involvement in this study and to receive additional details I requested.
- I understand that if I agree to participate in this study, I may withdraw from the discussion at any time or until two weeks after I received the interview transcript.
- I have been given a copy of this form.
- I agree to participate in the study.

Signature: _____

Name of Participant (Printed) _____

1. I agree that the focus group can be audio recorded.
… Yes.
… No.

2. …Yes, I would like to receive a summary of the study's results.
Please send them to this email address
_____

     Or to this mailing address:

     _____

     _____

… No, I do not want to receive a summary of the study's results.

3. I would be interested in attending a community workshop to learn about and discuss the study's results.
... Yes. Please contact me at:
_____
... No.

Appendix 6

Focus Group Interview Guide

Perceptions of Air Pollution and Coping Strategies in Hamilton, ON Melissa Gallina, (Master of Arts student) (Department of Geography – McMaster University)

[THE COMPLETION OF THE INTRODUCTORY SECTION OF THE FOCUS GROUP SHOULD TAKE APPROXIMATELY 10-15 MINUTES]

I) INTRODUCTION AND INSTRUCTIONS:

Hello, my name is Melissa Gallina. Thank you for agreeing to participate in this focus group meeting. Just to remind everyone, I'm looking at opinions about air quality in the neighbourhood.

[POINT OUT REFRESHMENTS if available, NAME TAGS if used – people should use their first name or pseudonym only].

In a minute, we will all introduce ourselves – first names only. But first, I would like to walk you through the consent form that is in front of you.

[FOR FACILITATOR: REVIEW INFORMED CONSENT FORM AND ANSWER ANY QUESTIONS ABOUT IT. COLLECT SIGNED CONSENT FORMS AND ENSURE THAT PARTICIPANTS HAVE A COPY OF THE LETTER OF INFORMATION TO TAKE WITH THEM (IF APPROPRIATE FOR THE TOPIC AND GROUP).

Confidentiality: *[READ ALOUD] Before* we begin our discussion of air pollution and coping strategies, I want to spend a few moments **talking about confidentiality** and to go over some basic ground rules for our focus group discussion today:

- Everyone's views are welcomed and important. Everyone's opinions and views are to be respected. The focus group is a safe space to express your individuals opinions and views.
- The information which we will collect today will be attributable *(connected or associated)* to you <u>as a group</u>.

- We will not identify quotes or ideas *any one person* of this group. Because of the nature of small communities or groups, it is possible that people could link participants in this room to quotes in the report. This is why we need to talk about confidentiality.
- We *are* assuming that when we learn about one another's views, they remain confidential. In a small community (group) like this, people are identifiable to some degree by their views and opinions.
- Having said this, and having made these requests, you know that we cannot guarantee that the request will be honoured by everyone in the room.
- So we are asking you to make only those comments that you would be comfortable making in a public setting; and to hold back making comments that you would not say publicly.
- Anything heard in the room should stay in the room.
- All voices are to be heard, so I will step in if too many people are speaking at once or to make sure that everyone has a chance to speak.
- I may also step in if I feel the conversation is straying off topic.
- You can expect this discussion group to last about 1.5 hours, including a short survey.

Use of Tape Recorder *[If applicable]*

- As you will recall, this focus/discussion group will be recorded to increase accuracy and to reduce the chance of misinterpreting what anyone says.
- All tapes and transcripts will be kept under lock and key by the researcher.
- Names will be removed from transcripts. Participants will have coded numbers attached to their name, which only I will know.
- Only I and, my thesis supervisor will have access to transcripts (with personal names removed) of this focus group.
- For transcription purposes, I might remind you to say your first name for the first few times you speak so that when I'm transcribing the tape I can get used to recognizing your voice. That will ensure we assign the correct code to each person's answers. I will give you a gentle reminder.
- I'll also ask that when using abbreviations or acronyms, you say the full name at least once to aid transcription.

[AT THIS POINT, GROUP MEMBERS CAN QUICKLY INTRODUCE THEMSELVES –remind them that it is 'first names only'.][HAND OUT ANY MATERIALS (IF APPLICABLE) THAT THE PARTICIPANTS WILL NEED

*DURING THE FOCUS GROUP INCLUDING PENS OR SCRAP PAPER.
GIVE THEM A FEW MINUTES TO READ OVER ANY WRITTEN
MATERIAL NOTING THAT THEY CAN MAKE NOTES IN THE MARGINS
BEFORE THE DISCUSSION BEGINS.]*

II. INTERVIEW

- Focus group discussion begins with the facilitator asking the first question.
- *Open up discussion for general responses of participants to each question.*

Interview questions:

1. **What do you think about the air where you live? Does it concern/worry you?**
   1.1. **What are you most concerned/worried about**? **(ex. health, environment, aesthetics, etc.)**
2. **Poor air quality can come from different places such as cars, industry or dust drag out. What sources of air pollution are you most concerned about?**
3. **Does air quality affect your daily life? Explain.**
   3.1. **How does this make you feel**?
4. **Do you feel that you are able to change the air quality in your neighbourhood?**
   4.1. **Why or why not?**
5. **Have you taken action to deal with air pollution? Explain. (ex. reporting emissions, staying indoors, acceptance, etc.)**
   5.1. **Where do you get information about air quality? (ex. AQHI)**
6. **How do you feel about where you live? (ex. proud, connected, feel like part of the community)**
   6.1. **Why or why not?**
7. **Do you think your feelings about where you live affect your view of air quality?**
8. **Is there anything I forgot or something important that I should know about air quality where you live or the neighbourhood?**

Wrap-up:

- Remind participants that "what is said in the room should stay in the room".
- Thank the participants.

Appendix 7

Establishing Rigour in Qualitative Research[3]

Criteria	Definition	Strategy to establish rigour	Example
Credibility	Authentic representations of experience	Purposeful sampling	• Participants were sampled based on specific characteristics • i.e. whether or not they were born in Canada; gender; neighbourhood of residence
		Saturation	• Two focus group sessions were conducted • Near the end of both sessions the participants began to repeat earlier ideas/themes
		Method triangulation	• Qualitative results were triangulated with the quantitative results in paper one • This provided a more holistic view of individual experiences
		Debriefing	• Findings and interpretations were reviewed by the academic supervisor
		Member	• Participants were

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[3] Adapted from Baxter, J., & Eyles, J. (1997). Evaluating qualitative research in social geography: Establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers, 22*(4), 505-525.

		checking		given the opportunity to review and approve the focus group transcripts
			•	A community report and workshop/event will also be provided to the research participants
Transferability	Fit within contexts outside the study situation	Thick description	•	Detailed information was provided regarding chosen methodological and interpretive strategies (Section 3.4), so that a similar study could be conducted in another context
			•	i.e. sample characteristics; SoP survey; major themes; discussion of environmental stress & coping theory
Dependability	Minimization of idiosyncrasies in interpretation; Variability tracked to identifiable sources	Debriefing	•	See above
		Member checking	•	See above
Confirmability	Extent to which biases, motivations, interests or perspectives of the inquirer influence interpretations	Research journal	•	A journal was kept to document each stage of the research process, providing an audit trail
		Research diary	•	A separate diary was kept to allow for reflexive thinking during the data collection phase
			•	i.e. power relations; reflecting on individual biases

Appendix 8

Qualitative Codes/Themes

Awareness of Air Quality
- Sensory cues
- Impact of weather
- Comparative air quality

Knowledge of Air Quality
- Suspected causes/sources
- Observed/perceived effects
- Geographic variability
- Information sources

Concerns/ Risk Perception
- Health
- Aesthetics/cleanliness
- Emotional impacts
- Other environmental concerns

Perceived Control
- Proposed solutions
- Economic vs Environment
- Steel town legacy
- Residential mobility

Neighbourhood Perceptions
- Neighbourhood pride
- Sense of place & air quality perceptions
- Perceptions of safety
- Community connectedness
- Conviennece

Coping Mechanisms
- Problem-focused
- Emotion-focused
- isolating actions

Appendix 9

Knowledge Transfer

Conference/Event	Location	Date	Topic	Audience
SGES Research Day	Hamilton, ON	April 2013	Research Proposal (Poster Presentation)	Academic/ Community
International Medical Geography Symposium	East Lansing, MI	July 2013	Paper 1 (Oral Presentation)	Academic
SGES Research Day	Hamilton, ON	April 2014	Paper 2 (Poster Presentation)	Academic/ Community
Canadian Association of Geographers Annual Meeting	St. Catharines, ON	May 2014	Thesis presentation, both papers (Oral Presentation)	Academic
Environmental Studies Association of Canada Annual Meeting	St. Catharines, ON	May 2014	Paper 2 (Poster Presentation)	Academic
Community Presentations (McQuesten & Keith communities)	Hamilton, ON	April/ May 2014	Research summary for participants (Oral Presentation)	Community

Appendix 10

Community Report

Views of Women Living in Hamilton's Northeast Neighbourhoods

What is sense of place?

Sense of place talks about the way people feel about where they live. This includes attitudes and feelings that come to mind when you think about your neighbourhood.

A person's *sense of place* can be high or low. A high *sense of place* might be related to good memories of a place or having friends in your neighbourhood.

My Research Project

My project looked at the *sense of place* of women living in Hamilton. I compared views of *sense of place* and air quality between two groups: (a) Canadian-born women; and, (b) Immigrant women.

My project had three goals:
1. To compare *sense of place* between Canadian-born and Immigrant women in Hamilton
2. To compare opinions of air quality between Canadian-born and Immigrant women living in Hamilton's Northeast neighbourhoods
3. To see if *sense of place* is related to views of air quality

Part One: Telephone Survey

I used answers from a telephone survey to find out what types of things impact a person's *sense of place*. There were three things that influenced *sense of place*: income, age, and how long someone lived in the neighbourhood.

Income: People with higher incomes often have a higher *sense of place*.

Age: Older people often have a higher *sense of place*.

<u>Time in Neighbourhood</u>: People who have lived in their neighbourhood for a long time often have a higher *sense of place*.

Immigrants had a lower *sense of place* than Canadian-born residents. This may be because immigrants are often younger, have lower incomes, and have lived in the neighbourhood for less time.

Part Two: Focus Group Discussions

I held two focus groups (group interviews). One focus group was with Canadian-born women and the other was with immigrant women. Both groups had 8 members. Women were asked questions about air quality in the neighbourhood. The women talked about the following ideas:

<u>Awareness</u>: "Awareness" is what you think about air quality. Both groups of women were aware of air quality problems in Hamilton. Immigrant women compared the air quality in Hamilton to the air quality of their home country. Some immigrant women felt that the air quality back home was worse than in Hamilton.

<u>Knowledge</u>: "Knowledge" is about the sources of air pollution. Canadian-born women said that industry was the source of air pollution. Immigrant women talked about other causes of air pollution.

<u>Concern</u>: "Concern" is about air quality and your health. Both groups were worried about the health of themselves and their children. However, the groups were worried about different sources of pollution.

<u>Control</u>: "Control" is about changing the air quality in your neighbourhood. Both groups had problems with control over air quality. Canadian-born women talked about the importance of industry to the city's economy. They do not want the factories to be closed.

<u>Neighbourhood</u>: In general, both groups had good feelings about their neighbourhood. However, there were problems making connections with other people in their neighbourhood.

Conclusion

People with a higher *sense of place* are often more aware, knowledgeable, and concerned about larger air quality issues in their neighbourhood. Immigrants' *sense of place* often increases as they spend more time in Canada. Immigrants

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may become more aware, knowledgeable, and concerned about air quality issues as their *sense of place* increases.

One of the Canadian-born women said that there may be "power in numbers" when trying to improve air quality. Canadian-born residents and immigrants can work together to fix these types of neighbourhood problems. By working together, immigrants may improve their *sense of place.* They may also gain a better understanding of environmental issues. Due to their experience in their home countries, immigrants can give Canadian-born individuals a unique viewpoint on air quality issues.

Researcher and author of this report: Melissa Gallina (gallinma@mcmaster.ca)
Supervisor: Dr. Allison Williams
McMaster University, School of Geography and Earth Sciences

For more information on Hamilton's air quality and health impacts, please visit:
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