Chapter 1: Introduction

1.1 Introduction

The natural environment is intrinsically linked to human health. That the environment is important for maintaining and improving human health is not a new idea; however, the importance of this linkage is becoming increasingly apparent. Whereas concerns for environmental health have always existed, these concerns have become increasingly prominent in recent decades, while concerns for human health have likewise increased in scope. Indeed, our health is intrinsically linked to that of the environment, such that connections between the environment and health exist with reference to space, place and time, and across geographic scales.

Recently, the field of environmental health has become a growing field of academic interest, spanning disciplines to produce a wide body of literature.[1] Environmental health involves "the promotion of health in environments or geographically defined populations" (Eyles, 1997, p.2), and with this geographic focus, research has moved from large-scale,[2] global or national level connections between the environment and health to smaller scales, such as local level environments. With this expansion, there is growing recognition that place is important for health. Indeed, while research has shown that "although 'who you are' explains a lot of geographical variation in health outcomes, there is also an effect of 'where you are'" (Macintyre and Ellaway, 2003, p.26). In particular, with regard to the importance of place for health, the area of neighbourhoods and health has expanded to become its own field of study, connecting disciplines as diverse as health and medical geography, urban health, social epidemiology, environmental psychology and medicine, to produce a considerably sized and growing body of literature. No longer can connections between the environment and health be studied under a single disciplinary lense—they must be conceptualized and studied in an inter- and cross-disciplinary way, and at a variety of geographic scales.

[1] This literature is introduced here, and will be explored in greater detail in chapter 2.
[2] Where scale refers to landscape dimensions.

In recent years, the body of literature that focuses on the connections between the local level environment and health has grown steadily, in both depth and breadth.[3] At the local level, neighbourhood environments have been the subject of much investigation, by academic, government and non-profit researchers. Neighbourhood environments are salient for health, as they comprise (often measurable) features of the natural/biophysical, socioeconomic, and policy environments, which influence people on a day-to-day basis. Indeed, "neighbourhoods often serve as the base for social and political action with respect to issues that affect the health, well-being, quality of life and environment of communities" (Hancock et al., 1999, p.22). Features of neighbourhood environments are generally divided into contextual (neighbourhood level) and compositional (individual level) characteristics, which are studied for their role in shaping health at the individual and neighbourhood levels. While much neighbourhood level research has focused on the socioeconomic environment and social determinants of health, characteristics of the natural environment are also important for health at the neighbourhood level. Indeed, research on urban environments and health is now giving greater focus to the influence of the natural environment—nature, green spaces and urban parks—on urban health. Considering the growing rates of urbanization—both globally and in Canada—this is undoubtedly a topic of timely importance.

In addition, while characteristics of local level environments are important for health, individuals' perceptions of these environments have also been shown to be important in shaping health outcomes. The relevance of perceptions of the environment in influencing health, while not a new idea, forms a relatively new body within the existing environment and health literature, uniting disciplines such as environmental psychology, social epidemiology, health geography, and to a lesser extent, landscape architecture and urban planning. Indeed, perceptions of the environment and health are particularly relevant for exploring how people negotiate place effects on health at the local level. However, there has been little research to explore individuals' perceptions of links between the environment and health, across geographic scales. This represents a gap in the literature, which may be relevant for fields such as environmental psychology, health geography and urban planning.

This research responds to this gap by exploring perceptions of the environment and health at various scales, with a focus on local level connections between the environment

[3] Canadian researchers' contributions to this literature are notable, and have expanded in recent years.

and health. Specifically, this research explores links among participants' perceptions of the natural environment, the Mimico Creek, and individual and neighbourhood health in Malton (Mississauga), Ontario. This research draws upon survey results and key themes from focus group sessions with members of the Malton community to explore connections between the Mimico Creek environment and health in Malton. As such, this research contributes to the academic literature on perceptions of the natural environment and health at the local level. As this type of research forms a relatively underrepresented part of the academic literature on environments and health, it is hoped that this research will provide a useful contribution to the academic literature, and also be of use within the local level policy environment.

1.2 Research Objectives and Questions

This research explores connections between perceptions of the natural environment and health at various scales. This research is informed by the broad question: How are participants' perceptions of the natural environment and health linked to scale? Specifically, this research explores participants' perceptions of the environment and health in Malton, drawing upon focus group sessions conducted with participants from various social and community groups in Malton. To answer the above research question, this research has the following objectives:

- To explore the extent to which participants feel generally 'connected' to the natural environment; and,
- To explore participants' perceptions of the relationships between the Mimico Creek natural environment and health in their neighbourhoods.

Participants' 'connectedness' to the natural environment is explored through use of the survey. Exploration of participants' general connection to the natural environment allows for participants' perceptions of relationships between the environment and health to be explored vis-à-vis this 'connectedness.' Participants' perceptions of the relationships between the Mimico Creek natural environment and health are explored by drawing upon key themes raised by participants during focus group sessions.

This research is a project conducted in collaboration with a community partner, the Malton Environmental Stewardship Project (MESP). The Malton Environmental

Stewardship Project is closely involved in this research, through contact and collaboration with its Project Ecologist and Coordinator, Ms. Marnie Branfireun. MESP is interested in determining residents' perceptions of the natural environment and health in Malton, with a particular focus on the Mimico Creek watershed, and its green space areas and parks. Research collaboration with MESP is mutually beneficial, both for this research and for future research on the environment and health in Malton.

1.3 Outline of Thesis

This thesis is divided into five chapters. *Chapter 2: Background* provides an overview of the literature to locate this research in the relevant academic and policy literatures. In Chapter 2, the topic of local level environments and health is introduced, with a focus on the natural environment and health at the neighbourhood level. This chapter also discusses the importance of individual perceptions as they relate to health, in particular, perceptions of the natural environment vis-à-vis health at the local level. In Chapter 2, the geographical context of this research, set in Malton (Mississauga), Ontario, is examined, and the broad policy context of Healthy Cities and the Mississauga Model is introduced. This chapter also discusses the natural environment of the Mimico Creek watershed, which has been identified as a site of environmental concern, and introduces relevant city-level policy on urban watersheds and naturalization. Finally, the formation of the Malton Environmental Stewardship Project (MESP), the community partner for this research, is discussed. Chapter 2 also provides a consideration of the limitations of this research and a discussion of the author's positionality.

Chapter 3: Methodology and Methods introduces the methodological framework in which this research is situated, and discusses the specific methodological issues related to the use of focus groups and surveys. Chapter 3 provides an overview of the methods used in this research. Chapter 3 introduces the Malton Environmental Stewardship Project as a 'gatekeeper' to the Malton community, and introduces additional community contacts. In Chapter 3, the University of Toronto Ethics Review process is introduced, and ethical issues necessary to conduct this research within the Malton community are presented. Finally, this

chapter provides an in-depth discussion of the use of surveys and focus groups as exploratory tools in this research.

Chapter 4: Results presents the findings of this exploratory research. Chapter 4 presents participants' perceptions of the environment and health at various geographic scales, with an emphasis on emergent themes from focus group sessions. This chapter explores participants' perceptions of the natural environment and health by scale: first at a broad, general level; next, at the neighbourhood level; and, finally, at the local level with specific reference to the Mimico Creek and health in Malton. Chapter 4 also outlines the results of surveys completed during focus group sessions.

Chapter 5: Discussion and Conclusion presents a discussion of the results of this research and locates these results in the relevant literature, to date. Chapter 5 contains a note on the contribution of this research to the academic literature and, finally, suggests possible directions for future research.

Chapter 2: Background

2.1 Introduction

This chapter provides the background and literature review to contextualize this research and locate it within the relevant academic and policy literatures. Section 2.2 presents a brief review and discussion of local level environments and health, with a focus on health at the neighbourhood level. In section 2.2, the importance of individual perceptions of the environment and health are also discussed. In addition, this section provides a background to the inclusion of natural environments, nature and green space within the local environments and health literature. Section 2.3 presents the context of this research, set in Malton (Mississauga), Ontario, and introduces the broad policy context of Healthy Cities and the Mississauga Model. This section also introduces the socioeconomic and sociocultural context of Malton, which is unique within the City of Mississauga. This section introduces the natural environmental context of this research, and discusses urbanization and naturalization efforts within Malton, relevant to the Mimico Creek watershed, which has been identified as an area of environmental concern within the City of Mississauga. Finally, this section discusses the formation of the Malton Environmental Stewardship Project (MESP), the community partner for this research. Section 2.4 provides a brief chapter summary.

2.2 Local Level Environments and Health

There is increasing recognition that the environment is important for health at a variety of geographic scales (see Elliott and Wartenberg, 2004; Curtis and Rees Jones, 1998). Fittingly, local level environments have received much attention in the health geography and social epidemiology literatures for their role in shaping health, both at the level of the individual and that of the community. In general, studies have focused on the presence of contextual characteristics[4] in exploring area effects on health (for a discussion, see Diez Roux, 2004; Diez Roux, 2000; Curtis and Rees Jones, 1998). Diez Roux (2004, p.104) notes that:

[4] Sometimes called ecological associations.

> A key notion that has received much attention in epidemiology over the past few years has been that not all disease determinants can be conceptualized as individual-level attributes, hence the need to consider features of the groups to which individuals belong when studying the causes of ill health.

This is because contextual factors do not always serve as proxies for individual characteristics; rather, they may represent salient group-level characteristics at various scales (Diez Roux, 2004). As Curtis and Rees Jones note,

> A fundamental question addressed by most of this extensive research concerns whether statistically significant variation operates independently at different hierarchical levels. If so, then contextual effects may be considered relevant to our understanding of the health differences measured….

As such, selection of scale is important in analyzing contextual characteristics and area effects on health (Ross et al., 2004; Diez Roux, 2001). With regard to data at the local scale, Curtis and Rees Jones (1998, p.660) point out that:

> It is often argued that ecological [contextual] associations are best explored using data for small areas, which is relatively homogenous in terms of both health and social structure, so associations between health and social conditions can be seen more clearly.

Indeed, studies investigating contextual effects at the local level have often uncovered the existence of 'place effects' on health.

With the growing focus on area effects in the literature, there is increasing acceptance that place is important for health. Indeed, as Kearns and Moon (2002, p.609) observe, "visions for new geographies of health are centrally about the emerging importance of place in the study of health. Place has been seen as an operational 'living' construct which 'matters' as opposed to being a passive 'container' in which things are simply recorded." Fittingly, a 'place effects' literature has arisen to examine the effects of place on health.[5] The 'place effects' literature explores the collective influence of place on health, with attention to particular compositional and contextual characteristics. Macintyre et al. (2002) argue that:

> 'place effects' often appear to have the status of a residual category, an unspecified black box of somewhat mystical influences on health which remain after investigators have controlled for a range of individual and place characteristics.

[5] See Macintyre et al. (2002) for an introduction to the 'place effects' literature and a comprehensive discussion of place effects on health. See Tunstall et al. (2004) for a general discussion of places and health.

Indeed, the issue of place is linked to the local scale, as individuals spend much time in—and are therefore influenced by—local level environments. In particular, neighbourhood level[6] environments have received much attention in the growing literature on local level[7] environments and health.

However, while the local scale has received much attention in the literature, it can be argued that investigation over larger scales is also necessary. This may be especially true for factors related to the natural environment and health. For example, as Curtis and Rees Jones (1998, p.660) note:

> Some environmental factors, (such as climate, water and air quality, urbanisation and other organisation of labour markets), operate over wider areas, and their effects may not be identified at the small area level. Just as the individual's health may show variation associated with contextual effects, so small area effects may operate differently according to characteristics of the regions in which they are located.

Thus, it is salient to examine a variety of geographic scales in exploring relationships between the environment and health, even when relationships appear to operate primarily at the local scale. This is due to the fact that contextual effects may operate at more than one geographic scale, to influence health outcomes[8] (Diez Roux, 2004; Elliott and Wartenberg, 2004; Kaplan, 2004; Curtis and Rees Jones, 1998; Rosenberg, 1998). Furthermore, investigation across scales may also be salient in exploring perceptions of the environment and health. In particular, research has shown that individuals' perceptions of neighbourhood environments serve to shape health.[9] While local level research has had a tendency to focus on one component of the environment and to leave others absent (Sooman and Macintyre,

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[6] For the purposes of this research, scale is examined with respect to the broad (general) scale, the neighbourhood scale, and the local scale. While the local scale can be seen to include neighbourhood environments, it can also refer to specific environments or places. Thus, the local and neighbourhood scales are inter-related, both conceptually and practically. In addition, with respect to operationalization, social variables (e.g., neighbourhood income) can often be conceptualized differently than biophysical variables (e.g., watersheds), for the sake of analysis by scale.

[7] It is useful here to note differences between the local and neighbourhood levels. While the local level is often considered as a sub-regional level, with the neighbourhood level nested within the larger local scale, local environments are sometimes considered with reference to place. Thus, studies on local level environments and health and studies on neighbourhood environments and health often overlap. In this research, I have chosen to consider the local level as nested within the neighbourhood level environment. In this way, the Mimico Creek level environment is considered as the local level, within the neighbourhood level environment of Malton. This rationale is place-based, in the sense that the Mimico Creek is considered as specific places within the neighbourhood environment of Malton; although, the Mimico Creek watershed itself exists at a regional biophysical scale, encompassing areas larger than Malton.

[8] In addition, self-rated health may be subject to contextual effects, and thus may vary with conceptualization of factors by scale (Curtis and Rees Jones, 1998).

[9] While perceptions of a variety of neighbourhood characteristics have been shown to influence health, I will focus here primarily on perceptions of the natural environment and health, as this literature helps to inform this research.

1995), many studies now examine multiple environmental characteristics when considering connections between the environment and health.[10] Similarly, since many components of the natural environment cannot be conceptualized exclusively at the local level, it is beneficial to examine the relevance of scale for environment and health research. In particular, much research now focuses on the neighbourhood environments and health.

2.2.1 Neighbourhoods and Health: A Growing Field of Literature

Research has shown that the local level—and the neighbourhood scale, in particular—is salient in the study of environments and health.[11] As such, researchers have paid increasing attention to characteristics of local environments, and their relationship to health at the individual and neighbourhood levels. Many studies have emerged internationally, in particular, from the United Kingdom (see, for example, Cummins et al., 2005; Stafford et al., 2005; Walters et al., 2004), Europe (see, for example, Lindstrom et al., 2004; Drukker et al, 2003; Drukker and van Os 2003) the United States (see, for example, Altschuler et al., 2004; Diez Roux et al., 2004; Browning and Cagney, 2003; Cohen et al., 2003a and 2003b), and Australia and New Zealand (see, for example, Kavanagh et al., 2006; Kavanagh et al., 2005; Giles-Corti and Donovan, 2002), which link neighbourhood environments to self-rated health, as well as health outcomes, behaviours and opportunities. Expanding attention to relationships between neighbourhood environments and health is also reflected in a growing field of research on neighbourhoods and health in Canada (see, for example, Coen and Ross, 2006; Ross et al., 2004; Wilson et al., 2004; Kozyrskyj and Prasad, 2004; Raphael et al., 2001; Wakefield et al., 2001).

Research on neighbourhoods and health has examined socioeconomic characteristics (for example, neighbourhood level income, education), structural (for example, housing), and biophysical characteristics (for example, natural environmental characteristics, such as parks and green space) of environments in relation to health, and has demonstrated that a number of neighbourhood level characteristics are relevant for health. In general, studies focusing on the socioeconomic environment use socioeconomic status (SES) as an area measure to compare variables across areas that may be relevant for health. Neighbourhood socioeconomic status, social structures, and quality of the social environment have

[10] This is often accomplished through the use of multilevel models: see Subramanian (2004).
[11] For a discussion of the concept of neighbourhood in the neighbourhoods and health literature, see Bond Huie (2001).

repeatedly been shown to relate to health outcomes.[12] In particular, when examining the social environment and health, numerous international studies have shown that areas of lower socioeconomic status (SES),[13] or those considered to be disadvantaged,[14] may have diminished access to health-promoting features at the neighbourhood level, such that individual level differences cannot alone account for differences in health (see, for example, Coen and Ross, 2006; Cummins et al., 2005; Kavanagh et al., 2005; Browning and Cagney, 2003; Cohen et al., 2003a; Drukker et al., 2003; Giles-Corti and Donovan, 2002; Lantz et al., 2001; Diez Roux et al., 1997). In addition, research has shown that the effects of area characteristics on health outcomes may differ by gender (Kavanagh et al., 2006). Research has also shown that biophysical characteristics—such as characteristics of the natural environment— serve to shape health at the neighbourhood level. While the majority of the neighbourhoods and health literature focuses on socioeconomic characteristics and the social determinants of health, neighbourhood biophysical characteristics have also been shown to play an important role in shaping health outcomes (see, for example, Coen and Ross, 2006; Basu et al., 2004; Oyana and Lwebuga-Mukasa, 2004; Sexton et al., 2004; Wendel-Vos et al., 2004; Cohen et al., 2003b; Litt and Burke, 2002; Litt et al., 2002). In general, studies focusing on the biophysical environment compare natural environmental variables across areas in order to explore differences in health. Studies examining the salience of the natural environment for urban health tend to focus on the health effects of pollution exposure, as well as the influence of green spaces on health at the neighbourhood level. This is discussed in the following section.

Yet, while research shows that neighbourhood environments are important for health, influences of specific neighbourhood characteristics are often difficult to determine; furthermore, certain characteristics may be more salient than others for shaping health at the neighbourhood level (see, for example, Cummins et al., 2005; Ross et al., 2004; Macintyre et al., 2002; Bond Huie, 2001; Diez Roux, 2001; Pickett and Pearl, 2001). This may contribute to the growing field of research devoted to studying perceptions of neighbourhood environments, as they relate to health. Indeed, while research has shown that (often

[12] For a review of this neighbourhood social environments and health, see Sampson et al. (2002); see Yen and Syme (1999) for a review of the literature on social environments (including neighbourhood environments) and health. For a review of neighbourhood socioeconomic environments and health, see Pickett and Pearl (2001).
[13] SES is often operationalized in terms of neighbourhood income.
[14] Area disadvantage, or deprivation, includes SES and other social factors. See Kawachi et al. (2002) for a discussion of health inequalities, with a focus on area level SES and area level deprivation and health.

measurable) characteristics of neighbourhood environments are relevant for shaping health, individuals' perceptions of neighbourhood environments have also been shown to influence health (see, for example, Bowling et al., 2006; Cummins et al., 2005; Farquhar et al., 2005; Boslaugh et al., 2004; Wilson et al., 2004; Cohen et al., 2003a; Crighton et al., 2003; Drukker et al, 2003; Howel et al., 2003; Ellaway et al., 2001; Wakefield et al., 2001; Elliott et al., 1999). In general, research into perceptions of neighbourhood environments and health has focused on perceptions of socioeconomic and biophysical characteristics of neighbourhoods, and their relationship to self-rated health and health behaviours. For example, research has demonstrated relationships between perceptions of neighbourhood environments and health, making use of social and socioeconomic characteristics[15] (see, for example, Ellaway et al., 2001; Sooman and Macintyre, 1995). Indeed, sociodemographic and socioeconomic factors may influence individuals' perceptions of neighbourhood environments, such that residents of socially contrasting neighbourhoods may view social and physical aspects of these environments differently (Sooman and Macintyre, 1995), or at, least, through differing lenses.

Research has also examined perceptions of the neighbourhood biophysical environment and health. Some studies have shown that individuals' perceptions of the biophysical and natural environments serve to influence health (see, for example, Burger, 2005; Altschuler et al., 2004; Brody et al., 2004; Cohen et al., 2003b; Crighton et al., 2003; Howel et al., 2003). However, these perceptions are themselves linked to sociodemographic and socioeconomic factors (Bowling et al., 2006; Altschuler et al., 2004; Brody et al., 2004; Wilson et al., 2004), as social factors can be relevant for the quality of neighbourhood biophysical environments. For example, residents of higher income neighbourhoods are less likely to view pollution as an issue which affects their own neighbourhoods—but rather, to focus on pollution as a regional concern—while these concerns are prevalent in lower income neighbourhoods (Altschuler et al., 2004). In addition, differences in neighbourhood socioeconomic status are also related to municipal services spending on physical upkeep and care, which can affect perceptions of the biophysical and natural environments in a neighbourhood (Altschuler et al., 2004). Thus, owing to the relevance of biophysical characteristics for neighbourhoods and health, it is salient to explore the effects in relation to

[15] For a review how the social environment is relevant to health outcomes, see Yen and Syme, 1999.

health at the neighbourhood level. In particular, growing rates of urbanization make attention to the natural environment and, in particular, green spaces in urban environments, interesting areas of exploration, which are also of timely importance.

2.2.2 Neighbourhood Natural Environments and Health: Green Spaces[16]

Natural environments are intrinsically linked to health (for a review, see Frumkin, 2001). In particular, natural environments have been consistently linked to health in urban[17] environments (Maas et al., 2006; Regan and Horn, 2005; Chiesura, 2004; Grahn and Stigsdotter, 2003).[18] For example, some studies have examined the health benefits of neighbourhood parks (see Coen and Ross, 2006). However, while natural environments have been studied in relation to health at the neighbourhood level, few studies have focused *specifically* on the influences of the natural environment on health at the local or neighbourhood levels.[19] As such, more research is required to explore the natural environment and its salience for health at the local and neighbourhood levels, as these are arguably the levels at which individuals most often negotiate place effects on health. This gap in the literature may be due, in part, to the expansive nature of the natural environment, and difficulties in conceptualizing its role in shaping health outcomes, behaviours, and opportunities.

However, while the natural environment is indeed encompassing, some studies have focused specifically on the presence of green spaces at the local level (see, for example, Coen and Ross, 2006; Maas et al., 2006; Regan and Horn, 2005; de Vries et al., 2003; Takano et al., 2002). Indeed, the presence of green space has been shown to influence health at the local level, such that access to plentiful green space is associated with higher self-rated health (Maas et al., 2006; de Vries et al., 2003). Furthermore, research has shown that amount of green space is more strongly related to perceived health than is degree of urbanity

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[16] It should be noted that 'green' spaces are closely related to 'natural' spaces in the literature. However, 'natural' spaces often refer to the natural environment, or relatively unchanged (non-urban) environments, whereas, 'green' spaces often refer to urban parks or gardens, which stand out from the urban landscape as closer to the natural environment or, at least, 'green.' It should be noted that some studies refer to green spaces within urban environments as 'natural' spaces. In this paper, I have used the term 'green' spaces to refer to the natural environment in urban areas.

[17] While natural environments are also linked to health in non-urban environments, links between the natural environment and health in urban environments form the focus of this paper, since this research focuses on characteristics of the natural environment and health at the neighbourhood level in an urban/sub-urban environment.

[18] See Frumkin (2001) for a discussion of ways in which nature and natural environments are thought to influence health.

[19] While research in the landscape architecture and urban planning literatures often focuses on urban green space and urban ecology, the primary consideration of these literatures is not that of health.

(Maas et al., 2006; de Vries et al., 2003), which suggests that natural spaces may have a buffering effect on health. Experiences of urban nature provide individuals with positive emotional experiences and, thus, urban parks are perceived to be important for individuals' well-being (Chiesura, 2004). Furthermore, green spaces have been shown to be particularly beneficial for individuals subjected to emotional stress (Grahn and Stigsdotter, 2003; Hartig et al., 2003; Laumann et al., 2001), and that individuals experiencing stress are more likely to seek out green spaces (Regan and Horn, 2005). Studies have also examined green spaces and health in the context of general green space (Maas et al., 2006), park environments (Coen and Ross, 2006) and opportunities for physical activity or recreation (Bjerke et al., 2006; Kavanagh et al., 2005; Giles-Corti and Donovan, 2002; Takano et al., 2002) at the local or neighbourhood level. This reflects a range of health benefits of green spaces for those residing in urban and suburban environments, many of whom may have less access to these spaces than non-urban residents. Indeed, park environments are often urban residents' main source of natural or green space. These urban park environments play an important role for urban health, especially for that of children and for those living in areas of lower socioeconomic status (Coen and Ross, 2006; Veitch et al., 2006). However, as Coen and Ross (2006, p.362) observe, "[n]eighborhood parks are unique health-relevant resources, which have yet to be systematically studied within the spatial contextual framework for health." As such, it is clear that more research is needed (Sanesi et al., 2006) to uncover the role that green spaces, such as park environments, play in shaping health at the local and neighbourhood levels. Furthermore, while research demonstrates that green spaces are important for health in urban environments, little research has differentiated between types of natural environments or green spaces at the local level. For example, while many urban areas exist in close proximity to water bodies, little research has examined the importance of watersheds and, in particular, creek environments, for health at the local level. Thus, since these areas often form a significant part of natural environments in urban areas, it makes sense to explore their salience for health at the local level. This is discussed further in the following section.

While the natural environment is undoubtedly relevant for urban health, research into the relationship between natural environments and health has found that sociodemographic or socioeconomic characteristics are also relevant for health. For example, in general,

residents of socially advantaged neighbourhoods may have more favorable impressions of their neighbourhood environments than those of lower socioeconomic status (see, for example, Sooman and Macintyre, 1995.) In this case, negative factors such as litter, and physical damage are often especially apparent in relatively disadvantaged neighbourhoods (Sooman and Macintyre, 1995), which may lead residents of these neighbourhoods to feel less control over their neighbourhood environments. In addition, neighbourhoods of relatively high socioeconomic status generally have larger green space areas than neighbourhoods of lower socioeconomic status (Coen and Ross 2006; Maas et al., 2006; Pauleit et al., 2005). However, since access to—and quality of—the natural environment has both direct and indirect[20] health-promoting effects (Coen and Ross, 2006; Maas et al., 2006; Regan and Horn, 2005), these health benefits may serve to ameliorate some health-inhibiting effects of living in a neighbourhood of lower socioeconomic status.[21] In addition, the natural environment provides recreational opportunities and increases the likelihood that individuals will engage in health promoting activities, such as walking, which have also been shown to relate to socioeconomic characteristics of neighbourhoods (see, for example, Kavanagh et al., 2005; Giles-Corti and Donovan, 2002; Takano et al., 2002), as well as biophysical characteristics (Leslie et al., 2005). However, little research has been conducted to examine the natural environment and health at the neighbourhood level, apart from the connection between green spaces, park environments, and recreational activity. Thus, additional research is required to explore how the natural and social environments interact to shape health at the local and neighbourhood levels. Furthermore, it is clear that the beneficial effects of green spaces are partially dependent upon the quality of the natural environment itself. For example, individuals in areas with high pollution levels or sites of environmental concern may be especially sensitive to the perceived quality of the natural environment and its relationship to health (see, for example, Lima, 2004; Chattopadhyay et al., 1995). Indeed, as Rogan et al. (2005, p.157) argue, individuals are "intimately involved in an on-going relationship with the land, operating on personal, social and biophysical levels." As such,

[20] An example of a direct effect might be lowered stress levels due to time spent in a natural or green space; whereas, an example of an indirect effect may be that the addition of a green space to a neighbourhood of, say, lower socioeconomic status, may have beneficial effects which serve to lessen the collective impact of other health-inhibiting features. For example, the addition of high-quality green space, say, a park environment, to such a neighbourhood, may serve to increase individuals' physical activity levels, social interaction, or neighbourhood-level safety. In particular, these effects may have an even greater benefit to children residing in neighbourhoods of lower socioeconomic status.

[21] Interestingly, Kuo (2001) shows that exposure to green space increases coping abilities and resilience among residents of public housing in the U.S. This result may, in turn, affect other aspects of residents' health.

changes to the natural environment, for example, losses in environmental quality and environmental health, can be associated with changes in individuals' perceptions of, and relationships with, their surroundings (Rogan et al., 2005).[22] Indeed, this is consistent with the literature, which shows that individuals' perceptions of neighbourhood environments also serve to shape health.

Yet, while some research has examined the salience of individuals' perceptions of the natural environment on health at the local level, the influence of scale on environmental perceptions has rarely been explored. One exception is a study by Uzzell (2000) concerning the effects of scale on environmental perceptions. Uzzell (2000) showed that participants more easily conceptualized the natural environment at a global scale, and were more likely to perceive environmental problems to be serious with increased distance from participants. Scale was also related to participants' sense of control, in that, as scale increased, participants were less likely to feel a sense of responsibility for environmental problems. This was particularly enhanced at the global scale. Furthermore, Brody et al. (2005) showed that perceptions of the natural environment are often closely related to place, as well as social factors, such as involvement in environmental activities. Indeed, scale is often of prime importance to geographers in any field. As such, with the expanding attention to place effects in the health geography literature, the topic of environmental perceptions across scales is one of timely importance.

In summary, much research has explored local level environments and health, focusing on both socioeconomic and biophysical characteristics in exploring connections to health outcomes, behaviours and opportunities. These factors have been shown to be relevant for urban health and, with rising rates of urbanization, increasing attention has been paid to the role of natural environments in shaping health. However, while scale has been shown to be relevant for health,[23] as well as for perceptions of the environment and health, little research has examined perceptions of the natural environment on health with a focus on scale. It is within this context that this research is situated.

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[22] In a study by Rogan et al. (2005), individuals related losses in environmental quality and environmental health to their own health.

[23] For example, in the study of socioeconomic characteristics using multilevel analyses.

2.3 Research Context

This research explores participants' perceptions of the natural environment and health at various scales, with a focus on the local level.[24] Specifically, this research explores participants' perceptions of the Mimico Creek environment and health in Malton, drawing upon focus group sessions conducted with participants from various social and community groups in Malton. This section sets the context of this research, in Malton (Mississauga), Ontario.

2.3.1 Location: The City of Mississauga

One particularly interesting setting in which to conduct research on neighbourhoods and health is the City of Mississauga (part of the Region of Peel), which is one of Canada's fastest growing urban areas. The City of Mississauga was formed in 1974 from townships and villages in the Peel region. Geographically, the City of Mississauga is located at 43°36'N and 79°39' W, adjoining the west border of the City of Toronto. The City of Mississauga also borders the City of Brampton and the Town of Oakville. (See Figure 1: Map of Malton and Mississauga.) With regard to area, the City of Mississauga encompasses 288 km^2, or 28,750 ha (City of Mississauga, 2006a). With a population of over 700,000, the City of Mississauga is currently the sixth largest city in Canada, and the largest suburban municipality in North America (City of Mississauga, 2006a). The City of Mississauga prides itself on its accessibility for transportation and business, and is the only city in the Greater Toronto Area (GTA) that contains sections of seven major highways. In addition, Pearson International Airport, Canada's largest airport, is located in north Mississauga, adjacent to Toronto.[25] The City of Mississauga is also home to the Mississauga campus of the University of Toronto (UTM).

2.3.2 Policy Context: Healthy Cities and the Mississauga Model

The City of Mississauga is active in its efforts to provide a healthy living environment for its residents. The City of Mississauga is closely involved in the World

[24] In this research, the local level is considered with respect to place, and is conceptualized as nested within the neighbourhood level environment of Malton. As mentioned in section 2.2, in the literature, the local scale and neighbourhood scales often overlap, with the neighbourhood level generally considered to be nested within the local level.
[25] Specifically, Pearson International Airport borders Etobicoke, a former city suburb of Toronto, which is now part of the amalgamated City of Toronto.

Health Organization's (WHO) Cities and Health Research Programme through WHO's Healthy Cities Project (HCP), which recognizes the active role that cities play in influencing the health and lifestyles of residents. The Healthy Cities[26] movement originated in Canada and Europe in the 1980s; the Healthy Cities Project was created in 1986 to apply and implement the Ottawa Charter for Health Promotion in urban environments. The World Health Organization (see Hancock, 1993, p.7) defines a Healthy City as:

> one that is continually creating and improving those physical and social environments and strengthening those community resources which enable people to mutually support each other in performing all the functions of life and achieving their maximum potential.

Kenzer (1999, p.201) notes that, "at its core, the Healthy Cities movement is about the connection between urban living conditions and health." Takano and Nakamura (2001, p.263) explain that:

> Cities provide living conditions for their residents in complex ways. Health levels, which are largely dependent upon residents' living conditions and lifestyles, must be dealt with in terms of a complicated interaction of a variety of health determinants—physical, economic, and social—in residential environments.

Indeed, the Healthy Cities movement recognizes that "health is the result of much more than medical care; people are healthy when they live in nurturing environments and are involved in the life of their community, when they live in Healthy Cities" (The International Healthy Cities Foundation, 2002). Thus, in essence, Healthy Cities are "conscious of health" (Hancock, 1993, p.7), and strive for improvements in urban health (Werna et al., 1999).

In particular, the Healthy Cities movement recognizes the importance of local government for health promotion. As Hancock (1993, p.7) explains:

> the healthy city concept is firmly rooted in an understanding of the historical importance of local governments in establishing the conditions for health, and a firm belief that they can—and must—play a leading role in health promotion.

As such, Healthy Cities projects are not uniform across cities; rather, they are initiated independently, with support of government at the local level (Werna et al., 1999; Flynn, 1996; Waddell, 1994). Werna et al. (1999, p.35) note that Healthy Cities:

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[26] Sometimes referred to as 'Healthy Communities.'

> is a programme in *partnership* [original emphasis] with local stakeholders, with a major objective of promoting good health and preventing health related problems at the local level via a systemic change in urban policies.

Indeed, this local level emphasis enhances the effectiveness of local bodies in health promotion (Werna et al., 1999). Furthermore, the Healthy Cities movement is concerned with the involvement of individuals. Hancock (1997, p.8) notes that:

> health promotion and the creation of healthier cities and communities require the empowerment of individuals and communities to exert more control over all of the factors that contribute to their health and well-being. This means that people, as individuals and as members of community and neighborhood organizations, have to be centrally involved in the process of creating a healthier community.

Thus, the Healthy Cities movement, while grounded in principles for health at a global level, can be seen as a local level movement—involving local level government and organizations, as well as individuals—for the promotion of urban health.

Due to the importance of the Healthy Cities movement, the World Health Organization has researched the effectiveness of the Healthy Cities Program in promoting urban health. Speaking to the need for Healthy Cities, Kawaguchi (1999, p.1) notes that "[t]he Cities and Health Research Programme of the WHO Kobe Centre focuses on the development of evidence-based health systems for the improvement of the health status of city dwellers." Indeed, there is evidence for the success of Healthy Cities (De Leeuw and Skovgaard, 2005; Takano and Nakamura, 2001); however, much existing evidence is based in developed countries (Awofeso, 2003). In order to enhance the effectiveness of the CHP, WHO's Cities and Health Research Programme invited twelve cities internationally—including the City of Mississauga—to participate in this research programme.

The City of Mississauga has collaborated with the WHO Kobe Centre to develop a policy framework, the Mississauga Model, to bridge the gap between health research and policy-making at the city level (WHO, 2002). The Mississauga Model views health and the development of environmental policy holistically, and emphasizes the importance of city-university collaboration (WHO, 2002). The Mississauga Model calls for collaboration amongst municipal government, universities and non-governmental organizations, as well as community organizations and businesses, in order to identify urban health-related research questions (WHO, 2002). The Mississauga Model is an evolving framework (WHO, 2002).

Within the framework of the model, the City of Mississauga and UTM have recognized the interplay of environmental, community and economic outcomes in urban health research. This framework is an important context for this research, as this research focuses on the environment and health in Mississauga. In addition, this research involves collaboration with community partners, a goal of the framework. The City of Mississauga and UTM have used the framework of the model to identify four strategic themes for conducting research and developing policies that will contribute to health in the City of Mississauga, at both individual and community levels: Healthy People, Integrated Communities, Healthy Ecosystems, and Effective Social Systems.

This research contributes to the goal of the Healthy Cities framework and, specifically, contributes to the Healthy People and Integrated Communities themes. The Healthy Cities commitment to the interplay between the natural and social environments is reflected in this research. In addition, this research demonstrates the Healthy Cities focus on the local level for understanding urban health in the City of Mississauga. This research was conducted at the local level in the community of Malton (City of Mississauga), involving Malton community partners and organizations.

2.3.3 Socioeconomic and Sociocultural Context: Malton[27]

Malton is located in northeast Mississauga, adjacent to Pearson International Airport. See Figure 1 for a map that outlines Malton within Mississauga:

[27] For a brief history of Malton, see City of Mississauga (2006).

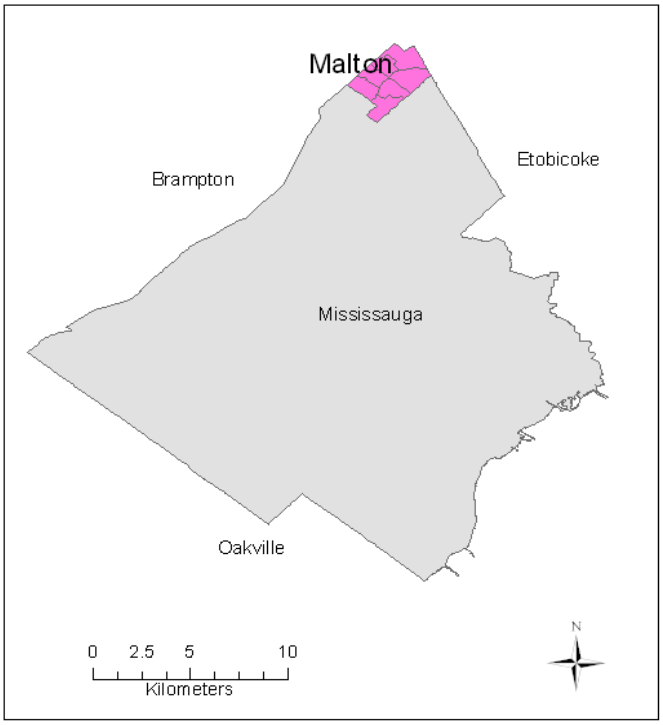

Figure 1: Map of Mississauga and Malton

From the map, it clear that Malton is located at the northern edge of the City of Mississauga. Malton is surrounded by the airport and industrial land, and a major highway (Highway 427), which separates it from the nearby community of Etobicoke (part of the City of Toronto).

Each year, Mississauga communities, such as Malton, accept many newcomers to Canada. Malton is a diverse community, and home to a growing number of new Canadians. In order to contextualize Malton as a local community, it is useful to compare Malton to Mississauga. See Table 2.1:

Table 2.1: Selected Statistics, Malton[28] and Mississauga[29]

	Malton only	**Mississauga, total**
Population (2001)	41,930 (6.9% of Mississauga)	610,730
Immigrant Population (2001)	24,650 (8.3% of Mississauga)	285,640
Visible Minority Population (2001)	29,050 (11.8% of Mississauga)	246,315
Percent Visible Minority (2001)	69.3%	40.3%
Speak English at home (2001)	23,265 (5.1% of Mississauga)	452,470
Average household income (2000)	$59,794	$80,442

Using data from the 2001 and 1996 Censuses of Canada, The Social Planning Council of Peel developed a 'portrait' of the Malton community, as part of its project, "Portraits of Peel." This portrait reflects Malton's well-known ethnocultural diversity, as well as its identity as a home to new Canadians.[30] In 2001,[31] immigrants accounted for 58.9% of Malton's population, up from 56.0% in 1996; additionally, over this period, Malton's immigrant population grew at a faster rate than the Canadian-born population. In 2001, immigrants to Malton comprised 8.3% of Mississauga's total immigrant population. In addition, in 2001, visible minorities accounted for 69% of the Malton population, up from 60.8% in 1996. Currently, the three fastest-growing visible minority groups in Malton are the Southeast Asian, Arab, and Japanese groups. However, in 2001, visible minorities accounted for 40.3% of Mississauga's population. Thus, Malton's visible minority population comprises a much larger percentage of its total population than does the visible minority population of Mississauga, as a whole. While Malton is a very diverse community, the single largest immigrant group to Malton is South Asian, where (East) Indians comprised 38.1% of all immigrants in 2001, and the top five countries of origin in 2001 were India, Jamaica, Italy, Guyana and Pakistan. Currently, the three fastest-growing immigrant groups in Malton originate from Pakistan, Sri Lanka, and Trinidad and Tobago. This differs somewhat from the countries of origin for the City of Mississauga, as a whole. In 2001, the

[28] All data for Malton from Mohanty and Alves (2004).
[29] All data for Mississauga, as a whole, from City of Mississauga (2004).
[30] However, health data are not included in the Portrait.
[31] Most recent data available for year 2001 in Mohanty and Alves (2004).

top five countries of origin for all of Mississauga were India, The Philippines, the United Kingdom, Pakistan, and Italy (with Jamaica a close sixth) (City of Mississauga, 2004).

Malton's diversity is also reflected in the number of languages and religious faiths within the community. In 2001, less than half of Malton residents, 45.4%, indicated English as their mother tongue, while the number of people speaking a primary language other than English rose by 13.7% from 1996-2001. Relatively fewer households in Malton speak English as a first language than do households in Mississauga, as a whole. In 2001, the five top non-official languages were Punjabi, Italian, Urdu, Gujarati and Tamil. The presence of the Indian community is illustrated in that four of the top five non-official languages are South Asian languages. In fact, 44.5% of Punjabi-speaking households resided in Malton, while Italian, Urdu, Gujarati and Tamil speaking households accounted for 22.5%, 9.3%, 16.1%, and 11.4%, respectively, of Mississauga households. In addition, in 2001, about half, 45.4%, of Malton residents identified themselves as belonging to a religion other than Christianity. Of these, Sikh, Hindu and Muslim groups form a large part of the Malton community. Although the largest single religious group in Malton is Roman Catholic, the percentage belonging to a religion other than Christianity is higher than for Mississauga, as a whole.

In terms of socioeconomic characteristics, Malton's labour force participation rate was 69.3% in 2001, up from 1996, while the unemployment rate was 6.5% in 2001, down from 10.7% in 1996. In 2000, the average household income in Malton was $59,794. While this number rose from the prior count in 1995, it is still much lower than the average household income for Mississauga, as a whole, at $80,442. However, in Malton, families earning less than $20,000 in 2000 had decreased by 19.8% from 1995. The number of families living on low incomes decreased by 8.6% between 1995 and 2000. In addition, in 2000, low-income persons accounted for 20.5% of the population, a decrease from 24.1% in 1995. These can be seen as indicators of socioeconomic improvement in Malton.

It should be noted that Malton is considered as a single neighbourhood and community for the purposes of research. The Malton area contains two Peel Region postal codes areas, L5T and L4T. In general, the size of these areas is large enough, such that it may be appropriate to consider them as separate neighbourhoods. While the Social Planning

Council of Peel (2004) considers the community of Malton to be one neighbourhood for the purposes of analysis, the Council recognizes that:

> neighbourhoods were identified based on postal code areas/forward sortation areas. These boundaries may not represent the 'natural' boundaries identified by residents, community groups and service providers. They were chosen based on a combination of 'natural' boundaries and practical limits on manipulating the available data.

Nonetheless, Malton, while extremely diverse, is considered to be a 'natural,' contiguous community for the purposes of research. However, it is likely that Malton's isolation from other communities within and surrounding the City of Mississauga serves to reinforce its identity as a separate community and neighbourhood, as perceived by residents of Malton and nearby communities. Indeed, while areas the size of Malton may normally be thought to contain a number of smaller neighbourhoods, Malton's geographical isolation from other communities by means of land use (land use by Pearson International Airport, adjacent industrial land and nearby highways) contributes to the appropriateness of its consideration as a single neighbourhood for the purposes of analysis.

2.3.4 Natural Environmental Context: Urbanization and Naturalization

The City of Mississauga is an urban environment, with mixed land uses. While the City of Mississauga prides itself on being 'green' (City of Mississauga, 2005) and is active in the protection of its many natural areas and parks,[32] the influences of factors such as urbanization and industrial activity can make this task difficult (City of Mississauga, 2002). As a result, the City of Mississauga has many areas of environmental concern (Toronto and Region Conservation (TRCA), 2005). Indeed, urbanization and related changes to the land often have deleterious effects on natural environments (Breuste, 2004). For example, changes in land use in urban areas have produced changes in habitat for plant and animal species (Bryant, 2006); however, the preservation of native vegetation and species within urban landscapes is a goal for environmental health (Bryant, 2006; Breuste, 2004). In general, the environmental health of urban or suburban areas is compromised by development of these areas and, in particular, of remaining natural spaces. Yet, while urban environments are characterized by mixed land uses and loss of habitat, maintenance of

[32] There are over 481 parks and woodland areas in the City of Mississauga.

native vegetation and natural spaces are essential for environmental preservation (Breuste, 2004). However, in urbanized environments, natural spaces are often restricted to small areas such as greenways and parks, which may become overused (Baschak and Brown, 1995). As such, in urbanized environments, particular natural environments, such as wetlands, are often left without sufficient ecological support for health (Baschak and Brown, 1995). Conservation bodies[33] for the City of Mississauga have likewise identified areas of concern within Mississauga's watersheds.[34]

Areas of environmental concern within Mississauga include sections of the Etobicoke and Mimico Creek watersheds in Malton, which pass through suburban-residential and industrial areas (TRCA, 2005). The Malton area, in particular, consists mostly of suburban-residential and industrial areas, with few remaining natural spaces restricted to areas along the Mimico Creek. (See Figure 2: Aerial Photograph of Mimico Creek in Malton.) The Etobicoke-Mimico Creek watershed is located in the Greater Toronto Area, at the west border of the City of Toronto. The Etobicoke Creek watershed comprises 211 km^2, and the smaller Mimico Creek watershed, adjoined to the Etobicoke Creek watershed, comprises 77 km^2. The Mimico Creek lies between the Etobicoke Creek watershed (to the west) and the Humber River watershed (to the east). The Mimico Creek flows from the south slope of the Oak Ridges moraine, from its headwaters in Brampton, through Malton (Mississauga) and Toronto before draining into Lake Ontario. The Mimico Creek watershed is highly urbanized and exhibits related impacts, such as poor water quality and aquatic and terrestrial habitat loss and degradation (TRCA, 2005; TRCA, 2002). However, urban development has lead to stream channelization (artificial stream restructuring), draining of wetlands, and loss of habitat (TRCA, 2005). Mimico Creek is now considered to be one of the most urbanized and degraded watersheds in Canada (TRCA, 2005). Toronto and Region Conservation (2005) notes that:

> What remains of the natural ecosystem in Malton is restricted to Wildwood Park and several small fragmented green spaces located along the creek systems in the Malton and Derry Greenways. These areas need help in order to become a healthier urban ecosystem for wildlife and humans alike.

[33] These include Toronto and Region Conservation (TRCA), Conservation Halton, and Credit Valley Conservation.
[34] The term, watershed, refers to the entire drainage basin of a river or stream network. Smaller tributary streams drain into larger streams or rivers, which themselves drain into larger bodies, such as lakes or oceans. Watersheds are delineated along topographical boundaries, which divide streams with differing drainage basins. In the City of Mississauga—as in most areas alongside lakes—watersheds drain to Lake Ontario.

In order to restore the environmental quality and health of its urban watersheds, the City of Mississauga has practiced naturalization efforts to restore the natural environment within urban areas.

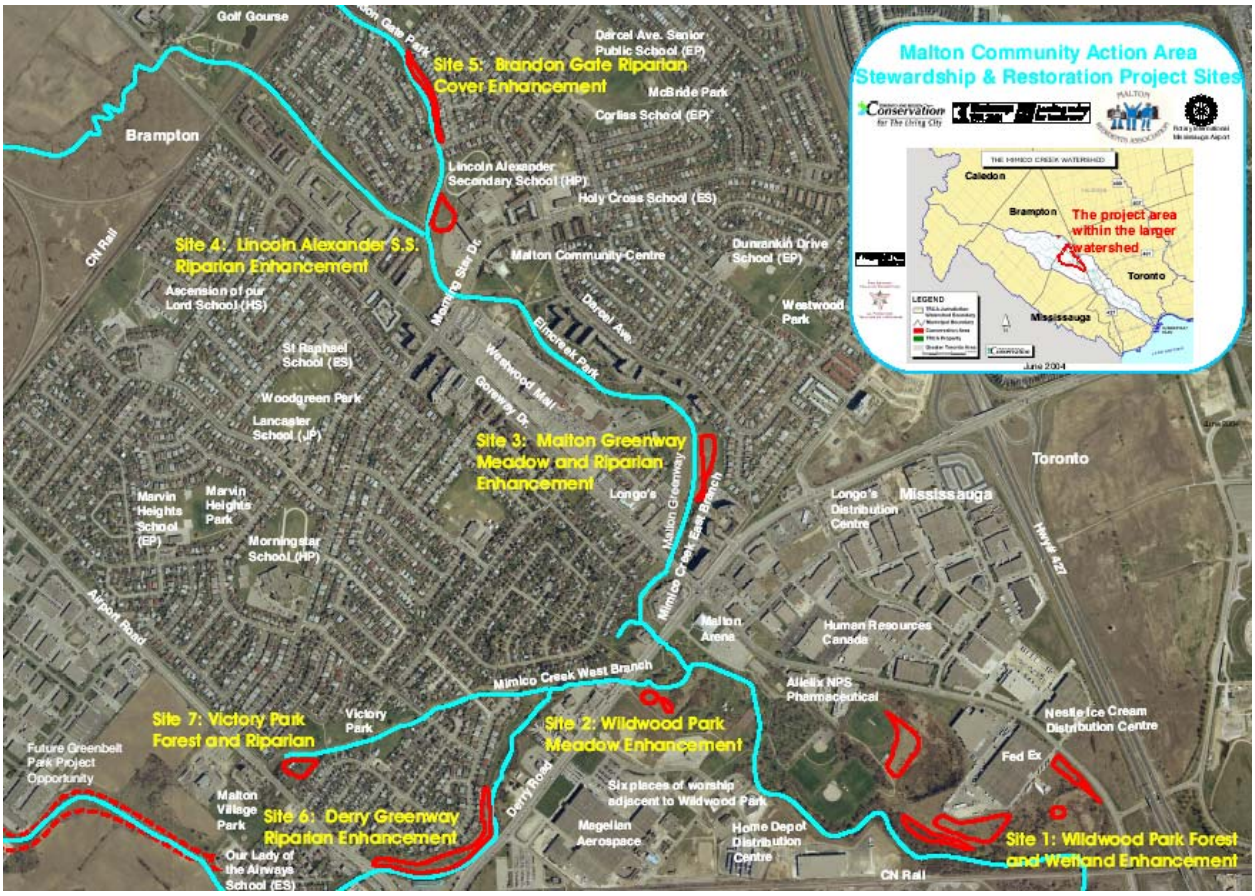

Figure 2: Aerial Photograph of Mimico Creek in Malton (Toronto and Region Conservation, 2004)

The City of Mississauga recognizes many impacts of urbanization on the natural environment in the city. The City of Mississauga (2002, p.7) notes that "[n]atural areas in Mississauga are quite often degraded when compared to the wilderness of remote areas," and that these areas therefore require help to maintain environmental health.[35] As such, the city has engaged in naturalization efforts throughout its ecosystems, with a focus on its watersheds, in order to improve environmental health. Naturalization "is a process in which

[35] A 1996 Natural Areas Survey of natural features in the City of Mississauga recommended strategies to preserve, restore and enhance natural areas within the city. Naturalization efforts are emphasized to restore the natural environment in Mississauga.

altered or degraded ecosystems are encouraged to regenerate into a more natural area consisting of native species" (City of Mississauga, 2002, p.8). Naturalization efforts have been successful at increasing the diversity of wildlife habitat, as well as biodiversity, within the city (Mississauga, 2002). Indeed, naturalized areas often provide habitat and corridors for rare or endangered species, which may not be able to survive in urban or suburban areas (City of Mississauga, 2002).

It should be noted that naturalization efforts are focused on areas in need, and do not detract from existing parkland areas. In fact, naturalization sites are specifically chosen for a variety of reasons. These include, among others: to improve water quality; to protect river valleys; to create or enhance wildlife corridors; to create or enhance native wildlife habitat within riparian[36] zones; to support areas whose ecosystems require special protection and preservation; and to increase public awareness and appreciation of the natural environment (City of Mississauga, 2002, p.8). Naturalized areas also provide opportunities for environmental education for children. Specific areas within Mississauga are often chosen to support existing natural areas, such as woodlands, wetlands, and alongside roadways adjacent to these areas to provide a natural buffer zone. Often, these buffer zones form greenway areas,[37] linear tracts of land which link natural areas within the urban landscape. Many greenway areas within Mississauga have been created to support existing natural areas, and to provide corridors for wildlife (City of Mississauga, 2002).

In Malton, areas such as Wildwood Park,[38] and Malton and Derry Greenways, have undergone naturalization efforts in order to improve environmental health. Wildwood Park is located in the centre of Malton, and is the largest natural space and park in Malton, with both naturalized and 'park-like' areas. Wildwood Park also contains picnic areas and sports fields. Malton Greenway is a greenbelt area that begins at the intersection of Goreway Drive and Derry Road, a major intersection in Malton, and stretches to behind Westwood Mall, Malton's only indoor shopping mall and largest shopping complex. Derry Greenway is a greenbelt area that begins behind the intersection of Derry and Airport Roads, a major

[36] Riparian zones consist of the area adjacent to rivers, streams, or other bodies of water. These areas are valuable as wildlife habitat, and for ecological integrity and environmental health.

[37] The City of Mississauga notes that most greenway areas are not developable lands, since most exist within floodplains of rivers or streams. However, not all floodplains are fully naturalized areas, as river and stream 'enhancement' often involves placing concrete reinforcement or rock-filled wire baskets around banks. The City of Mississauga recognizes that these measures do not consider the state of the natural environment, and are no longer preferable measures for preventing bank erosion (City of Mississauga, 2002).

[38] See aerial photo for locations of naturalization enhancements in Wildwood Park.

intersection in Malton. These greenspace areas are adjacent to suburban-residential and industrial areas in Malton, yet they provide valuable habitat for wildlife in the area. These naturalized areas are an example of the efforts to improve environmental health in Malton. However, the City of Mississauga also highlights the importance of individual level awareness and involvement for environmental stewardship. It notes that in order for "protection and preservation efforts to succeed, people's awareness, perceptions, attitudes and values must be addressed in the management and stewardship process" (City of Mississauga, 2002, p.10). Indeed, these closely relate to the goals of the Malton Environmental Stewardship Project (MESP), the community partner for this research.

In order to accomplish the goal of a healthier urban ecosystem in Malton, the Toronto and Region Conservation (TRCA) and the City of Mississauga joined with the Malton Residents Association and the Mississauga Airport Rotary Club to create the Malton Environmental Stewardship Project (MESP) in 2004.[39] These organizations are now executive partners with MESP. The Malton Environmental Stewardship Project is a non-profit project that seeks to create a "Cleaner and Greener Malton" through community partnerships, outreach programs and environmental stewardship and restoration activities, such as naturalization plantings and habitat enhancements within the Mimico Creek watershed (TRCA, 2005). The TRCA notes that "the Malton Environmental Stewardship Project (MESP) is dedicated to engaging Malton citizens, community groups, schools and businesses in the revitalization of Mimico Creek" (TRCA, 2005). To engage Malton residents, MESP runs several programs in the areas of habitat enhancement, community outreach, school/youth outreach and business programs (TRCA, 2005). The purpose and activities of the Malton Environmental Stewardship Project also supports the City of Mississauga's (2002, p.16) position that residents' participation in environmental efforts is essential for promoting environmental health, such that:

> Of prime importance is a shift in consciousness in which residents adopt a stewardship approach and participate in many of the environmental projects. These activities are excellent opportunities for people to engender a healthy relation with the environment that supports us all.

[39] MESP is funded by The Ontario Trillium Foundation and the Region of Peel. It received a $253,700 from The Ontario Trillium Foundation in its inaugural year. Currently, MESP's funding extends to 2008.

Indeed, MESP's continued involvement in the Malton community reflects this passion for environmental change.

The Malton Environmental Stewardship Project is closely involved in this research, as a community partner. MESP is interested in determining Malton residents' perceptions of the environment and health, as part of its mandate to create a 'cleaner and greener' Malton. MESP has provided this research with the relevant local policy background in order to examine the Mimico Creek and health in Malton. In addition, the involvement of MESP in this research has facilitated participation, and has served as a gateway to the Malton community.

2.4 Summary

In summary, this chapter has provided a background and literature review to contextualize this research, and to locate it within the relevant academic and policy literatures. This chapter has outlined literature related to local environments and health—with a focus on neighbourhoods and health, and natural environments and health—and has discussed the importance of individuals' perceptions in shaping health at the local level. However, while many studies have explored relationships between perceptions of socioeconomic characteristics of neighbourhoods and health outcomes, fewer studies have focused on perceptions of biophysical neighbourhood environments and health, and even fewer have focused primarily on the natural environment. Furthermore, the issue of environmental perceptions across geographic scales has yet to be adequately explored. Indeed, that few studies exist which explore relationships between perceptions of the natural environment and health at the neighbourhood level reflects a space in the literature in which studies such as this research are situated. This chapter has also outlined the context of this research, set in Malton (Mississauga), Ontario, and has introduced the socioeconomic and sociocultural context of Malton, which is unique within the City of Mississauga. This chapter has also described the environmental context of this research, with reference to the Mimico Creek watershed, which has been identified as an area of environmental concern within the City of Mississauga. While the influences of urbanization have compromised

environmental health in the Mimico Creek watershed, naturalization efforts have been initiated to ameliorate these effects and improve environmental health in Malton.

Chapter 3: Methodology and Methods

3.1 Introduction

This research explores connections between perceptions of the natural environment and health at various scales. This research is informed by the broad question: How are participants' perceptions of the natural environment and health linked to scale? Specifically, this research explores participants' perceptions of the environment and health in Malton, drawing upon focus group sessions conducted with participants from various social and community groups in Malton. This chapter outlines the methodological framework and methods used in this research. Section 3.2 provides discusses the qualitative methodological framework used to shape this research. This section also discusses the exploratory nature of this research. Section 3.3 discusses participation in this research. This section examines the ethics process required to conduct qualitative research in the Malton community, as well as issues related to recruitment and participation by members of the community, and the author's positionality. Section 3.4 introduces the survey and discusses issues related to developing the survey for use in the Malton community. This section also examines the use of surveys to explore participants' perceptions of the environment and health in Malton. This section introduces focus groups as a research method, and discusses issues related to conducting focus groups with the Malton Community. This section also discusses the use of focus groups to explore participants' perceptions of the environment and health. Section 3.6 discusses issues of positionality. Finally, section 3.7 provides a chapter summary.

3.2 Qualitative Methodological Framework

Local and neighbourhood environments and their relationship to health has been the subject of much quantitative investigation (see, for example, Coen and Ross, 2006; Cummins et al., 2005; Diez Roux et al., 2004; Ross et al., 2004; Browning and Cagney, 2003; Drukker and van Os, 2003; Drukker et al., 2003), including a growing number of studies employing multilevel[40] quantitative methods (see, for example, Kavanagh et al.,

[40] For a review of multilevel methods in analyses of neighbourhoods and health, see Pickett and Pearl (2001). For discussion of the relevance of multilevel statistical models in public health research, and for exploring neighbourhood effects on health, see Subramanian (2004), O'Campo (2003), and Diez Roux (2000).

2006; Kavanagh et al., 2005; Chaix et al., 2005; Subramanian et al., 2005; Boslaugh et al., 2004; Lindstrom et al., 2004; Roos et al., 2004; Sundquist et al., 2004; Drukker et al., 2003). However, while quantitative methods are undoubtedly essential for identifying general relationships and trends between environmental characteristics and health outcomes, individuals do not necessarily negotiate local or neighbourhood level spaces in uniform ways, nor in ways conceptualized by researchers. Indeed, while quantitative data provides us with unparalleled descriptions of local or neighbourhood level environments, qualitative data can add layers of exploratory—and explanatory—meaning to the relationships between environments and health. As such, the literature now reflects an increasing utilization of qualitative inquiry, employed both as sole methods of analysis (see, for example, Krenichyn, 2006; Wellstood et al., 2006; Macintyre et al., 2005; Farquhar, 2005) and in conjunction with quantitative methods (see, for example, Wilson et al., 2004; Ellaway et al., 2001; Wakefield et al., 2001; Elliot et al., 1999). Indeed, research no doubt benefits from this timely combination of methods and practices in the study of environments and health at the local and neighbourhood levels.

The value of qualitative methods for enhancing our understanding of environments and health is indeed considerable. In general, Patton (2002, p.227) notes that:

> Qualitative methods permit inquiry into selected issues in great depth with careful attention to detail, context, and nuance; that data collection need not be constrained by predetermined analytical categories contributes to the potential breadth of qualitative inquiry.

As such, in contrast to quantitative techniques, which ask standardized questions in order to obtain precise categories of responses, qualitative instruments allow for increased breadth and depth of information (Patton, 2002). Thus, qualitative inquiry allows for emergent themes from data, which may not have been conceptualized at the outset of a research.

However, in conjunction with their ability to enhance our depth of insight, qualitative methods effectively reduce the number of participants involved in a research, if these numbers are considered with quantitative studies as the standard. As such, qualitative studies generally involve fewer participants than quantitative studies, as qualitative research is focused upon understanding, rather than on obtaining quantifiable or representative results (Patton, 2002; Rice and Ezzy, 1999). In qualitative analysis—where the goal is not to create a representative sample of participants—it is often difficult to predict the appropriate sample

size, that is, the appropriate number of participants for each research (Rice and Ezzy, 1999). Indeed, as Rice and Ezzy (1999, p.46) point out, a qualitative "sample is large enough when it can support the desired analyses. As the focus of the analysis is qualitative, the criteria for the sample size are also qualitative." The key for involving a certain number of participants in a qualitative research is, then, not a question of representativeness within a larger population, but a question of being able to adequately explore meaning inherent in the issue of inquiry. As such, purposeful sampling is essential for qualitative research, even for studies with an exploratory emphasis.

This research utilizes a qualitative methodological framework, in the sense that it is concerned with exploring participants' perceptions of the natural environment and health, at various geographic scales. This research makes use of focus group discussions to explore participants' perceptions of the natural environment and health, with a focus on perceptions of the environment at the local and neighbourhood levels, as they relate to the Mimico Creek environment in Malton. This research also makes use of a quantitative survey within focus group sessions to further explore participants' connections to the natural environment, their perceptions of their neighbourhood environment and health in Malton, and to identify some sociodemographic characteristics of participants.

3.3 Participation in this Research

3.3.1 Community Partners and Gatekeepers[41]

This research is an exploratory project which benefits from close involvement by a community partner, the Malton Environmental Stewardship Project, which played a key role as a gatekeeper in allowing the author to gain access to various Malton community groups.[42] Gatekeepers are key contacts who provide access to key community members or groups. In particular, gaining access to community schools is known to be difficult, but was facilitated through MESP. The Malton Environmental Stewardship Project was also closely involved in the development of the survey and focus group questions employed in this research. While

[41] While the author attended various community meetings (for example, Malton Youth Services, Malton Neighbourhood Services, and the Malton Black Development Association) and community events (for example, the 2005 and 2006 Malton Stewardship Days, the 2005 Malton Festival, and the Health Fair (2005)), gatekeeper contacts were obtained primarily through MESP, the community partner and main gatekeeper for this research.

[42] In fact, MESP facilitated access to a number of groups which did not choose to participate in this research; however, simply to have access to many community contacts was a great benefit to this research.

members of the Malton community were not involved in co-designing this research, they provided helpful comments during the piloting phase of the survey, which were incorporated during survey revisions.[43] Furthermore, a survey was co-developed for use exclusively by the Malton Environmental Stewardship Project within Malton. Results from this survey do not appear in this thesis, as this stream of research is under the direction of MESP. Lastly, findings of this research[44] will be communicated to the Malton community and will be made available at the Malton Community Centre through a report for community use.

The Malton Environmental Stewardship Project serves as the principal gatekeeper to the Malton community for this research. MESP is located in the Malton Community Centre, a focal point for Malton community groups and the public. Due to its extensive community involvement, MESP has contacts among many community groups, such as social and cultural groups, faith groups, and educational institutions.

3.3.2 Recruitment & Sampling

As previously noted, sampling in qualitative research is not generally concerned with ensuring that a sample is fully representative of the population participating in the research (Rice and Ezzy, 1999). Indeed, qualitative studies often have much smaller samples than those obtained through quantitative research, such that what constitutes "'bias' in statistical sampling, and therefore a weakness, becomes intended focus in qualitative sampling, and therefore a strength" (Patton, 2002, p.230). Indeed, the strength and effectiveness of qualitative research depends upon this purposive sampling, and the inclusion of appropriate research participants.

This research employed gatekeepers and a 'snowball' sampling approach to recruit members of Malton community groups. Known for its social diversity, Malton is home to a diverse number of ethnic, cultural and social groups. Indeed, the Malton Community Centre speaks to this diversity, with services for virtually every community group within the larger Malton community. However, with this diversity, communication barriers were more prominent than one might expect from less diverse environments. As such, due to the socially diverse context of Malton, it was necessary to use gatekeepers to obtain access to

[43] Discussed in section 3.4.4.
[44] Preliminary findings were presented to Mississauga environment students at the 2005 EcoBuzz conference at Lincoln Alexander Secondary School.

groups within the community. Use of gatekeepers is important in order to gain access to the appropriate people, as the decision of whom to involve will influence the research (Valentine, 2005). As such, a snowball sampling approach was used to recruit participants by initially contacting gatekeepers, who provided access to larger groups of community members. With snowball sampling, an initial respondent, or group of respondents, is asked to suggest others who may be willing to participate in the research. The approach of this research was such that gatekeepers were used in order to gain initial access to community groups, whereas, snowball sampling was used to recruit participants within these groups. However, one potential drawback of the snowball sampling approach is that the characteristics of the initial respondent(s) will shape the structure of the sample (Rice and Ezzy, 1999). Nonetheless, this was determined by the author and MESP, the community partner, as the most appropriate way to gain access to groups within the Malton community. Gatekeepers were thus informed of the purpose of this research, and were given information letters[45] which outlined their potential involvement in this research. The sampling goal for this research was to include groups of participants until relatively little new information was gathered from each subsequent group, although a particular goal for the total number of focus groups was not set.

Throughout the course of this research, MESP also fostered new contacts with community groups on behalf of this research, for the purpose of inviting potential social groups to participate in focus group sessions. Specifically, MESP provided contacts for St. Mark's Presbyterian Church, Lincoln Alexander Secondary School, and other groups within the community. MESP also facilitated access to Malton Neighbourhood Services, also located within the Malton Community Centre, and Malton Youth Services. Access to Lincoln Alexander Secondary School, the only public-board secondary school in Malton, was achieved through MESP a teacher at the school who is involved with environmental initiatives at Lincoln Alexander, and leads the students on regular creek clean-ups. Focus group sessions were organized with three classes at the school: Grade 11 Family Studies, Grade 12 Psychology, and Grade 9 Geography. Access to Malton Neighbourhood Services was also facilitated through MESP. Malton Neighbourhood Services, located in the Malton Community Centre, offers settlement and community services to newcomers to Malton—

[45] See Appendix 1 for copies of the information letters used in this research.

many of whom are recent immigrants to Canada—and other members of the Malton community. Malton Neighbourhood Services coordinates a variety of programs for newcomers, including, among others, translation and interpretation, LINC (language instruction for newcomers to Canada) classes, computer classes, pre-natal education, and Ontario Early Years programs (Malton Neighbourhood Services, 2004). The LINC5 class agreed to participate in a focus group session. Access to the LINC 5 class at the Malton Community Centre was achieved through the LINC Manager at Malton Neighbourhood Services. MESP also aided in the communication of this research to Malton Neighbourhood Services and the LINC Manager.

Several community groups and school classes graciously agreed to participate in this research. Focus group sessions were conducted with the St. Mark's Presbyterian Church (2 focus group sessions), classes from Lincoln Alexander Secondary School (3 focus group sessions), the LINC5 class at Malton Neighbourhood Services (1 focus group session), and the Malton Black Development Association[46] (1 focus group session), to make seven focus groups, in total. When possible, focus groups were limited to ten participants or under, as recommended in the literature (see Fern, 2001; Cameron, 2000; Rice and Ezzy, 1999). However, focus group size varied considerably across groups, mostly due to the fact that two entire classes, the Grade 11 Family Studies class at Lincoln Alexander, and the LINC5 class at Malton Neighbourhood Services, were involved in focus group sessions. It was not possible to involve students from these classes in a separate environment, utilizing a smaller group, so focus groups were conducted with these classes individually. The following is a legend showing abbreviations for the seven focus groups:

LA9 Lincoln Alexander Secondary School – Gr. 9
LA11 Lincoln Alexander Secondary School – Gr. 11
LA12 Lincoln Alexander Secondary School – Gr. 12
LINC5 LINC class, level 5 – Malton Neighbourhood Services
MBD Malton Black Development Association
SM1 St. Mark's Presbyterian Church – first group
SM2 St. Mark's Presbyterian Church – second group

[46] This group was recruited through initial contact at a meeting of Malton Youth Services, to which the author was invited to attend and make a short presentation. An introductory presentation was subsequently given at a meeting of the Malton Black Development Association, where the group agreed to become involved in a focus group session.

Given the exploratory nature of this research, the appropriate number of focus groups was flexible. The author and MESP sought to maximize the number of focus groups conducted with Malton community groups, in order to acknowledge the diversity of the community. However, a smaller number of focus groups was conducted than was originally anticipated. Nonetheless, many responses obtained were consistent across groups; thus it might be expected that these responses would also be reflected across additional groups. In total, nine community groups[47] were contacted. One community group expressed interest, but was unable to participate, and one group agreed to participate, but later cancelled.

Seventy-one members of the Malton community participated in a total of seven focus group sessions. Focus groups were essentially balanced by gender, with male participants slightly outnumbering female participants, in total. However, nearly all[48] focus group sessions were fairly balanced between males and females. Many focus group participants were involved in community activities within Malton, and some were specifically involved in environmental and creek clean-up efforts. Many of the older participants were long-term residents of Malton; however, many participants were newcomers to Malton—and newcomers to Canada—which generally reflects the diversity of the Malton area. Participants were not provided with any compensation for their involvement in this research.

3.4 Data Collection

3.4.1 Use of Surveys and Focus Groups

Surveys are a popular research method (Singleton and Straits, 1999). They can be utilized under a variety of circumstances to gain quantitative statistics and qualitative insights (Valentine, 2005). However, the type of questioning on surveys will determine the type of data collected. In this way, surveys can only answer what they set out to answer, and are thus limited by the theoretical background and intent of the researchers (Patton, 2002). Surveys are usually standardized, to allow for replication of results (Valentine, 2005). As such, well-designed questions are essential to any successful survey, and it is often valuable to pre-test surveys for usability (Gray and Guppy, 2003). In particular, word selection is very important for designing survey questions. Leading questions should be avoided, as these

[47] This is counting Lincoln Alexander Secondary School and St. Mark's church once each.
[48] With the exception of the session conducted with the Malton Black Development Association.

may be too suggestive, reflecting researchers' views, rather than respondents' answers (Gray and Guppy, 2003).

While surveys are useful for gathering quantitative data, it is often useful to combine surveys with other research methods, such as focus groups, to gain a depth of understanding. Indeed, Wolff al. (1993) note that:

> surveys lack the flexibility of qualitative approaches to pursue particular issues in any greater depth or to accommodate a wider range of explanatory categories than foreseen in the original questionnaire design. Surveys are also less adept at capturing the kind of in-depth contextual detail that focus groups can provide.

Thus, survey findings can be supplemented and enhanced with the addition of qualitative methods, such as focus groups.

While sometimes seen primarily as a research tool for fields such as business, focus groups are also a respected method for social research. Indeed, focus groups are a method of growing popularity in human geography (Conradson, 2005; Cameron, 2000), and are also useful for exploratory studies in health issues (Rice and Ezzy, 1999). Cameron (2000, p.101) notes that "focus groups [are] ideally suited to exploring the nuances and complexities of people-place relationships, whether research has a primarily data-gathering function or is more concerned with the collective practice of knowledge production." As well, Rice and Ezzy (1999, p.93) note that "focus groups can provide a window into the richness and complexity of social life in general and health behaviours in particular." Indeed, focus groups are excellent for exploratory research, as they allow for relatively open-ended questioning (Fern, 2001; Frey and Fontana, 1993). Thus, Kleiber (2004, p.101) notes that "[f]ocus groups should be recognized as a legitimate and important option for some questions for the unique yield they can contribute to understanding the world." It is these insights which are sought by any researcher, regardless of the method chosen.

Unique insights can be gained from focus group sessions because focus groups are concerned with understanding participants' points of view, and provide a respectful (Morgan and Kreuger, 1993) and interested atmosphere in which to express those points of view. Fittingly, focus groups are useful when researchers lack a depth of knowledge about groups of research participants (Rice and Ezzy, 1999). Focus groups may also serve to give a voice to those who may not be traditionally involved in research (Rice and Ezzy, 1999). Thus,

focus groups allow for an in-depth exploration of a topic, such as perceptions of the environment and health, while allowing individual voices to be heard. As such, focus groups are invaluable in obtaining in-depth information within a short period of time (Rice and Ezzy 1999). Indeed, this strength may be unique to focus groups, which allow for a range of participant expression, as well as non-expression, unlike during individual interviews, when a participant may feel obliged to answer questions. Thus, focus groups allow researchers to examine the spectrum of views held by participants on a particular issue, as well as participants' interaction regarding an issue, and can help to answer the question of why participants have particular views (Conradson, 2005). This may be especially true for their use in exploratory research.

Focus groups have several important features, such as: enabling in-depth discussion among participants; allowing interaction between participants; the presence of a moderator to assist and guide the discussion; and shared backgrounds or characteristics of participants (Rice and Ezzy; 1999, p.72). This characteristic of interaction separates focus groups from individual interviews (Rice and Ezzy, 1999), and can be a valuable source of data in a research (Duggleby, 2005). Indeed, these insights are especially valuable in qualitative research, as they are not achievable through interviews alone, and lead to a greater depth of insight regarding the research questions. These features contribute to the advantages of using focus groups as a research method. Advantages of using focus groups as a research method include: in-depth insight into issues discussion; the discovery of unexpected information related to the research topic; insight gained from group interaction; clarity of understanding through the opportunity to probe participants; and, gathering insight from groups which do not normally participate in research (Rice and Ezzy, 1999). Indeed, data may emerge during focus group sessions which the researcher does not expect (Bedford and Burgess, 2001). Finally, the potential influence of the interviewer on the interviewees is lessened by virtue of the nature of the group environment versus a one-on-one setting (Frey and Fontana, 1993). However, no method is perfect for every research question, and focus groups do have their limitations. Limitations of focus groups include: data gathered can only represent views of focus group participants; representative statistical data cannot be generated from focus groups; data reflects participants' views, but not necessarily their actions; moderators' views may influence data gathered from focus group participants (Rice and Ezzy, 1999). In

addition, focus groups may not allow for an individual's true views to be heard above those of the group (Conradson, 2005). As well, participants' confidentiality can only be assured to a certain extent, such that individual focus group members comply with this understanding. Finally, it should be noted that the researcher may have less control over focus groups than with other research methods, due to participant interaction; however, this can be seen as an advantage or a disadvantage, depending on existing power dynamics between participants and the researcher (Bryman, 2004; Morgan and Krueger, 1993).

Perhaps the most important feature of focus groups—as well as its most prominent advantage—is the interaction allowed between participants. Interaction between participants is a main advantage of using focus groups, and is both welcomed and encouraged in focus group sessions. Participant interaction during focus group sessions also contributes to focus groups as a more 'natural' method than that of individual interviews (Bryman, 2004). However, during focus groups, the issue of dominant participants may arise, wherein one or more members of a focus group tends to dominate the group discussion. In this case, moderators may use various strategies to encourage participation from shy or reticent participants and to curb participation among very vocal participants, such that each member of the group has a chance to speak; nonetheless, moderators often choose to allow latitude to participants, in order to obtain a wide range of views and interaction data (Bryman, 2004). While there can be a potential for interaction to lead to consensus-building, especially in groups where a large percentage of participants share similar views, the goal of focus group sessions is not to produce a consensus among the group, but to explore participants' responses in an open and encouraging environment, where it is made clear that there are no 'right' or 'wrong' answers (Kleiber, 2004). Indeed, as Patton (2002, p.385) reminds us, "[t]he focus group interview is, first and foremost, an interview." Thus, participants need not agree or, for that matter, disagree, with each other for a successful focus group session (Patton, 2002; Morgan and Krueger, 1993). Using probes to encourage the expression of previously unheard views, i.e., to gain a variety of responses, can help to ensure that a variety of voices are incorporated into the focus group discussion (Patton, 2002). Indeed, it is this variety of voices that researchers utilizing focus groups so often seek to achieve.

Obtaining a variety of views may be especially important for social researchers. When employing focus groups for this purpose, different groups are assembled, with the

same set of questions applied to each focus group in order to compare differences in answers—and perceptions—across groups. As Knodel (1993, 39) notes:

> [when] comparing views of people with differing backgrounds or attitudes toward the topic of discussion, the usual approach is to hold discussions with separate groups, each homogeneous within itself but differing in terms of particular characteristics specified as the selection criteria.

Also related to social diversity and the use of focus groups is the issue of language. In general, focus group sessions should be conducted in the language native to participants (Rice and Ezzy, 1999). Indeed, if language becomes a barrier, some participants may be reticent to participate during the focus group session (Fern, 2001). However, this reasoning assumes a group with a common linguistic or sociocultural background. Indeed, when conducting focus groups in which participants have differing native languages, this often becomes untenable. Yet, language is not the only issue relevant to considering perceptions across social groups. Ethnicity is also a salient factor for interaction between focus group participants, as well as their relationship to the moderator (Fern, 2001). Indeed, the social composition of focus groups is not only relevant to how the groups are facilitated and how they function, but may, in turn, influence the data collected (Fern, 2001). Thus, the issue of mutual respect is essential to focus groups in social research (Rice and Ezzy, 1999).

3.4.2 Triangulation

Use of multiple research methods, or triangulation, is increasingly relevant for geographical research (Graham, 1999; McKendrick, 1999). Triangulation involves using a combination of research methods, data sources, or theories in a research (Rice and Ezzy, 1999), and can thus strengthen a study through this combination of methods (Patton, 2002). As Rice and Ezzy (1999, p.38) indicate, "[r]esearch methods are not neutral tools that will produce the same result regardless of the method. Triangulation addresses this problem." However, accordingly, different types of data obtained through triangulation may demonstrate different results, as these data may measure different aspects of an issue (Patton, 2002). As such, triangulation seeks consistency, rather than uniformity, across data obtained (Patton, 2002).

Due to the exploratory nature of this research, this research utilizes methodological triangulation, which is the use of more than one particular method to study a specific issue.

This research utilizes both focus groups and surveys to explore participants' perceptions of the environment and health at various geographic scales. These methods support each other, both through specific responses, and the types of data obtained. Indeed, focus groups and surveys are often complementary research methods, and can together yield clearer results than those obtained through relying upon one method individually (Duggleby, 2005; Patton, 2002; Winchester, 1999; Frey and Fontana, 1993; Morgan and Krueger, 1993; Wolff et al., 1993). While both focus groups and surveys were used to examine Malton residents' perceptions of the environment and health, focus group discussions accomplish this qualitatively, while the survey makes use of Likert scales to rate perceptions, and can thus be considered quantitative.

3.4.3 Data Collection Using the Survey

In this research, a survey, the Malton Environment and Health Questionnaire,[49] was developed for use during focus group sessions, to supplement focus group data, and to determine sociodemographic characteristics of participants. The Malton Environment and Health Questionnaire was designed to give a picture of respondents' connectedness to their natural environment and to the Mimico Creek area, as well as to explore respondents' perceptions of the relationship between the Mimico Creek natural environment and health in their neighbourhoods. Initially, this survey was piloted during Malton community events, to ensure its effectiveness. The Malton Environment and Health Questionnaire contains both closed- and open-ended questions. For close-ended questions, it is important for answer options to be clear, comprehensive, and mutually exclusive (Gray and Guppy, 2003). The inclusion of an 'other' category can help participants who may not be sure how to answer; yet, too many 'other' responses can indicate unexpected responses, and thus the need for an open-ended question (Gray and Guppy, 2003). Therefore, with the use of Likert scales in surveys, it is important to choose the number of categories well. Conversely, advantages to open-ended questions are that they can allow participants to speak in their own words; they allow for unpredicted answers; and they provide a break from lists and scales in the survey (Gray and Guppy, 2003).

[49] A copy of the survey can be found in Appendix 2.

Due to the exploratory nature of this research, initial versions of the survey were tested with the general Malton community at two community events: Malton Stewardship Day, in Wildwood Park, April 23, 2005; and the Malton Festival, at the Malton Community Centre, September 17, 2005. The initial pilot version was tested at the Malton Stewardship Day, and revisions were undertaken, with attention to participants' suggestions. A second pilot version was tested at the Malton Festival, and later slightly modified to become the final version. At both stages, participants'[50] comments and suggestions were taken into consideration when developing the final version of the survey. Initial results were discussed with MESP, and the survey was streamlined to better suit the research questions for this research.[51] From the piloting of initial versions of the survey, as well as the author's and MESP's conversations with community members regarding the environment and health in Malton, the final version of the Malton Environment and Health Questionnaire emerged.

The survey contains questions related to connectedness to the natural environment, the Mimico Creek area, individual and neighbourhood health, and social composition (e.g., age, gender, cultural/ethnic origin and socioeconomic status). The survey was divided into three sections: 'Connection to the Natural Environment,' concerned with participants' general attitude toward the environment; 'The Mimico Creek and Health,' concerned with participants' views regarding the Mimico Creek and Health in Malton; and a section for sociodemographic information. This order is similar to that of focus group discussions. Primarily, the survey utilizes 5-point Likert scales to rate participants' perceptions in response to several questions. Likert scales provide survey respondents with the option to rate their responses in a set of a bi-polar categories, for example, agree/disagree, important/not important, with numbers that correspond to varying response categories (see Burger, 2005; Gray and Guppy, 2003; Singleton and Straits, 1999). However, as Burger (2005) describes, rating scales are limited in their ability to accurately reflect participants' responses. These scales may be limited if, for example, lists provided do not fully encompass the views of participants, and if the ordering of questions and list items affects participant responses (Burger, 2005). In addition to the use of Likert scales, there are some

[50] To the author's knowledge, only one participant who completed the initial, pilot version of the survey was subsequently involved in a focus group session.

[51] At this time, a second line of research was created which is overseen by MESP. Also at this time, a separate version of the Malton Environment and Health Questionnaire, which reflects MESP's own research priorities, was developed for use by MESP. This survey has been employed at the 2005 Malton Health Fair and the 2006 Malton Stewardship Day, and will be utilized at future community events by MESP.

close-ended yes/no questions. Finally, the survey contains some open-ended questions where close-ended questions were perceived to be inadequate.

To commence focus group sessions, participants were asked to complete a copy of the Malton Environment and Health Questionnaire,[52] which set the stage for focus group discussions. Most participants completed the survey in approximately 10 minutes.[53] Focus group discussion followed completion and collection of all the surveys.

3.4.4 Exploring Participants' Perceptions through the Survey

The content of the survey draws upon Eisler et al.'s (2003) exploration of perceptions of human ecology, as well as Mayer and Frantz's (2004) 'connectedness to nature scale'[54] (CNS). Gender and cultural differences have been shown to exist in environmental attitudes, environmental knowledge, and environmental behaviour (Johnson et al., 2004; Eisler et al., 2003; Virden and Walker, 1999). Mayer and Frantz (2004) developed a unique scale to measure individuals' feelings of community with nature, the Connectedness to Nature Scale (CNS), and showed that connectedness to nature is a predictor of both ecological behaviour and individual well-being. It should be noted that no uniform or comprehensive definition of 'connectedness' to nature exists in the literature, perhaps due in part to the relative newness of the topic in the environmental psychology literature. Generally speaking, the idea of humans being relatively connected to nature, although only recently quantified, has long been present in the environmental literature (Schultz et al., 2004). However, as Schultz et al. (2004, p.40) observe, "despite the centrality of the concept of connectedness in the environmental literature, only a few studies have operationalized it using explicit measures." The connectedness to nature scale is one such attempt to operationalize this concept. For the purpose of defining what characterizes connectedness to nature, Schultz et al. (2004, p.32) explain that an individual who is considered to be 'connected' to nature "believes that s/he is just as much a part of nature as are other animals and (taken to the extreme) that the same rights that apply to humans should apply to plants and animals." While many conceptions of

[52] Participants from the LINC5 group completed only the last section of the survey, listing sociodemographic information, as the language on the survey was inappropriate for the level of the class.
[53] Participants experiencing difficulties with the language on the survey—mostly from the LINC5 group—were aided by the moderator.
[54] Mayer and Frantz (2004) use the Connectedness to Nature Scale to predict behaviour towards the environment and subjective well-being. However, an adapted version of the CNS is used in this research to relate participants' perceptions of their personal connection to the natural environment with their perceptions of neighbourhood health, in particular, the Mimico Creek area and health in Malton.

humans' connection to nature exist throughout the literature, it is this definition which underlies Mayer and Franz's connectedness to nature scale. Research has also shown that attitudes toward environmental issues are related to individuals' self-described connections with nature (Schultz et al., 2004). Interestingly, sociocultural variation in individuals' connectedness to nature is also a compelling and relatively unexplored topic (Schultz et al., 2004). Finally, while there exist studies which compare connections with, and perceptions of, natural environments and nature across countries (Schultz, 2001), this question has not been yet examined at smaller scales. Thus, this represents an interesting and relatively unexplored area of research.

This research draws upon the literature to develop the Malton Environment and Health Questionnaire; however, as noted, research into connections to nature and environmental perceptions is still in its initial stages. Furthermore, linking connectedness to, and perceptions of, nature to health at the local level is a new endeavor. However, it was expected that scales like the CNS would be useful ways to explore individuals' perceptions of their natural environment, and that these general-level perceptions could be linked to the local scale. The first section of the Malton Environment and Health Questionnaire, 'Connection to the Natural Environment' is indeed based upon the CNS, and attempts to uncover participants' connectedness to the natural environment. It was expected that participants' perceptions of their connectedness to nature could then be related to their perceptions of the Mimico Creek environment and health at the local level. In developing the survey, it was expected that by employing questions related to perceptions of the environment and health—connectedness to the natural environment at a general scale and perceptions of Malton's environment and health at a local scale—in conjunction with questions relating to perception of individual[55] and neighbourhood health, it would be possible to gain a wider picture of participants' perceptions of the relationships between the natural environment and health. Indeed, inclusion of these issues on the survey serves to

[55] Participants' perceptions of their personal health were explored using self-rated health, which has been shown to be a valid predictor of mortality (see, for example, Lyyra et al., 2006; Benjamins et al., 2004; Kawada, 2003; Burstrom and Fredlund, 2001; Idler and Benyamini, 1997), over and above existing health status (Murata et al., 2006); in turn, behavioral and biomedical risk factors and biomarkers have been shown to predict self-rated health (Jylha et al., 2006; Froom et al., 2004). In addition, self-rated health has been shown to be subject to area effects (Pampalon et al., 1999) and, in particular, neighbourhood socioeconomic environments (Malmstrom et al., 1999). For a discussion of individuals' understanding of the question of self-rated health, see Manderbacka (1998).

explore participants' perceptions of the link between the Mimico Creek natural environment and health at the individual and neighbourhood levels, the primary focus of this research.

3.4.5 Data Collection Using Focus Groups

In general, focus groups should involve a small group of participants who share certain sociodemographic or sociocultural characteristics or who have similar experiences or concerns (Kleiber, 2004; Patton, 2002; Cameron, 2000). Focus groups were conducted with Malton community groups to explore participants' perceptions of the natural environment and health at various geographic scales. Focus group sessions generally lasted from 40 minutes to an hour and, in the case of groups conducted with school classes, were constrained by time allotted to the class period. Focus group sessions were recorded with a digital audio recorder[56] and later transcribed. Digital recording is recommended for all focus group sessions (Bryman, 2004; Fern, 2001; Cameron, 2000; Rice and Ezzy, 1999). With the help of a recording, focus group discussions can be transcribed for data analysis. Of the many advantages to recording a focus group session, perhaps the most important is the ability to pay closer attention to the participants' words and gestures. Recording of sessions frees up the researcher to engage with the participants, instead of taking notes. In addition, recording captures nuances in communication that are not easily expressed through written notes alone. However, the quality of the transcript depends upon the quality of the recording, so it is essential to have a working recorder without much background noise in order for this method to be worthwhile. The author also served as moderator for all focus group sessions, and was able to take brief notes.

During focus group sessions, participants were seated as closely to circular form as the room allowed, to facilitate discussion; however, usually, this meant around a rectangular table. To begin each focus group session, the moderator introduced the purpose of the research and the focus group session. The moderator then indicated that the sessions would be recorded for transcription purposes, and that the sessions shall remain confidential. After distributing information letters and consent forms, then collecting completed consent forms, the moderator led the group in brief introductions. Participants were then asked to complete

[56] During the LINC5 session, the recorder was not functioning properly, and the teacher of the LINC class was kind enough to provide the author with an audiocassette recorder. Consequently, this session was able to be taped entirely through; however, audio quality differs in this session from that of other sessions.

the Malton Environment and Health Questionnaire. During focus group discussions, specific issues introduced on the survey were explored in greater detail. Focus group questions[57] were divided by geographic scale, in order to explore participants' perceptions of the natural environment and health across scales. First, participants were asked about the environment and health at a broad, general level; next, participants focused on the neighbourhood scale; and, finally, participants focused on the local environment of the Mimico Creek, which was the main topic of each focus group session.

Several community groups graciously agreed to participate in focus group sessions. Focus groups were conducted with the St. Mark's Presbyterian Church, classes from Lincoln Alexander Secondary School, the LINC5 class at Malton Neighbourhood Services, and the Malton Black Development Association. Focus group sessions were conducted in places comfortable to participants.[58] The literature demonstrates that focus groups should generally be a small size, of generally 6-10 people (Fern, 2001; Cameron, 2000; Rice and Ezzy, 1999). However, in this research, limiting focus group sessions to this size was often not possible, as entire classes from the Grade 11 Family Studies class at Lincoln Alexander (LA11 group), and the LINC5 class at Malton Neighbourhood Services, were involved in focus group sessions. It was not possible to involve students from these classes in a separate environment, utilizing a smaller group, so focus groups were conducted with these classes individually. Location is very important for conducting interviews with participants (Valentine, 2005; Kleiber, 2004; Bedford and Burgess, 2001; Cameron, 2000). Thus, in order to involve participants in focus groups, these sessions were conducted at the most convenient place for each group. Focus group sessions were conducted in familiar locations for each group of participants: at their church for the St. Mark's Presbyterian Church participants; in classrooms at their school (during class time) for the Lincoln Alexander Secondary School participants; in their classroom (during class time) for the LINC participants; and at the Malton Community Centre (prior to their meeting time) for the Malton Black Development Association.

In this research, all focus group participants belonged to the existing social groups indicated, and were all residents of Malton. Clearly, conducting focus groups with existing community groups means that nearly all participants already knew each other, and were in

[57] A copy of the focus group questions can be found in Appendix 2.
[58] For a discussion of the importance of location for interviews, see Elwood and Martin (2000).

some cases friends. Indeed, recruitment of existing Malton community groups allowed for the formation of what Conradson (2005) terms 'natural' focus groups, in that these groups reflect pre-existing social groups. This can be considered as an advantage, as it is generally necessary for focus group participants to have shared experiences to unite them in a productive discussion. Yet, while this often facilitates conversation among group members, the possibility exists that group members may also be less likely to express dissenting opinions (Conradson, 2005). However, inasmuch as familiarity serves to raise the comfort level of a group, this may also enhance the willingness of participants to be forthcoming with their answers during focus group sessions.

3.4.6 Exploring Participants' Perceptions through Focus Groups

Due to the exploratory nature of this research, semi-structured questioning was used and all participant responses to questions were recorded. During focus groups, issues addressed in the questionnaire were examined in greater detail. Focus group audio files were transcribed using Philips audio transcription software. Focus group transcriptions were then compared with notes taken for each focus group session. In all cases, notes taken were peripheral to the transcripts, but did help for recall of specifics during each focus group session. Focus group transcriptions were then coded by question and theme,[59] with special attention to key themes emerging from the focus group sessions. This was a challenging process; however, focus group data can often be difficult to analyze, owning to amount and breadth (Bryman, 2004). An evolving set of codes was created for each question, and commonalties in responses were observed within and across geographic scales. From participants' responses, emergent themes were identified, which, in many cases, were unanticipated responses. These themes are presented in chapter 4.

3.4.7 Ethics Review

To gain participants in a qualitative research, ethical review is a necessity. As such, all qualitative research must address ethical elements related to research participants. In particular, attention to whether a study is likely to cause participants' distress, as well as efforts to ensure confidentiality to participants, are necessary measures for qualitative

[59] This ordering was partly to preserve discussion by geographic scale, as participants were asked similar questions at the scales of 'environment' (general), 'neighbourhood', and 'Mimico Creek' (local/neighbourhood feature).

research (Rice and Ezzy, 1999). As such, the informed consent process is essential for qualitative research.

At the University of Toronto, ethical reviews are required for all research including human subjects, regardless of the level of perceived risk to participants from participation in a particular research. As such, this research underwent two phases of ethical review (with two ethics protocols), and one amendment to allow for the inclusion of younger participants. These are discussed, in turn.

An initial ethics protocol was created for the first version of the Malton Environment and Health Questionnaire, piloted at the 2005 Malton Stewardship Day. Copies of the pilot survey and consent documents were submitted to the University of Toronto's Ethics Review Office for expedited review.[60] The pilot survey was approved for immediate use by the Ethics Review Office through the expedited review process.

A second ethics protocol was created for this research, as a whole, to allow the author to conduct focus group sessions (which involved the completion of the survey) with members of the Malton community. Copies of the survey, focus group questions, and consent documents[61] were submitted to the University of Toronto's Ethics Review Office for expedited review. This research was approved for a one-year study period by the Ethics Review Office through the expedited review process.

Finally, an amendment to this protocol was submitted in order to allow youth 14-15 years of age to participate in focus group sessions held at Lincoln Alexander Secondary School during students' class time. Copies of the parental information and consent form[62] and (participant) consent documents were submitted for expedited review. This amendment was also approved for immediate inclusion through the expedited review process.

3.5 Data Analysis

3.5.1 Surveys

Surveys completed during focus group sessions were analyzed using SPSS. Firstly, frequencies were calculated for each survey question, including sociodemographic

[60] The expedited review process can be utilized for research that is considered to be of minimal risk, where the level of risk posed by the research is anticipated to be "no greater than those encountered by the subject in those aspects of his or her everyday life" (Ethics Review Office, Date Unknown).
[61] Copies of the information letter and consent form can be found in Appendix 1.
[62] A copy of this document can be found in Appendix 1.

information. These are reported in chapter 4. Secondly, participants' relative 'connectedness' to the natural environment was examined. The first section of the survey sought to measure 'Connection to the Natural Environment,' through a series of statements[63] which allowed participants to answer in terms of how connected to the environment they normally feel. From this section, an index was created in SPSS which measured participants' relative 'connectedness' or 'disconnectedness' to the natural environment. This index, the Connection to the Natural Environment (CNE) Index, was analyzed using cross-tabs with every other survey question, including sociodemographic information. The reliability of this index was low: alpha=.514.[64] Questions from this section were also analyzed individually, and cross-tabs were performed with individual questions and related questions from other sections of the survey, including sociodemographic information. Finally, questions on the second section of the survey, 'The Mimico Creek Environment and Health,' were examined. Cross-tabs were preformed between related questions within this section, and with sociodemographic information. While sample size of 71 participants was not sufficient to examine statistical significance between survey questions, chi-square tests (95% significance) were run for all studied questions in order to determine if any relationships between questions proved to be statistically significant. Interestingly, relationships between some questions examined were found to be statistically significant. Survey results are presented in chapter 4, along with focus group results.

3.5.2 Focus Groups

Digitally-recorded focus group audio files were transcribed[65] using Phillips transcription software for PCs. Transcriptions were hand-coded, and emergent themes were identified. Transcriptions were then re-coded to include categories of emergent themes, and organized by scale (to follow the order of focus group questions) and by question. Quotes representative of each emergent theme were organized in Microsoft Word. Emergent themes

[63] See Appendix 2 for a full list of statements under 'Connection to the Natural Environment.'
[64] This index was modelled after the Connectedness to Nature Scale (CNS), presented in Mayer and Frantz (2004), which has a high reliability, alpha=.84. However, the index used in this research also added questions thought to be relevant for this research, not found in the CNS. Due to the low reliability of this index, it could be argued that the CNS should have been used in this research, or these questions should have been omitted to raise the reliability of the CNE index. Certainly, future research would benefit from modifying this index to increase its reliability.
[65] Each transcript was read over at least twice for accuracy.

were then examined in the literature, in order to make connections to existing bodies of knowledge, and to contextualize research findings.

3.6 Researcher's Positionality

Positionality of the researcher can play an important role in conducting geographical research (see, for example, Gold, 2002; Butler, 2001; Elwood and Martin, 2000; Rose 1997; England, 1994). In particular, it is clear that positionality of a researcher is a notable factor in conducting research with diverse populations. Thus, positionality is a relevant consideration in this research. The Malton community is known for its ethnocultural diversity—that is, for the presence of numerous communities within a larger community. As such, in a multicultural community such as Malton, it is impossible for the ethnocultural background of the researcher to match that of each participant. Nonetheless, in conducting focus group sessions with social groups in the Malton community, a few issues of positionality and credibility may become apparent. For one, this master's project constitutes my first attempt at leading focus groups. In addition, it was expected that factors such as my [relatively young] age, [female] gender, [English-Canadian] ethnic background, relative research inexperience, and status as an outsider in the community, might make it more difficult to receive a positive community response than if these factors were not apparent.

In order to account for my research inexperience, I took steps to prepare for this research by enrolling in the CBR certificate offered by the Wellesley Institute (formerly, the Wellesley Central Health Corporation). This involved participating in workshops on the following topics: conducting community-based research; conducting research with ethnoracial and 'racialized' populations; using effective survey tools; and conducting focus groups with diverse community groups. I feel that these experiences better prepared me for this research, especially given the diverse nature of the Malton community. Any oversights in preparation are of course my own; however, it is my sincere hope that patience, compassion and tolerance expressed by all parties helped to facilitate this research in a socially diverse context. In addition, it was hoped that close collaboration with the Malton Environmental Stewardship Project, which seeks to cultivate ties within the community, would be a valuable asset to this research. Indeed, MESP facilitated many relationships with diverse social groups within the Malton community—both with groups who chose to

participate in this research, as well as those who did not—which was invaluable in gaining access to the community. While some groups were not able to participate in this research, it is unlikely that this is a function of the author's positionality.[66]

In conclusion, I cannot claim to speak for members of the Malton community; however, I have tried to present their participation in this research respectfully, and with a view to the context of this research. While findings of this exploratory research cannot be generalized to the population level—as with any qualitative study that seeks understanding, rather than representativeness—it is my belief that this research nonetheless provides valuable insight into a diverse Canadian community, and how some of its residents negotiate issues related to the environment and health.

3.7 Summary

In summary, this chapter has outlined the methodological framework and methods used in this research. This chapter has discussed the qualitative methodological framework used to shape this research, and has introduced the exploratory nature of this research. This chapter has outlined participation in this research by Malton community groups, and has also examined the ethics process essential for such qualitative research. Access to Malton community groups was achieved through gatekeepers and key contacts, who were essential for recruitment this diverse community. The role of the Malton Environmental Stewardship Project (MESP) as a gatekeeper contact, who provided a 'door' to the Malton community is thankfully acknowledged. This chapter also introduced the survey and focus groups as research methods utilized in this research. This chapter has discussed the development of survey and focus group questions, and has introduced the use of these methods in exploring participants' perceptions of the environment and health. Issues related to conducting focus group sessions with the Malton community were discussed. Community participation in this research is gratefully acknowledged.

[66] This is because both groups initially agreed to participate. One non-participating group cancelled, presumably due to other priorities, while and another group agreed and was scheduled, but lacked the participation numbers to conduct a focus group session.

Chapter 4: Results

4.1 Introduction

This chapter presents results of focus group sessions conducted with participants from Malton community groups. Results from surveys and focus group sessions are discussed and compared.[67] To commence focus group sessions, participants were asked to complete a copy of the Malton Environment and Health Questionnaire,[68] which set the stage for focus group discussions. On the opening section of the survey, participants were asked to answer eleven questions related to their views of the natural environment. The aim of this section was to determine participants overall connectedness to the natural environment, as participants' connectedness to the natural environment, as a whole, may serve to influence their views of the importance of the natural environment for their health and well-being. As well, participants' overall connectedness to the natural environment may serve to influence their perception of the Mimico Creek area and its importance for health at the individual and neighbourhood levels. In the second section of the survey, participants were asked to focus on the topic of the Mimico Creek and Health in Malton. This section focused primarily on links between the Mimico Creek and health. While the sample size[69] for this survey was not sufficient to examine statistical significance between questions, interestingly, relationships between some questions examined were found to be statistically significant. However, while survey results can be used to gauge participants' perceptions, they do not provide insight into the reasons for these perceptions. As such, examining focus group discussions serves to shed light on patterns in survey results. These relationships are discussed, along with connections between survey results and focus group discussions, in the following sections. Results from focus group sessions are organized broadly by scale, from larger to smaller scales,[70] with a focus on emergent themes.

Firstly, Section 4.2 discusses sociodemographic characteristics of participants. Section 4.3 discusses participants' connectedness to the natural environment, and presents results from this opening section of the survey. Section 4.4 presents the topic of the

[67] Supplementary results from the survey (not discussed in this chapter) can be found in Appendix 3.
[68] Participants from the LINC5 group completed only the last section of the survey, listing sociodemographic information, as the language on the survey was inappropriate for the level of the class.
[69] N=71
[70] In keeping with the order during focus group sessions.

environment and health at a broad scale, as discussed in focus group sessions. Section 4.5 presents the topic of the environment and health at the neighbourhood level, as discussed in focus group sessions. Links between the environment and health are presented at the neighbourhood level, and issues raised by focus group participants at this scale are explored. Section 4.6 presents the results from focus group sessions related to the Mimico Creek environment and health in Malton. This section integrates results from the survey, and explores issues raised by participants concerning the Mimico Creek and health at the individual and neighbourhood levels. This section also explores participants' suggestions for improving the Mimico Creek in order to improve health. Lastly, section 4.7 presents a chapter summary.

4.2 Participant Sociodemographics

This section outlines participant sociodemographics, to give a picture of the research participants. The majority of participants were male (55.7%). However, age was not evenly represented. The age distribution of participants' is shown in Table 4.1[71] below:

Table 4.1: Participants' Ages

Age	Number of Participants	Percent
14-17	30	42.8%
18-20	7	10.0%
21-24	6	8.6%
25-29	2	2.9%
30-39	4	5.7%
40-49	3	4.3%
50-59	3	4.3%
59-64	6	8.6%
65+	9	12.9%

Due to the number of focus group sessions conducted with students at Lincoln Alexander Secondary School, younger people, those aged 14-17 years, constituted the largest group of total participants, 42.8%. Seniors, those aged 65 and older, constituted the second largest age group, with 12.9% of participants. Other age categories consisted of 10% or less of participants: those 18-20 accounted for 10%; those 21-24 and 59-64 accounted for 8.6%

[71] One participant declined to list their age; thus, the percent listed for each category is the valid percent.

each; and those aged 30-39 accounted for 5.7% of participants. Other age categories each accounted for less than 5% of participants.

As mentioned, all participants were residents of Malton at the time this research was conducted. However, many participants were also relative newcomers to both the Malton area and Canada (see Table 4.2 and Table 4.3). The City of Mississauga accepts many newcomers to Canada each year, and many settle in the Malton area. In fact, the majority of Malton residents are immigrants to Canada.[72] Participants' length of residency in Canada is shown in Table 4.2 below:

Table 4.2: Participants' Length of Residency in Canada

Length of Residency	Number	Percent
Less than 1 Year	5	7.0%
1 to 4.9 Years	22	31.0%
5 to 9 Years	17	23.9%
10 to 19 Years	17	23.9%
20- 39 Years	8	11.3%
40 + Years	2	2.8%
Total	71	100.0%

Participants' length of residency in Malton is shown in Table 4.3 below:

Table 4.3: Participants' Length of Residency in Malton

Length of Residency	Number	Percent
Less than 1 Year	4	5.6%
1 to 4.9 Years	21	29.6%
5 to 9 Years	10	14.1%
10 to 19 Years	21	29.6%
20+ Years	15	21.1%
Total	71	100.0%

Participants' average length of residence in Canada was 16.2 years, while participants' average length of residence in Malton was 10.6 years. Yet, it should be noted that participants' length of residence in Malton—and in Canada, as a whole—varied widely by focus group session. Many participants from the Lincoln Alexander Secondary School groups are first-generation Canadians or came to Canada when they were children. Many participants from the St. Mark's groups and the Malton Black Development Association

[72] Please see section 2.3.3 for a sociodemographic background of Malton.

were either born in Canada, or have lived in Canada—indeed, many in Malton itself—for a considerable period of time. This is in contrast to participants from the LINC5 group, who had clearly been in Canada the shortest period of time.[73] In fact, one participant from the LINC5 class had been in Canada from India for only two weeks before she participated in the LINC5 focus group session. Indeed, length of residence and language barriers may have, at first glance, created challenges for the participation of the LINC5 group; however, this group was eager to participate and lend their views.

As noted, many Malton residents have moved to Malton from other countries. Participants were asked to list their country of birth. Participants' countries of birth are shown in Table 4.4[74] below:

Table 4.4: Participants' Countries of Birth

Country	Number of Participants	Percent
Canada	14	20.6%
England	1	1.5%
Barbados	1	1.5%
Scotland	1	1.5%
Ireland	1	1.5%
Guyana	4	5.9%
Ghana	4	5.9%
Jamaica	9	13.2%
Switzerland	1	1.5%
The Netherlands	2	2.9%
India	18	26.5%
Pakistan	3	4.4%
Libya	1	1.5%
Sri Lanka	1	1.5%
Trinidad and Tobago	2	2.9%
Iraq	1	1.5%
Syria	1	1.5%
Columbia	2	2.9%
Poland	1	1.5%

In descending order, the most frequently listed countries of birth were: India (26.5%); Canada (20.6%); Jamaica (13.2%); Guyana (5.9%) and Ghana (5.9%);[75] and Pakistan

[73] This makes sense, given that the LINC classes are 'Language Classes for Newcomers to Canada.'
[74] Three participants declined to list their country of birth; the percentage in the table shows the valid percent of participants from each country.
[75] These countries are tied for fourth most common mention.

(4.4%). Other countries, such as, Trinidad & Tobago, Columbia, The Netherlands, and others, each represented less than 3% of participants. This can be compared to Malton, as whole. For example, in 2001, the top five countries of origin for immigrants to Malton were India, Jamaica, Italy, Guyana, and Pakistan (Mohanty and Alves, 2004). Thus, this ranking is similar to that of Malton as a whole, although it was not the goal of this research to attain a representative sample of participants.

Participants were also asked to list to which ethnic or cultural group their ancestors belonged. It should be noted that this was an open-ended question, which allowed participants to indicate their ethnic-cultural heritage in their own words. The ethnic/cultural groups of participants' ancestors is shown in Table 4.5[76] below:

Table 4.5: Ethnic/Cultural Groups of Participants' Ancestors

Ethnic/Cultural Group	Number of Participants	Percent
Scottish	3	4.8%
English	3	4.8%
Barbadian	1	1.6%
Irish	1	1.6%
East-Indian	4	6.3%
Ghanaians	2	3.2%
Jamaican	3	4.8%
Indian	14	22.2%
European	1	1.6%
Dutch	1	1.6%
Vietnamese	1	1.6%
Sikh	6	9.5%
Pakistani	3	4.8%
Sri Lankan	1	1.6%
French	1	1.6%
African	4	6.3%
Punjabi-Sikh	6	9.5%
Syrian	1	1.6%
Spanish	2	3.2%
Polish	1	1.6%
Black	2	3.2%
Afro-West-Indian	1	1.6%
Mixed	1	1.6%

[76] Eight participants declined to list the ethnic/cultural group of their ancestors; the percent shows the valid percent.

In descending order, the most frequently listed groups were: Indian (22.2%); Sikh (9.5%) and Punjabi-Sikh (9.5%); East Indian (6.3%) and African (6.3%); Scottish (4.8%), English (4.8%), Jamaican (4.8%), and Pakistani (4.8%); and Ghanaian (3.2%), Spanish (3.2%) and Black (3.2%). Other groups, such as, Barbadian, Irish, Mixed, and others, each accounted for less than 2% of participants. This list gives an idea of the ethnic or cultural heritage of participants, in their own words. It is notable that, like the Malton population as a whole, the largest group sampled identified as Indian, or as an Indian cultural group.

Participants were also asked to list to which ethnic or cultural group they themselves most identify. The self-identified ethnic/cultural heritage of participants' is shown in Table 4.6[77] below:

Table 4.6: Participants' Self-Identified Ethnic/Cultural Heritage

Ethnic/Cultural Group	Number of Participants	Percent
Canadian	9	15.5%
British	1	1.7%
Black	4	6.9%
Dutch	1	1.7%
Irish	1	1.7%
East-Indian	2	3.4%
Ghanaians	1	1.7%
Indian	6	10.3%
Sikh	9	15.5%
Guyanese	2	3.4%
Pakistani	2	3.4%
Jamaican	3	5.2%
Sri-Lankan	1	1.7%
Trinidadian	1	1.7%
African	2	3.4%
French Canadian	1	1.7%
West-Indian	1	1.7%
Afro-Canadian	2	3.4%
Asian	1	1.7%
Punjabi-Sikh	3	5.2%
South Asian	1	1.7%
Syrian	1	1.7%
Latin American	2	3.4%
European	1	1.7%

[77] Thirteen participants declined to list their self-identified ethnic/cultural group; the percent shows the valid percent.

In descending order, the most frequently listed groups, to which participants indicated that they most identify, were: Canadian (15.5%) and Sikh (15.5%); Indian (10.3%); Black (6.9%); Punjabi-Sikh (5.2%) and Jamaican (5.2%); and East Indian (3.4%), Guyanese (3.4%), Pakistani (3.4%), African (3.4%), Afro-Canadian (3.4%), and Latin American (3.4%). Other groups, such as, British, Ghanaian, Trinidadian, and others, each represented less than 2% of participants. It is notable that participants' present ethnic or cultural associations differ from that of their family backgrounds. This difference was related to participants' length of residence in Canada. Understandably, newcomers to Canada from the LINC5 group primarily identified with their home countries and cultural groups.

Participants were also asked to indicate their approximate level of household income during the year 2004, though, many participants chose not to answer this question.[78] However, of those participants who did, the most frequently listed amounts, in descending order, were: $20,000-29,999; $70,000-79,999; and $50,000-59,999. The distribution of household incomes listed by participants is shown in Table 4.7[79] below:

Table 4.7: Participants' Combined Household Incomes, 2004

Household Income	Percent
Less than $20,000	17.4%
$20,000 to $29,999	30.4%
$30,000 to $39,999	8.7%
$40,000 to $49,999	0.0%
$50,000 to $59,999	13.0%
$60,000 to $69,999	0.0%
$70,000 to $79,999	17.4%
$80,000 to $89,999	4.3%
$90,000 to $99,999	4.3%
$100 or more	4.3%

[78] This is partly due to the fact that three focus group sessions were conducted with students from Lincoln Alexander Secondary School. I instructed these students to leave this question unanswered, as they could not be reasonably expected to know their level of household income, neither could they reasonably be asked to indicate their household income, even if they had this knowledge. Thus, of those who did indicate their income, nearly all were adults from the SM1, SM2, LINC5, and MBD groups.

[79] Only 32% of participants listed their incomes; however, as noted, this is due to the high number of student participants. The income categories are shown to illustrate the distribution of incomes among participants; however, it should be recognized that the true distribution may differ if the Lincoln Alexander participants were also included.

These values are similar to average family incomes in Malton. As discussed, Malton is considered to be a low-income area, in relation to other communities in the City of Mississauga.[80]

Thus, although it was not the goal of this research to include participants such that this sample is representative of the Malton population, diverse group of participants chose to lend their time to this research. For example, in this research, the Indian cultural group was most prominent, as it is the single largest cultural group in Malton, as a whole. The Jamaican and Guyanese cultural groups were also prominent in this research. While not statistically representative of Malton's population, the group of participants in this research nonetheless reflects diversity, which is clearly appropriate for a research conducted with this vibrant and growing community.

4.3 Exploring 'Connectedness' to the Natural Environment

In this section, participants' connectedness to the natural environment is presented and discussed.[81] The first section of the survey was used to measure participants' 'Connection to the Natural Environment,' through a series of eleven statements[82] which allowed participants to answer in terms of how connected to the environment they normally feel. These statements formed an index termed the Connection to the Natural Environment (CNE) Index, which seeks to explore participants' relative 'connectedness' or 'disconnectedness' to the natural environment. While the reliability of this indicator was low,[83] this index was analyzed in relation to all other survey questions, and results are reported here to contextualize participants' responses.

The CNE Index ranged from 0 to 16, with 16 being the highest possible score on the index. Overall, many participants scored near the mean (7.66) of the index, with 53.6% scoring above the mean, and 46.4% scoring below the mean. The highest percentages of participants, 12.5%, scored either 6 or 7 on the scale. Interestingly, as many participants

[80] Refer to section 2.3.3 for a sociodemographic background of Malton.
[81] Links between participants' connectedness and their responses during focus groups are discussed in upcoming sections.
[82] These are statements a-k; however, statements b and k were eliminated for the sake of analysis. Please consult the survey in Appendix 2 for specific wording of questions.
[83] alpha=.514

scored 16, the maximum value, as scored 0.[84] Given participants' responses to the first section of the survey, it is difficult to assess whether participants were relatively 'connected' or 'disconnected' from the natural environment. This is in turn complicated by the low reliability of the CNE index itself. Since many participants scored around the mean, which was itself very close to the median, it could be argued that participants in this research were neither particularly 'connected' nor 'disconnected' from the natural environment. This, in itself, may be useful, as it could be argued that participants' relative degree of connectedness may inform their responses to the remainder of the survey, concerning the Mimico Creek environment and health.[85]

The CNE index was compared with all other survey questions using cross-tabulations; yet, the relationship between the index values and responses to other questions was found to be tenuous.[86] For example, scores on the CNE index did not vary significantly by gender or age. However, a few significant relationships were found between the CNE index[87] and other survey questions. For example, a statistically significant[88] relationship was found between participants' responses to the CNE index and their responses to how important is the Mimico Creek for the health of individuals in their neighbourhood[89] ('The Mimico Creek and Health' section, question 5c). Participants who scored above the mean on the CNE index were more likely to indicate that the Mimico Creek is relatively important for the health of individuals their neighbourhood.

Although the intended use of the questions exploring participants' connectedness to the environment was as an index, participants' responses were also explored using individual questions.[90] In this section of the survey, five statements related positively to connectedness with the natural environment, such that agreeing with these statements indicates a relatively high degree of connectedness.[91] Results to individual questions are shown in Table 4.8[92] below:

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[84] While the participants who scored 0 were not neutral for each statement, their statements were such that an overall value of 0 (representing relative connectedness) was scored.
[85] In a way, it could be considered an advantage to have participants who are neither especially 'connected' nor 'disconnected,' as having either tendency could limit the type of responses received during focus group sessions. However, again, the relative reliability of the index makes it difficult to truly assess participants' levels of 'connectedness.'
[86] For cross-tabs of the CNE index with other survey questions, including non-significant values, see Appendix 3.
[87] Here, the CNE index responses were analyzed using those 'above mean' and 'below mean' for simplicity of analysis.
[88] Using Chi-square tests at the 95% significance level.
[89] $p<0.027$
[90] This is partly due to the low reliability of the CNE index itself.
[91] These are statements a, e, h, i, and j. Please consult the survey in Appendix 2 for specific wording of questions.

Table 4.8: Participants' Responses – Relative Connection to Nature

Question	Agree (%)	Neutral (%)	Disagree (%)
1a: "I often feel a sense that I am connected to the natural environment"	45.5	36.4	18.2
1e: "How my actions affect the natural environment is important to me"	60.7	25.0	14.3
1h: "I consider the natural environment to be important to my well-being"	83.9	10.7	5.4
1i: "I consider the natural environment to be important to children's well-being"	83.9	10.7	5.4
1j: "I have participated in an activity or experience that has made me feel a strong connection with the natural environment in the past 2 years"	38.2	40.0	21.8

About half of participants, 45.5%, indicated that they agree[93] with the statement, "I often feel a sense that I am connected to the natural environment" (question 1a). In answering this question, participants implicitly employed their own interpretation of what it means to be connected[94] to the natural environment. As well, additional questions help to contextualize the issue to connectedness to the natural environment. Over half of participants, 60.7%, indicated that they agree with the statement, "How my actions affect the natural environment is important to me" (question 1e). A large majority of participants, 83.9%, indicated that they agree with the statement, "I consider the natural environment to be important to my well-being" (question 1h). This is important for participants' discussions of links between the natural environment and health[95] at a variety of scales. The same percentage of participants indicated that they agree with the statement, "I consider the natural environment to be important to children's well-being" (question 1i). This is consistent with the view that the natural environment is important for children's play and

[92] Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.
[93] Considering the nature of the 5-point Likert scale, I have indicated that a certain percentage of participants agreed with a statement when participants answered in the affirmative, that is, indicated that they 'strongly agree' or 'somewhat agree,' when asked to rate their response to a given statement. Similarly, I have indicated that a certain percentage of participants disagreed with a statement when participants indicated that they 'strongly disagree' or 'somewhat disagree,' when asked to rate their response to a given statement. This pools the 'agree' and 'disagree' responses for the purposes of communication.
[94] It would have been useful to include an open-ended question asking participants to explain, in their view, what it means to be 'connected' to the natural environment. While this was not done here, it may well be useful for future research that explores environmental perceptions, and specifically, connectedness to the natural environment and health.
[95] It may be that participants' existing perceptions of environmental health serve to influence their responses to this question, in that participants may be more sensitive to changes in the natural environment if they perceive environmental health to be compromised. Links between environmental quality and health are explored in the following sections.

educational activities. In addition, 38.2% of participants indicated that they agree with the statement, "I have participated in an activity or experience that has made me feel a strong connection with the natural environment in the past 2 years" (question 1j). Perhaps this is not surprising, given the relatively modest percentage of participants who indicated that they feel a sense that they are connected to the natural environment (1a). However, given the high percentage of participants who indicated that they consider the natural environment to be important for their well-being (1h), this relatively low percentage could also be a result of perceptions of environmental quality.[96]

In contrast to the questions which related positively to the natural environment, four statements in this section[97] of the survey related negatively to connectedness with the natural environment, such that agreeing with these statements indicates a relatively low degree of connectedness.[98] Results to individual questions are shown in Table 4.9[99] below:

Table 4.9: Participants' Responses – Relative Disconnection from Nature

Question	Agree (%)	Neutral (%)	Disagree (%)
1c: "I often feel disconnected from the natural environment"	17.9	30.4	51.8
1d: "I often view the natural environment as something threatening"	19.6	19.6	60.7
1f: "I view the human community and the natural environment as separate"	23.2	19.6	57.1
1g: "I feel that my personal well-being is independent of the natural environment around me"	36.4	12.7	50.9

Less than a fifth of participants, 17.9%, indicated that they agree with the statement, "I often feel disconnected from the natural environment" (question 1c). While this may be

[96] Later, during focus group discussions, participants highlighted negative characteristics of the natural environment, at a variety of scales, and indicated that they feel that their personal health is related to environmental health. This may lead participants to spend less time in natural spaces than they would if they held a high perception of environmental health, and could arguably lead to participants feeling a lesser connection to the natural environment. This will be discussed in upcoming sections.

[97] Note that two statements are not included: b and k. While question 1b was originally intended to relate positively to connectedness to the natural environment, it was later decided that this statement could be interpreted in a way as to add to or detract from connectedness to the natural environment, and is therefore not discussed here. Question 1k was originally included along with a related focus group question; however, low participant response to this line of questioning does not allow it to be explored in depth in this research.

[98] These are statements c, d, f, and g. Please consult the survey in Appendix 2 for specific wording of questions.

[99] Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.

considered a relatively low number of participants, it is high enough to be of interest.[100] About a fifth of participants, 19.6%, indicated that they agree with the statement "I often view the natural environment as something threatening" (question 1d). This statement can be interpreted in a variety of ways. It is possible that some participants may view the environment as something threatening, if it is perceived as an external factor, over which they have little control. Furthermore, there may be a perception that large-scale environmental processes are more difficult to control than smaller-scale, local processes. In addition, perceptions of low environmental health may be considered to be threatening. Without additional questioning, it is difficult to determine which aspects of the natural environment may be considered threatening by participants. Nearly a quarter of participants, 23.2%, indicated that they agree with the statement, "I view the human community and the natural environment as separate" (question 1f). This is a relatively small percentage; however, high enough to be of interest. A view that the human community and natural environment are separate may affect participants' views of the links between the natural environment and health, such that participants who hold this view may be less likely to connect their personal health and the health of the natural environment. In addition, this view may also be sensitive to perceptions of environmental quality. In addition, over a third of participants, 36.4%, indicated that they agree with the statement, "I feel that my personal well-being is independent of the natural environment around me" (question 1g). This percentage is surprising, given the high percentage of participants who indicated that they consider the natural environment to be important for their well-being (1h). However, some participants may not view the natural environment as an important influence on their health if they tend to avoid natural areas. As such, it may be that participants modify their use of the natural environment and natural spaces in response to their view of the effects of the natural environment on their personal health and well-being, and, as such, they may consider their personal well-being to be independent of the natural environment.[101]

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[100] It may be that potential participants who feel disconnected from the natural environment would be less likely to participate in this research. However, participation was encouraged from all approached, and it was indicated to participants that there were no 'right' or 'wrong' answers, only valuable individual perspectives.

[101] While human life—and therefore health and well-being—cannot truly be considered to be independent of the natural environment, such that humans require the natural environment to live, it is possible that participants here interpreted 'natural environment' to mean 'natural space' or to refer to a particular natural environment, for example, that of the Mimico Creek area. In this case, it may make sense for participants to view their well-being as apart from the natural environment.

In summary, the section 'Connection to the Natural Environment,' provided participants with an opportunity to indicate their sense of connectedness to the natural environment. While some participants indicated that they generally feel connected to the natural environment, others indicated that they do not. Notably, a large majority of participants indicated that they consider the natural environment to be important for their well-being and that of children. As this was the opening section of the survey, it prompted participants to consider their views toward the natural environment, in general, which participants later explored in focus group discussions.

4.4 The Environment

4.4.1 Introduction

To begin each focus group discussion, participants were asked to discuss their views about the environment, in general. First, participants were asked to discuss their own understanding of 'environment' and what they associate with the term. Discussion then focused on the topic of the environment and health, and participants were asked to discuss their views. Participants noted that the environment may influence health in positive or negative ways, and gave examples of perceived connections between the environment and health.[102] Finally, participants discussed protecting the environment and health, and highlighted the importance of protecting the natural environment in order to protect health.

4.4.2 Defining 'Environment'[103]

When asked how they would define "environment," many participants listed components of the natural environment. Responses across focus groups included 'the air,' 'water,' 'trees,' 'the creeks and rivers,' 'plants,' 'birds and animals,' 'ecosystems,' 'nature,' and other examples of components of the natural environment. One student from the LA12 group combined these influences, indicating that he defines the environment as "[n]ature,

[102] While negative examples outweighed positive examples given by participants, I have often discussed these examples in order from positive to negative, as this is my perception of the general order of the discussions across focus groups. I have tried to be true to the order and context under which comments were made. In addition, I did not wish to place all positive comments following negative comments—despite the generally fewer number of favourable examples—as I do not wish for it to appear that focus group participants paid only secondary attention to positive aspects of the environment and health, as this was not the case.

[103] It is interesting here to note that conceptualization of the environment at such a broad scale allowed participants to use their own implicit conceptions of 'environment' in their definitions of the term.

everything around us… the plants, animals, the ecosystems….” Focus on broad level components of the natural environment is consistent with research that shows that individuals tend to more readily conceptualize the environment at a global scale (see Uzzell, 2000). In addition, participants across focus groups also noted issues associated with the quality of the natural environment, and identified environmental issues such as ‘pollution,’ ‘air quality,’ and ‘acid rain.’ Again, these represent relatively large-scale characteristics or processes. During all focus group sessions, “environment” was commonly defined as ‘outside’ or the ‘surroundings’. A participant from the SM2 group explained that she views the environment as “[t]he place where we live…your outdoor surroundings.” A participant from the MBD group also described the environment as “[t]he area around you—the area in which you live.” A participant from the SM1 group reflected a sentiment popular among participants when she indicated that the environment “[is] everywhere.” A participant from the LINC5 group echoed this point, explaining that the environment is “everything around us.” This participant also explained that he views the environment as independent from humans, although he indicated that he views humans as fully depended upon the environment. He explained that “[i]n the outside environment, everything that does not come from us [is part of the environment]. It doesn’t depend on us.” While the view of the environment as something external was common throughout focus group sessions, participants also highlighted connections between humans and the natural environment.

When asked what they think about when they hear the word “environment,” some participants also focused on environmental interactions and interdependency. One participant from the LA9 group noted that the environment is “where all the non-living and living things interact,” while another from the same group referred to the environment as a “life cycle.” This view of the environment as a life cycle is such that the natural environment provides the stage for various cyclical biological processes associated with life. The natural environment contains various levels of biological organization, linked in the overarching cycle of life. The interdependency of humans and the natural environment—and indeed, any biological organisms and the natural environment—stems from the need of biological organisms for a healthy and suitable environment. In noting our interdependency with the natural environment, participants from the LA9 group pointed out that they consider the built environment to be part of the environment, as a whole. This was unique among the focus

group sessions, as others primarily focused on the natural environment when discussing what they associate with the word, environment.

A participant from the LA12 group went beyond physical components of the environment, and explained that he also associates the environment with our—often non-tangible—sense of connectedness. He explained that the environment is also "[t]he atmosphere. Including, not only the physical [environment], but just the 'mood' of the place, the general impression you gain from standing there." This participant went on to explain that the impressions gained from a particular environment are often dependent upon the perceived quality of the natural environment, that is, upon perceptions of environmental health. A participant from the MBD group also noted that he associates the environment, not only with its physical components, but with "the beauty of nature." Indeed, participants from across focus group sessions expressed their appreciation for the beauty of the natural environment. Participants also highlighted ways in which the natural environment serves to influence their health. Notably, when defining 'environment,' nearly all participants focused on the natural environment rather than, for example, the built or social environment.[104]

4.4.3 Exploring Links Between the Environment and Health

When asked if the environment influences their health, the participants from all groups easily agreed that it does. Yet, while participants from every session agreed that the environment does indeed influence their health, responses varied as to how this occurs, and what role the environment plays in influencing health. Participants indicated that the natural environment can affect human health in both positive and negative ways, and gave examples of these links. Yet, while some participants highlighted the positive effects of natural environments on health, examples of the negative health effects of pollution, such as air and water pollution, dominated focus group discussions. Participants also discussed the relative importance of the environment, compared with other influences on health. When asked in what way the environment influences their health, participants again identified environmental components, and also focused on the interdependency between people and the environment. As one participant from the LINC5 group noted, "We are a part of the

[104] However, when the discussion was subsequently directed to smaller scales, participants also focused on aspects of the social environment and how interactions between the natural and social environment influence environmental quality. This is discussed in the following sections.

environment... If something happens to the environment, it happens to us." In a related example, a participant from the LA9 group indicated that weather patterns can affect human health.

Some participants noted a positive relationship between the environment and health. One implication of this, as many participants from all focus groups mentioned, is that people tend to feel healthier when the environment is perceived to be healthy; and conversely, feel less healthy when the environment is less healthy. Thus, environmental conditions can be considered to be beneficial for health, so long as the environment itself is healthy. A participant from the LA9 group explained that "[the environment] can also have a positive effect. If it's fresh—in fresh environments you get a good effect." Along these lines, a participant from the LINC5 group noted that "[the environment] plays an important role [in] upkeep of the health of the people." This participant noted that this positive effect could be due simply to the "beauty of the environment. The environment is a great thing also." He later added that, "the environment should be considered a source of nature by which we get many benefits, and that it is for health, happiness, for the health of our children… And so, there are a lot of things that we get from the nature…." Thus, it is clear from the focus group discussions, that the positive effects of the natural environment—and especially, good environmental quality—were important to focus group participants. Perhaps because of the perceived close linkages between the health of the natural environment and human health, participants chose to highlight examples of negative influences of the natural environment on human health. These examples, in fact, dominated focus group discussions.

Participants from all groups noted that the natural environment can negatively affect human health, and that effects on human health are generally related to environmental quality. For example, participants highlighted pollution and diseases as negative influences of the environment on health. A participant from the LA11 group reflected this sentiment when she explained that, "[i]f there is too much pollution, it won't be healthy, and you might get sick." A participant from the MBD group also made a direct link to human health in saying that "I'd say you… will be as healthy as your environment." This participant went on to raise the issue of environmental protection, and argued that the environment "[should] be very vigorously protected, otherwise you'll have all types of health deterioration come into

play." Participants also gave examples of the ways in which various types of pollution, for example, air and water pollution, affect people's health.

In particular, participants from most focus group sessions indicated that certain health conditions or diseases could be negatively influenced or exacerbated by low environmental quality or environmental health. Using air pollution as an example, a participant from the LA12 group noted, "if there's a lot of air pollution, especially in the summer, you can't, like, go outside and do the activities you want to do. You're more inside, and less active." A participant from the LINC5 group indirectly touched on this issue when he noted that "[s]moke that comes from factories can affect us," noting that he perceived factory emissions to be a major source of air pollutants. Another participant from the LA12 group noted that air pollution has the potential to affect everyone, explaining that "I think things like air pollution… really affect us individually. As far as if the air is really polluted, you're more likely to get a headache, be in a bad mood, be irritated…." Another participant from the MBD group noted that health conditions, such as asthma[105], can be quite affected by the state of the natural environment and, in particular, by air pollution. He noted that "[a] lot of people are subjected to respiratory distresses from time to time, and the environment can contribute to that, so, right there you might have to stay in… if you have asthma…." This participant explained that asthma can be aggravated by pollutants in the air, which serve to irritate the respiratory tract and, further, that these pollutants may be present at a higher concentration in urban areas. He noted that this may affect people's interaction with and enjoyment of the natural environment, including their choice of where to live. This participant (MBD group) argued that, thus, because of the interdependency between humans and the environment, perceived environmental quality serves to influence people's choices:

> If the environment is unhealthy, chances are, your health is going to reflect that… People… move away from the city, they come into somewhere like Mississauga, where they think the air is better, the pollution is not as bad, and this is quite a factor that determines where you live—how good is the environment.

Furthermore, this participant observed that natural areas may be perceived to be beneficial by those with health conditions, who may seek to live in an area surrounded by nature. Participants also highlighted water pollution as an example of how the natural environment

[105] The example of asthma as a health condition affected by the quality of the natural environment was also given by participants from the SM1 and LA12 groups.

can affect human health. A participant from the LA12 group also discussed water pollution and human health, explaining that, "I'll use water as an example, because we drink out of Lake Ontario, and if that's polluted and there's no way to purify it, then that's a problem." A participant from the SM1 group also mentioned the Walkerton tragedy as an extreme example of how water pollution can affect populations. This points highlights interdependence between both humans and the natural environment, and people with each other.

When probed as to how the environment compares with other influences on their health—such as genetics, access to health services, income, and others—most participants identified the environment as a relatively more important influence, and again identified interdependence as a key reason for the environment's importance to human health, such that, with a healthy environment, people are more likely to be healthy. In discussing our interdependency with the natural environment, one participant from the SM2 group observed, "[w]e are what we eat and what we breathe." Indeed, most participants seemed to implicitly accept that our physical bodies and health are closely dependent upon the state of the natural environment. Furthermore, it is clear from these discussions that many participants relate perceived environmental quality to individual health. As such, protecting the natural environment of the Mimico Creek area is related to protecting health.

4.4.4 Protecting the Environment and Health

Once participants had discussed their definitions of "environment" and the influence of the environment on their health, the relationship between environmental protection and human health was explored in greater detail. Participants were asked if they felt that protecting the environment is related to protecting their health and, overwhelmingly, participants from all groups agreed that, indeed, protecting the environment is related to protecting their health. One participant from the LA9 group made an analogy to the cleanliness of our residential environments: "why are we protecting the environment? [rhetorical]… You clean your house, right? So, you need to clean the environment too—that's your home too." Another participant from the SM1 group explained that one is responsible first for the protection of one's own environment, commenting that "[y]ou have

to start in your own backyard, first."[106] When probed as to how protecting the environment relates to protecting their own health, participants identified the benefits of nature and the natural environment, interdependence between humans and the environment, and the relationship between environmental quality and health as key reasons that protecting the environment is important for protecting health.

Participants from across focus group sessions noted that there exist many physical benefits of nature and the natural environment, and that it is essential to protect the environment to preserve these positive effects. A participant from the LINC5 group noted that the natural environment positively affects physical health because, for example, "[w]e can grow trees that produce oxygen." One participant from the LA12 group pointed out that nature and natural environments can positively influence social health, explaining that "[nature] effects the way you develop socially, because, if you protect the environment, and there's more parks and everything, it gives you more of a chance to socialize. Other than that, if there's not a lot of that, then you're more likely to just stay home." Another participant from the LA12 group illustrated the inherent connection of people to nature and natural environments by saying, "[i]magine waking up and not seeing a tree in front of you…." He added that:

> The creek [itself] is not such a big thing in my eyes, but just to have that greenery around you is definitely a benefit, imagine… to wake up and not see trees, to live downtown, and you know, all you get there is buildings. I think these things influence how you act throughout the day and everything.

He explained that, in his view, this is because the benefits of nature and the natural environment extend beyond benefits to physical health. He explained, "I think if you're more in a natural setting you're more 'at one'," referring to one's holistic connection—spiritual, emotional and physical—with oneself. This participant (LA12 group) also explained that, in his view, emotional and spiritual health can be affected by our connections with nature:

> I think health, is less, like, disease… I think it's more of your mindset, you know? As far as, let's say, your aura goes. Just to specify, I think that's the kind of health that's really affected [by spending time in nature]….

Indeed, many participants highlighted the beauty of nature and the health benefits of healthy natural environments as key reasons to protect the natural environment.

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[106] This likely related to the degree of control that individuals and communities are able to exert over their local environments, as was a previous point of discussion in the SM1 group.

Participants also highlighted people's connection with nature—interdependency—as a key reason for protecting the environment. Indeed, the interdependency between humans and the natural environment means that the quality of the natural environment affects human health. As such, focus group participants indicated that actions taken to preserve the natural environment will be beneficial for health. A participant from the LA9 group explained that people's actions in part determine environmental health: "I think it depends on which way you look at it. Like, if it's a dirty environment, or if it's fresh… It depends on what you do [people's actions towards the environment]." As participants discussed throughout focus group sessions, higher environmental quality generally leads to improved health, while lower environmental quality compromises health. Pollution, in particular, can have a negative effect on human health. As a participant from the LA11 group noted, "if you cut down on pollution, you see your health improve," as human health is so closely linked to the health of the natural environment.

While many participants discussed the environment and environmental protection in general terms, some also related the benefits of nature and the quality of the natural environment to Malton. Participants highlighted the need to protect the health of the Mimico Creek natural environment. As one participant from the SM2 group noted, "if there was some kind of pollution in the water, [considering] how it affects [the animals], it might actually affect us also." However, one participant from the LA12 group argued that, while there may exist perceived problems with the health of the Mimico Creek, the benefits to Malton of natural environment of the creek cannot be overlooked. Links between the Mimico Creek and health in Malton are discussed in upcoming sections.

4.4.5 Summary

The general discussion of the environment during focus group sessions produced a variety of responses. Nonetheless, some key themes emerged which relate the natural environment to health. In this section, participants referred to the environment at a broad scale, often citing conceptual links between the environment and health. In particular, many examples given by participants focused on general components of the environment, which can be conceptualized at broad scale. However, only a few particular examples were provided by participants in order to contextualize links between the environment and health

at this scale. Participants often discussed the link between environmental health and human health as an interdependence, such that there is a positive (directional) relationship between perceived environmental quality and health—that is, perceived *improvements* in environmental health are related to perceived *improvements* in human health. Participants indicated that links between the natural environment and health can operate on an individual level, such that health can be affected by environmental conditions. However, the majority of actual examples provided by participants of the relationship between the environment and health were negative, reflecting a generally negative view of both environmental health and the influence of the environment on human health, at this scale. In particular, participants highlighted negative examples of environmental conditions, such as pollution, which can cause related negative health effects, such as disease. Thus, it can be seen that negative examples, while general, emerged at a broad scale.

Following discussion of the environment and health at a broad scale, participants focused on links between the environment and health at the neighbourhood scale. These connections are explored in the following section.

4.5 The Neighbourhood Environment

4.5.1 Introduction

After discussing broad perspectives on the environment and health, focus group participants were asked for their thoughts on how neighbourhood-level environments influence health. Firstly, participants were asked general questions in order to conceptualize neighbourhoods and health and to explore health at the neighbourhood level. Secondly, participants were asked to discuss links between their own neighbourhood environment and personal health. Participants discussed links between the environment and health at the neighbourhood level, and highlighted both positive and negative aspects of their own neighbourhood that they feel influence their health.

4.5.2 Exploring Links Between Neighbourhood Environments and Health

Participants were asked whether neighbourhoods can be considered healthy and, overwhelmingly, participants from all groups responded that neighbourhoods can indeed be

considered healthy. When asked what makes a neighbourhood healthy, participants focused on characteristics of the natural environment, and characteristics of the social environment, as they relate to health. As one participant from the LA12 group noted:

> a neighbourhood has many facets. You have to explore residents, the housing, the environment as far as trees, and so on, even things like shopping centres. With all these components you can probably rate them on individual scales, to get an overall assessment of the neighbourhood.

When asked what shapes the health of a neighbourhood, participants often highlighted links between the natural environment and health. In exploring links between the natural environment and health, participants discussed what makes a neighbourhood healthy, and highlighted cleanliness of the neighbourhood environment, enforcement of environmental laws, and environmental awareness among residents as essential characteristics of a healthy neighbourhood. These are discussed, in turn.

Participants from all groups responded that the health or cleanliness of the natural environment in a neighbourhood is essential for neighbourhood health. One participant from the SM2 group noted that "they [a healthy environment and a healthy neighbourhood] go hand in hand." This sentiment was reflected across focus group sessions. Some participants highlighted examples of ways in which healthy neighbourhood environments produce healthy neighbourhoods. One participant from the LINC5 session indicated that neighbourhood cleanliness and health are closely related, as "[i]t's the hygienic conditions that prevail in the neighbourhood that become just a source for our good health." This participant indicated that the cleanliness of a neighbourhood is partially dependent on effective waste removal, as well as beautification efforts. Thus, these are closely related to the health of a neighbourhood by producing clean neighbourhood conditions. On the other hand, as a participant from the LA11 group explained, "if [the environment is] dirty, then it could make you sick." This view was also shared by participants across focus group sessions. A participant from the LA12 group spoke specifically about Malton's environment, and noted that "because of our [Malton's] surroundings, the litter, the pollution, the air pollution, the creek, the water around us, if it's all dirty, then obviously it's not healthy, and it's not healthy for the rest of us."[107] Participants also took an active approach to the question

[107] This example, specific to Malton, was commonly made across focus group sessions. While the discussion explored whether neighbourhoods can be considered healthy and what—in theory—shapes the health of neighbourhoods, many

of what shapes the health of a neighbourhood, pointing out that efforts to improve the natural environment in a neighbourhood can positively affect health. Again, participants highlighted cleanup efforts and litter reduction as necessary for improving the health of the natural environment in a neighbourhood. For example, a participant from the SM1 group indicated that "cleaning up the creeks and planting more trees" would help improve the health of a neighbourhood. As well, a participant from the LA11 group noted that "[j]ust in terms of everybody littering… people should put things in the garbage." Indeed, the focus on litter reduction for improving the health of a neighbourhood was highlighted across focus group sessions.

Participants from across focus group sessions also agreed that good upkeep and cleanliness of a neighbourhood is an indicator of a healthy neighbourhood. Participants from the LA11 group argued that a "[keeping] it [a neighbourhood] clean" is both a condition for a healthy neighbourhood, and an indicator that it is healthy. A participant from the LA12 group noted that "if you go somewhere and you see that all the lawns are groomed, and everything's clean cut, there's flowers in it, it's going to give you a sense that it's [the neighbourhood] healthy." Participants from the LA11 group also indicated that a healthy natural environment contributes positively to the health of a neighbourhood, and that "lots of trees" present in the neighbourhood is a marker of a relatively healthy neighbourhood. A participant from the MBD group noted that "general awareness of upkeep, and good looks [are important]" for a healthy neighbourhood. This participant added that the presence of these characteristics in a neighbourhood is an important factor in encouraging other people to move into a particular neighbourhood. Indeed, as this participant suggested, people may be more inclined to take up residence in a neighbourhood that they perceive to have a healthy natural environment.

Other participants argued that enforcement of environmental and litter by-laws are important for preserving environmental health. As one participant from the SM2 group observed, "[t]here's all these by-laws, but none of them are enforced… So, what's the point of people sitting down and creating all these by-laws, if nobody ever enforces them? I think once in a while, they should be enforced, or at least, people should be reminded of them."

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participants naturally took this opportunity to give specific examples related to Malton. Some of these examples have been listed here, to be true to participants' responses, and for the sake of discussion. However, specific links between the environment and health in Malton will be discussed in detail in the following section.

Participants from across groups identified enforcement of litter laws as a factor that helps to promote cleanliness, and contributes to a healthy natural environment in a neighbourhood.

In addition, participants across focus group sessions also related environmental awareness and individual responsibility for the environment to neighbourhood health. Participants noted that the health of the natural environment in a neighbourhood is closely related to the awareness of individuals living in the neighbourhood. A participant from the MBD group noted, "[p]eople's awareness is so important," in shaping the health of a neighbourhood. A participant from the SM2 group highlighted the importance of individual responsibility for the environment, explaining that, "when you're talking about a neighbourhood, I guess you're talking about each individual… to clean up after themselves." This participant highlighted the importance of individual awareness and participation in environmental clean up efforts. In addition, participants from the SM2 group highlighted the importance of environmental education in increasing people's awareness of the environment and health at the neighbourhood level.

In addition to identifying the natural environment as important for neighbourhood health, many participants described links between the social environment and the health of a neighbourhood. In exploring links between the social environment and health participants discussed characteristics of the social environment that are relevant for health. Participants highlighted social involvement and social interaction as characteristics of the social environment that shape the health of a neighbourhood environment. Participants also gave examples of indicators of a healthy neighbourhood that relate to the social environment, for example, socioeconomic conditions in the neighbourhood.

Participants from across groups highlighted the importance of people and people's attitudes in shaping the health of a neighbourhood. When asked what shapes the health of a neighbourhood, a participant from the LINC5 group responded that "[m]ainly, [it] is people, because if the people are healthy, then everything is healthy, I think so." This point was also made by participants from the SM1, LA9 and MBD groups. A participant from the LA11 group simply noted, "[p]eople… How we treat each other—that's what I think," while a participant from the LA12 group responded that "positive attitudes" are essential for promoting neighbourhood health.

Participants from a variety of groups responded that social interaction in a neighbourhood benefits neighbourhood health by creating a healthier social environment. A participant from the LA12 group highlighted a connection between the health of a neighbourhood and levels of social interaction. This participant observed:

> In most neighbourhoods, if it's considered to be more healthy, then you see a lot of socializing going on, you see more children coming out to play, you see adults going out to talk to each other, even when they don't know each other. But if it's considered to be not healthy, then everyone would just be locked up in their house, and not talk to anyone. So it's more social in healthy places.

Indeed, greater levels of social interaction among neighbourhood residents may indicate higher levels of community social involvement in the neighbourhood, and may also reflect an interaction of other neighbourhood characteristics important for health at the neighbourhood level. However, it is the quality of social interaction, as well as its level, which contributes to neighbourhood health.

As a few participants from the LA9 group observed, negative peer pressure, such as smoking and drug use, can detract from the positive effects of neighbourhood social interaction. Indeed, the quality of social interaction in a neighbourhood can depend on additional social factors, for example, neighbourhood socioeconomic status. Indeed, a participant from the LA12 group linked conditions of the natural environment and socioeconomic conditions to socialization and neighbourhood health. This participant argued that:

> If you go to a place that's filled with more poverty, compared to others, and the income's lower, likely the resources aren't going to be there… Like, for example, some places in Mississauga that they just fixed up and built, you can go there and it's clean… it looks healthy, it looks clean, it looks recreational, they make room for more socialization. Some places, that are… run down, no one wants to go there, [they tend] to be more dirty looking… doesn't look as healthy as the other neighbourhoods.

This participant indicated that the social environment of a neighbourhood may be an indicator of a neighbourhood's overall health. Indeed, many environmental factors interact to shape the health of a neighbourhood and, as participants observed, these characteristics are often perceived as indicators of the health of a neighbourhood.

Participants provided examples of indicators of a healthy neighbourhood that relate to a neighbourhood's social environment. One participant from the LA12 group made

reference to the visual appearance of a neighbourhood's built environment as a sign of social health in a neighbourhood. This participant observed that:

> If you go into a certain neighbourhood and you see, just from the visual effects, that it's unhealthy, but if you look you see graffiti all over the place and you see it's dirty and everything's run down, you're not going to think of it as a healthy place.

In a related example, another participant from the LA12 group noted that:

> There's always many components, like crime, and the attitudes of the people [that relate to the health of a neighbourhood.] In some places you can go, you can compliment a stranger and say 'hi', and some places you can do that, and you'll just get a nasty look back. So, all these things add up to assess a neighbourhood.

Thus, participants noted that there are many signs of a healthy neighbourhood social environment, some perhaps subtle, which people observe when present in a particular neighbourhood environment. Indeed, these social characteristics are also related to characteristics of the natural environment that interact to shape the health of a neighbourhood. In their own community of Malton, participants highlighted characteristics of both the natural and social environments that serve to influence health at the neighbourhood level.

4.5.3 The Neighbourhood Environment and Health in Malton[108]

When asked whether they think that the environment in their neighbourhood influences their personal health, participants from all groups indicated that, indeed, they do consider the environment in their neighbourhood to influence their health. Many participants discussed the environment and health in Malton as a whole, indicating that they view Malton as a neighbourhood unto itself.[109] When asked in what way they think the environment in their neighbourhood influences their health, participants highlighted positive and negative

[108] While section 4.6 discusses the environment and health in Malton with a particular emphasis on the Mimico Creek environment and health, this section discusses the environment and health in Malton generally, at the neighbourhood level. During focus group sessions, discussion was divided into three broad themes—environment, neighbourhood and Mimico Creek—and this section is presented here to preserve this order in presentation of results.

[109] Throughout focus group discussions, participants unanimously indicated that they consider Malton to be a neighbourhood in itself; that is, they consider Malton to be one neighbourhood rather than a collection of a number of smaller neighbourhoods. This is relevant for discussions of the environment and health in Malton at the neighbourhood level, as it shows that participants view Malton as a community and as a neighbourhood. This finding is relevant to exploring links between the environment and health in Malton, especially with regard to the environmental health of the Mimico Creek and Malton's social identity. This will be discussed in greater detail in section 4.6.5.

characteristics of the natural and social environments in Malton, and related these characteristics to health.

Some participants highlighted positive aspects of the natural environment in Malton, noting that a cleaner environment promotes good health. Participants noted that having a cleaner neighbourhood produces healthier conditions for residents. A participant from the MBD group listed positive characteristics of Malton's environment, noting that "[w]e have trees, and… better air to breathe; [because] it [trees] affect the air… [And] good running water." He explained that "if you have an environment with lots of trees… you have an enriched oxygen environment… Plus, the running water and other things are good for you, so, all of those things are good things, positive things for the environment." However, while some participants noted that positive aspects of the natural environment serve to enhance the health of Malton, as a neighbourhood environment, many more participants focused upon negative aspects of the environment.

In particular, some participants listed components of the natural environment in Malton which they consider to be health-compromising. Overall, participants from across focus group sessions indicated that "pollution" is a problem for health in Malton. One participant from the LA12 group simply stated that "Malton's depressing," referring to high perceived levels of pollution—a sentiment that seemed to be shared by some other participants across groups. One participant from the LA12 group made a connection between an unhealthy natural environment and health, noting that "[i]t [experiencing pollution in one's neighbourhood] creates stress. Stress is unhealthy…." Another participant from the LA12 group commented that "[w]ell, if you look at how everything is [in Malton]… If I haven't seen anything really nice, and clean, then it kind of brings my mood down." In addition to pollution, participants from the SM2 group highlighted the presence of particular species as an indicator of low environmental health. These participants explained that they consider the presence of "rats" and "pigeons" in Malton to be health-negating. Thus, participants indicated that the environment in Malton has both health-enhancing and health-compromising effects, as related to the health of the natural environment. However, participants also identified the social environment in Malton as important for health.

Participants made connections between negative aspects of the social environment and reputation of Malton, and health. While one participant from the LA9 group noted that

Malton's social environment is favourable, in the sense that it offers the opportunity for social interaction, an overwhelming majority of participants discussed negative aspects of the social environment. For example, a participant from the LA12 group linked low social involvement to neighbourhood health in Malton. He explained his perception of low social involvement in Malton as follows:

> in Malton, I think the people are more reserved or withdrawn, or aloof, generally. So sometimes, you'll see people who don't leave their house often, they'll leave their house to make grocery and come back home. Like, the concept of… a picnic, in Malton… is atrocious… People don't picnic, generally. So to our [sociocultural] communities, individually… I think sometimes we just overlook these things. We're more money-, career-oriented. Just make your money, make your grocery and come home and live.

This participant explained that, in his view, low social involvement detracts from neighbourhood health. Furthermore, he argued that relatively low use of natural spaces in Malton, such as the Mimico Creek, for social activities, such as picnics, is partly due to a career-oriented mentality among residents. This reasoning demonstrates a perceived link between the social and natural environments and neighbourhood health in Malton. However, it may be that since Malton is a generally lower-income community, its residents may have relatively less leisure time to devote to social involvement, or to activities such as enjoyment of the natural environment, which this participant highlighted as indicators of a healthy neighbourhood.

In addition, participants related environmental issues to social health in Malton, as well as perceived characteristics of its social fabric. For example, the presence of garbage was often discussed as an indicator of social problems. For example, as one participant from the SM2 group noted, "[i]t depresses me that people are not interested in the area they live in." Another participant from this group agreed that, "people don't take initiative to clean up after themselves." Along these lines, some participants also highlighted vandalism as a key environment and health concern. One participant noted that:

> [it] bothers me… where they've broken a tree, you know, you have trees planted along the boulevard… Well, maybe one time, it's an accident or something, but when it's vandalism or something, it depresses me… I don't want to say it increases crime, but I mean if the whole neighbourhood goes into a slum…Well, I associate that with crime, anyway.

This participant noted that such neighbourhood vandalism has a consequent negative effect upon her personal health. Furthermore, some participants from the SM2 group discussed Malton's reputation and its social fabric, highlighting its relatively low-income status, in relation to health. These participants argued that the presence of low-income residents has a negative effect on health in the neighbourhood. One participant from the SM2 group expressly argued that, "if you have the lower income in an area, they dirty your environment. They don't care." He further illustrated his point by saying that "you [directed to moderator] go walk around a neighbourhood that's half a million dollar houses, and then you go around these big, high-tower, low class apartments, and see the difference in your environment." Another participant from this group agreed with this assessment, explaining that this view is true because "if too much is given to you, you don't have that same respect for it." When asked how this influences their personal health, these participants indicated that they believe that it affects their personal health, yet were unable to give a specific example to illustrate this. Connections between Malton's social identity and health are discussed further in section 4.6.5.

4.5.4 Summary

Participants related the health of a neighbourhood to characteristics of the natural and social environments. Participants indicated that they consider neighbourhoods to have the potential for health; that is, that it makes sense to discuss health at this level. In particular, participants noted that healthy features of the natural environment make for a healthy neighbourhood; while a healthy neighbourhood environment contributes to a healthy neighbourhood social environment. Participants' focus on the social environment at the neighbourhood level was an interesting finding, given that participants focused exclusively on the natural environment at a broader scale. Participants also discussed the neighbourhood environment and health in Malton; however, negative examples were again most prominent. Thus, at this scale, participants were able to give more specific examples of characteristics of both the natural and social environments, when examining the environment and health, than they were able to when considering a broader scale.

After discussing the environment and health at the neighbourhood scale, participants focused on the Mimico Creek environment and health at the local level. This is discussed in the next section.

4.6 The Mimico Creek Environment

4.6.1 Introduction

After discussing the natural environment and health, first broadly, and then at the neighbourhood level, participants then focused on the environment and health in Malton, with a focus on the Mimico Creek. Firstly, participants were asked questions to contextualize the Mimico Creek as a neighbourhood feature in Malton. Secondly, participants were asked to discuss the Mimico Creek environment and health, both at the individual and neighbourhood levels. Participants identified links between the environmental health of the Mimico Creek, their personal health, and the health of their neighbourhood. Results from surveys and focus groups related to the Mimico Creek and health are presented in the following sections.

4.6.2 Mimico Creek as a Neighbourhood Feature

4.6.2.1 Importance and Awareness of the Mimico Creek

The importance of Mimico Creek as a neighbourhood feature was explored on the survey, and in focus group discussions. To contextualize the Mimico Creek as a neighbourhood feature, participants were asked whether they consider the Mimico Creek to be part of their neighbourhood, to begin the second section of the survey. Most participants indicated that they do, indeed, consider the Mimico Creek to be a part of their neighbourhood. Nearly three quarters, 72.7%, agreed that they consider the Mimico Creek to be part of their neighbourhood, while 10.9% disagreed and 16.4% were undecided. This is relevant for discussion of the Mimico Creek as a neighbourhood feature in Malton. It may be that participants who feel a connection to the Mimico Creek, in particular, are more likely to consider it an important neighbourhood feature. In addition, environmental perceptions of the Mimico Creek may influence participants' views of the importance of the Mimico Creek as a neighbourhood feature, and may, in turn, influence whether they consider the Mimico

Creek to be part of their neighbourhood. In particular, proximity to natural environments has been shown to play a role in shaping environmental perceptions (Brody et al., 2004).[110] For example, in a study of perceptions of particular creek environments in the U.S., Brody et al. (2004) show that awareness of a neighbourhood creek is partly a function of residential proximity and length of residence, such that residents who live closer to the creek, and those who have resided by the creek for longer periods of time, are more likely to be aware of its presence. Thus, it may be that participants who are more aware of the Mimico Creek are also more likely to consider it to be a part of their neighbourhood. Yet, while this survey question set the stage for establishing the Mimico Creek as a neighbourhood feature, the importance of the Mimico Creek as a neighbourhood feature was explored in depth during focus group discussions.

When asked whether they consider the Mimico Creek to be an important feature of their neighbourhood, participants from all focus groups responded affirmatively. When participants were asked to discuss why they view Mimico Creek as an important neighbourhood feature, some highlighted the positive effects of the natural environment and positive uses of the Mimico Creek area. However, many also mentioned a number of negative characteristics that affect their view of the importance of the Mimico Creek area, such as compromised environmental health and pollution, and safety issues. Participants from all groups noted that their perceptions of the environmental health of the Mimico Creek area influence their assessment of the creek's importance. When asked about the creek's importance in their neighbourhood, participants also highlighted awareness of the creek as a key issue that affects residents' assessment of its importance as a neighbourhood feature. Participants took this opportunity to discuss the importance of awareness of the creek area as part of the natural environment in Malton.

Many participants highlighted positive aspects of the Mimico Creek area that make it an important neighbourhood feature. Participants from across groups indicated the importance of the natural environment of the Mimico Creek area, and highlighted the contrast between this natural environment and the surrounding urban, suburban and industrial areas. A participant from the LA9 group explained that the Mimico Creek is

[110] Brody et al. (2004) note that proximity influences both environmental perceptions and the accuracy of information concerning the natural environment. However, it is not the goal of this research to judge the accuracy of participants' perceptions of the natural environment, merely to explore these perceptions in relation to health; as such, the topic of accuracy is beyond the scope of this research.

important, simply because "it's not just an urban area." A participant from the LINC5 group explained, "I think this [the Mimico Creek] is important—very important." He highlighted the importance of greenspace areas like the Mimico Creek, in a developed area like Southern Ontario, and explained that:

> in this neighbourhood… in Ontario, we don't have enough greenspace. We are surrounded by buildings and concrete. We need to keep in touch with the parks and green areas, because we need this. We come from naturalness, from green areas, so we need to remember where are we from.

It is clear from focus group discussions that the Mimico Creek is valued by participants for the greenspace it provides. In fact, many participants agreed that the Mimico Creek is especially important for Malton, as Malton has few—if any—other sources of nature nearby. A participant from the LA12 group described the creek as a main natural space in Malton: "[the creek is] our only source of nature, really, 'cause if you see how on one side of the creek it's all buildings and stuff." Participants also explained that this natural space is important for wildlife habitat and, as such, needs to be protected. A participant from the MBD group explained that, "natural habitat, I think it's important. And the only concern is the preservation of that, while we preserve that." Participants noted that, while the creek may not be perceived as important by all residents of Malton, it is invariably important for wildlife in Malton. As one participant from the LA11 group commented "it's not really important to me [personally]… but if you look at it… there are animals out there." This participant explained that, while she herself does not make use of the creek area, she nonetheless acknowledges it as an important natural environment and essential habitat for area wildlife. On a personal level, a participant from the SM2 group described the positive effects of living next to the creek and seeing its wildlife: "[t]he creek is right behind our house, and we get lots of birds—it's beautiful." The beauty of the Mimico Creek's natural environment is something that was highlighted by participants across groups as a valuable part of Malton. In addition, participants noted that the beauty of the creek area allows for increased recreational and casual use by residents. As one participant from the LINC5 group observed, "[the Mimico Creek] is very important for… recreation… [in] the neighbourhood." Indeed, the importance of the Mimico Creek is linked to its uses, as described by participants; however, importance of the creek, like assessments of its use, is closely related to perceived environmental health. However, participants also identified the

environment of the creek as an area of environmental concern, and highlighted aspects which detract from their view of the creek's importance in Malton. [111]

Participants from all focus group sessions indicated that litter and pollution in the creek reduce the environmental health of the creek and serve to compromise its importance in Malton. In addition, participants noted a lack of wildlife in the creek as a sign of low environmental health. A participant from the SM2 group commented that, "if gets to a point where you could stock it with fish, then it would be an important feature." However, this participant argued that current levels of pollution make the creek unable to support larger fish stocks. Other participants highlighted the low environmental health of the Mimico Creek as something which reduces the creek's importance as a neighbourhood feature. In particular, participants highlighted the presence of litter and trash in the creek as features which detract from the creek's importance, either directly or indirectly. A participant from the LA12 group noted that, "if you look… it's really polluted. I just think people should take it and clean it up a little, just for the sake of people who go there." Another participant from the LA12 group noted that, although many residents walk by on a daily basis, it might be difficult to know how to improve the situation: "at lunch, most of us pass it, pass over the bridge. You acknowledge, 'oh my God, it's dirty,' but no one does anything." A participant from the SM2 group explained:

> I walk through there quite often and it's really beautiful, but again, it's the garbage that's really irritating. I don't really like to go for long walks through Malton, because it just makes me mad with [how] everybody just throws their garbage around….

However, some participants did discuss their involvement in clean-up efforts. A participant from the SM1 group noted that "we [St. Mark's Church environment group] did a clean up with the youths several years ago. And we ended up taking out, like, nineteen bags of garbage, just from behind the [Malton Community Centre] here, down to the bridge." However, while participants indicated that negative aspects of the Mimico Creek environment detract from its importance as a neighbourhood feature, it could be argued that

[111] Of course, in this case, it could be argued that the Mimico Creek is important in Malton, but in a negative way. It should be emphasized, however, that all participants seemed to interpret 'importance' in a positive or beneficial way, such that things which detract from the positive influence of the creek, for example, pollution, also serve to lessen its perceived importance as a neighbourhood feature. I chose not to raise this point during focus group sessions, as I did not wish to be intrusive.

clean up efforts actually serve to enhance the importance of the creek as a neighbourhood feature, by promoting awareness and improving the natural environment of the creek.

Participants indicated that the issues of awareness and environmental improvement are also related to the importance of the Mimico Creek as a neighbourhood feature. Some participants noted that whether or not Malton residents consider the Mimico Creek to be an important feature of their neighbourhood depends primarily on awareness of the creek environment, rather than on characteristics of the environment itself. While some participants felt that, to quote a participant from the LA12 group, "[e]veryone knows about the creek," others felt that the creek is not well known in the area, especially to newcomers to Malton. A participant from the SM1 group commented that, "I think a lot of people don't even know that it exists, that's the problem." He explained further, "a lot of people don't know its importance… Because we've got people coming from a lot of other countries, when, maybe to them, they've never seen something like this before." Participants from the SM1 group highlighted the importance of environmental awareness of the Mimico Creek as part of a larger system of watersheds, as well as of the role of watersheds in the natural environment as a whole. As one SM1 participant pointed out, "[t]here may be a recognition… of the Mimico Creek, but not that it's part of a whole watershed." Participants from this group also noted that, in Malton, the Mimico Creek is surrounded by a greenbelt system, which supports the natural environment of the area and provides a green corridor for wildlife. Yet, participants from this group again highlighted the importance of awareness of the creek environment. One participant noted, rhetorically, "how many people know what a greenbelt even is?" The SM1 group consistently highlighted the importance of environmental education and awareness of the creek environment, and some members from this group were involved in environmental stewardship and creek clean-up efforts with their church group. However, some participants from across groups admitted to being less connected to the creek on a personal level. As one participant from the LA12 group admitted, "I've lived in Malton for five years now, and I've never actually taken time to say, 'you know what, I'm going to go look at the creek', or spend time around the creek." As one participant from the SM2 group observed, "I haven't seen any families out there having a picnic beside the Mimico Creek area." Yet, perhaps—as many participants discussed—more

Malton residents would frequent the Mimico Creek area if it were perceived to be of higher environmental quality, or a more health-promoting environment.

In summary, while most participants considered the Mimico Creek to be part of their neighbourhood, participants' perceptions of the environmental health of the Mimico Creek served to influence their perception of its importance as a neighbourhood feature in Malton. Several participants, from a variety of focus groups, noted that they would consider the Mimico Creek to be a more important feature of their neighbourhood if they perceived the creek to be cleaner and, furthermore, that their view of the creek as an area of low environmental health negatively affects their use of the creek environment.

4.6.2.2 Use of the Mimico Creek

While many participants considered the Mimico Creek to be an important feature of their neighbourhood, use of the creek by participants varied by activity and perceptions of environmental health. Thus, outlining participants' use of the creek may contribute to exploring links between the Mimico Creek environment and health. On the survey, participants were asked whether they consider the Mimico Creek, in general, to be a healthy environment for specific activities. Participants' responses are listed in Table 4.10[112] below:

Table 4.10: Mimico Creek as a Healthy Environment for Selected Activities

Activity	Agree (%)	Neutral (%)	Disagree (%)
Walking	62.3	13.2	24.5
Walking pets	56.6	15.1	28.3
Children's play activities	30.2	7.5	62.3
Picnics	20.8	17.0	62.3
Other leisure activities	28.8	30.8	40.4

While a small majority of participants indicated that they consider the Mimico Creek to be a generally healthy environment for walking, and walking pets—62.3% and 56.6%, respectively—less than a third, 30.2%, indicated that they consider the creek to be a healthy environment for children's play activities. It is likely that perceptions of environmental health of the Mimico Creek area are relevant to participants' perceptions of the Mimico Creek as a healthy environment for these uses. Indeed, even fewer participants, only a

[112] Note that participants who responded 'strongly agree' or 'somewhat agree' are pooled under 'agree'; participants who disagreed are pooled similarly. Participants who responded 'neutral' were not pooled. Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.

fifth—20.8%—indicated that they consider the Mimico Creek to be a healthy environment for picnics. Since picnics are often a family activity and further, since they involve the consumption of food, participants may be unwilling to use the Mimico Creek environment for this activity if they view it to be an area of low environmental health. Thus, while the survey demonstrates participants' perceptions of the suitability of the Mimico Creek for these selected activities, focus group discussions served to shed light on participants' perceptions.

During focus group discussions, participants outlined their use of the Mimico Creek environment, and gave examples related to types of use. When asked whether they use the Mimico Creek or the surrounding greenspace area, many participants replied that they do use the creek; however, some indicated that they do not use it, and explained reasons for their avoidance. Participants who indicated that they use the Mimico Creek explained that most of this use is casual. Examples given by participants included walking, jogging, biking, walking pets, use as a meeting place (for students), and simply admiring the beauty of the natural environment. However, participants' responses varied noticeably by age. While older participants tended to use the creek primarily for walking, relaxation and nature appreciation, younger participants tended to make use of the creek for biking and walking pets, nature appreciation, and also tended to make use of the greenway as a meeting place and a passageway through Malton. Participants from groups conducted at Lincoln Alexander Secondary School noted that they often walk by the creek, and use its greenways as a shortcut to school and Westwood Mall through areas of Malton. Noting the proximity of the school to the Mimico Creek (refer to aerial photo in section 2.3.4), this use is to be expected. While casual use was the foremost type of use by focus group participants, participants made it clear that they value the Mimico Creek area as a part of the natural environment in Malton. A participant from the LA12 group noted that, in terms of the natural environment, Mimico Creek is "all we have…." This sentiment was echoed by a number of focus group participants, who indicated that they enjoyed the opportunity to take advantage of the Mimico Creek area natural environment, in spite of the frequency with which they utilized the creek environment.

While many participants indicated that they make use of the Mimico Creek area, others noted that they do not use the creek area. In fact, some participants from each group

indicated that they do not use the creek, and provided a few key reasons. Common responses included not living near the creek, limited recreational opportunities, low environmental health and safety concerns. These reasons are understandable, given the size of Malton, and the shape of its parks and greenway system. While the Mimico Creek runs through Malton, the community is sufficiently large that many residents do not live directly by the creek, which may make using the creek area an inconvenience. Also, while Wildwood Park offers recreational opportunities, some of the Mimico Creek's smaller greenspace areas in Malton serve as greenways, rather than as parks. These greenways also function as corridors for wildlife and are much less accessible than parks, often without paved paths, which may limit their utilization by Malton residents. Poor perceived environmental health of the Mimico Creek was also cited as a reason why users of the creek area do not use it more often. Thus, use of the Mimico Creek is related to its perceived environmental health, such that low environmental health is related to avoidance, and a decline in use of the creek by Malton residents. Among participants who stated that they do not use the creek due its poor environmental health, many noted that if they considered the Mimico Creek to be a healthy environment, they would be more inclined to use it. Even among participants who regularly used the Mimico Creek, there was a recognition that perceived environmental health of the Mimico Creek area is related to both their own use and that of other Malton residents. As a participant from the SM2 group, who used the creek, commented that, "I'm sure if it's attractive enough, we would all go there." This sentiment was echoed by many participants who used the Mimico Creek area, while low perceived environmental health and attractiveness was also identified as a reason for avoidance among participants who chose not to use the creek. As many participants have related the environmental health of the Mimico Creek area to their own health, it is possible that avoidance of the creek for reasons of low perceived environmental health is related to concerns for health. Participants clearly noted that they directly attribute this less frequent use of the Mimico Creek area environment to the poor perceived environmental health of the area, and that this, in turn, affects their view of the creek as an important neighbourhood feature.

While many participants highlighted aspects of the natural environment which affect their use of the Mimico Creek, some highlighted social issues which detract from their use of the environment. For example, some participants identified the issue of personal safety as

relevant to their use of the creek. One participant from the SM2 group explained that she does not use the creek because "I don't feel safe… I've been approached several times walking in Malton on the streets… I would never [walk alone in Malton]… and especially not the banks of that Mimico Creek." This participant explained that she views the creek as a socially isolated environment, in which there may be no one to help her if she required assistance. She explained further that "I've heard [about] drug dealers… It doesn't seem to be a safe environment. I would never even consider walking up there." A participant from the LA12 group also commented on the social environment of the creek and explained that, "because it's secluded, a lot of people abuse the creek area to do things that they probably shouldn't be doing." This participant also referred to drug use in the creek area by young residents. Notably, this view was also expressed by participants in the LA9 and LA11 groups.[113] As such, the issue of personal safety was highlighted by participants as an important factor contributing to their use of the Mimico Creek.

Thus, it is clear from focus group discussions that the perceived health of the natural and social environments of the Mimico Creek are related to participants' use of the creek environment. These, in turn, are related to participants' perceptions of the overall environmental health of the creek. Links between the Mimico Creek environment and health are discussed in the following sections.

4.6.3 Exploring Links Between the Mimico Creek Environment and Health

4.6.3.1 Environmental Health of the Mimico Creek

Participants related the importance and use of the Mimico Creek as a neighbourhood feature to its environmental health. Participants' perceptions of the environmental health of the Mimico Creek were explored on the survey and during focus group discussions. On the survey, participants were asked how important they consider the Mimico Creek to be for protecting human health and that of other species and biological communities. Participants' responses are listed in Table 4.11[114] below:

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[113] Thus, the issue of drug use in the Mimico Creek area was expressed by participants from all three focus group sessions at Lincoln Alexander Secondary School. It may certainly be, in terms of the social environment, that students of this age experience greater social risk in this environment than would adults. However, it is beyond the scope of this project to test this explicitly.

[114] Note that participants who responded 'very important' or 'somewhat important' are pooled under 'important'; participants who disagreed are pooled similarly. Participants who responded 'neutral' were not pooled. Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.

Table 4.11: Importance of Mimico Creek for Health

Activity	Important (%)	Neutral (%)	Not Important (%)
Protecting human health	78.6	16.1	5.4
Health of other species	76.8	19.6	3.6
Health of biological communities or ecosystems	76.4	16.4	7.3

A majority of participants, 78.6%, indicated that they consider the environmental health of the Mimico Creek to be important for protecting human health. Since the Mimico Creek forms a large part of Malton's natural environment, this result is consistent with participants' indications that, in general, the natural environment is important for their health and well-being, and that of children. As such, high environmental health of the creek may enhance human health, whereas low environmental health may have a negative effect on health. In addition, about three quarters of participants, 76.8%, indicated that they consider the environmental health of the Mimico Creek to be important for the health of other species, such as wildlife living in the creek area, and 76.4% indicated that they consider the environmental health of the Mimico Creek to be important for the health of biological communities or ecosystems. This can be seen to relate to neighbourhood health if participants view the natural environment, as well as area wildlife, as part of their neighbourhood. While these results indicate that participants consider the environmental health of the Mimico Creek to be important, participants were able to discuss their perceptions of the environmental health of the Mimico Creek during focus group discussions.

Throughout focus group sessions, participants discussed the environmental health of the Mimico Creek area, and related its environmental health to their own health and that of their neighbourhood.[115] While some positive examples emerged of the benefits of the Mimico Creek to individuals and the neighbourhood in Malton, nearly no positive examples were given to describe the current state of the Mimico Creek environment. Indeed, when discussing the environmental health of the Mimico Creek, participants often described the environmental health of the Mimico Creek in a negative way, and pointed to examples of the presence of litter, trash and pollution in the creek. This is interesting, in light of the issue of

[115] Links between environmental health of the Mimico Creek and health at the individual and neighbourhood levels are discussed in upcoming sections.

scale. It is possible that participants' focus on negative examples of environmental health of the Mimico Creek stem from their familiarity with the creek at this scale, vis-à-vis their familiarity with other environments at different scales. As such, the issue of scale may be reflected in participants' environmental knowledge, as well as their perceptions of the Mimico Creek environment.

Participants from all focus group sessions recognized the importance of keeping the creek clean. As a participant from the SM2 group noted, "if you have a clean environment [referring to the creek], you have a healthy environment." Participants acknowledged that the environmental health of the creek is relevant to their health, at both individual and neighbourhood levels. However, many participants expressed their distress with the current environmental quality of the Mimico Creek. As a participant from the LA9 group noted, "[i]t would affect us [Malton residents] if it's [the Mimico Creek] dirty." Another participant from this group observed that, "[i]f you walk outside by it, you would think it's clean. But, then you see." Participants from this group explained that the current environmental quality of the Mimico Creek reflects an unfortunate lack of respect for the environment. Indeed, participants from all groups explained that low environmental health of the Mimico Creek has the potential to compromise individual and, in particular, neighbourhood health.

Participants often identified the source of the trash and litter in the creek as uncaring residents and users of the creek environment. A participant from the LA12 group highlighted the presence of "shopping carts [and] mattresses" in the creek, which clearly have been intentionally deposited. As one participant from the LINC5 group noted, "people throw their shopping carts, garbage, plus big box to the river. They contaminate it." This example makes sense in light of the type of contamination in the creek environment. Participants also identified the effects of pollution (often non-visible) in the Mimico Creek. For example, a participant from the LA12 group observed that, "[in] certain areas of the creek, it gives off funny smells…" A participant from the LA9 group also explained that he associated the creek with "[d]iseases, germs… a nasty smell," and that he considered the Mimico Creek to be polluted quite beyond the apparent litter and trash present in sections of the creek, in terms of overall low environmental health.

While participants from all groups noted that they perceive the environmental health of the Mimico Creek to be compromised, many participants also contended that the

environmental health of the Mimico Creek has declined over time. As a participant from the LA12 group, a life-long resident of Malton, noted, "when I was younger—I grew up in Malton—when I was a kid, every day I used to go there for hours, to run up and down, with all my friends, like fifteen of us, all on my street, but now it's all… pollution is there…." However, there also seemed to be a perception that the water of the creek was itself polluted and unsafe, yet was not causally related to litter or trash in the creek by all focus group participants. Some participants discussed examples, which they explained serve as informal indicators for factors such as water quality. For example, several participants across focus group sessions used the relative presence of ducks from year to year as an environmental indicator of water quality of the Mimico Creek. As a participant from the SM2 group noted, "[d]ucks die in it—it's gotta be bad. Ten years ago, you could see ducks, the little families. They wouldn't come back if it's so mucky and dirty." A participant from the LA12 group exclaimed that, "[y]ou see ducks sitting in a shopping cart," while members of this group expressed their agreement and sadness at this occurrence.

Participants also commented on the difficulty of keeping the creek clean. A participant from the SM2 group explained that it "[w]ould be a miracle… It would be hard, but it would be lovely," if the Mimico Creek were to be cleaned up. Some participants described their personal involvement in creek cleanup efforts. A participant from the SM1 group, who has been involved in cleanup efforts with the St. Mark's Church group, commented that, "[w]hen you clean it up, it'll look perfect, and then an hour later, you'll go back and think, 'Did I do anything?'" This participant expressed his frustration at the needed scale of cleanup efforts. He also highlighted the presence of large items in the creek, for example, shopping carts and an oil bin, which require professional removal. Specifically, participants from the LA9 group had been involved in clean-up efforts in their Grade 9 Geography class at Lincoln Alexander Secondary School. One participant from the LA9 group noted that "[the Mimico Creek] is pretty dirty, because garbage is around it… we picked up a lot of garbage bags." This participant described the items present in the Mimico Creek during their clean-up: "Eight garbage bags, seven shopping carts… A dead cat and mouse. And a diaper and people's underwear." This observation was supported by other members of the LA9 group who had also participated in the class's creek clean-up efforts. While this example is particularly graphic, it is unfortunately not all together uncommon.

Many participants involved in creek cleanup efforts have consistently highlighted the large—and arguably excessive—amount of litter and trash needing to be removed. However, it should be noted that certain sections of the Mimico Creek are more in need of cleanup than others.[116]

Thus, while participants indicated that the environmental health of the Mimico Creek is important for human health and the health of other species and biological communities, when discussing the environmental health of the Mimico Creek, participants focused on negative examples and highlighted the low environmental health of the creek area. Participants went on to link the environmental health of the Mimico Creek to health at the individual and neighbourhood levels. These links are discussed, in turn, in the following sections.

4.6.3.2 The Mimico Creek and Individual Health in Malton

In order to contextualize the self-rated health status of participants, participants were asked to rate their own health status on the survey. A large majority of participants, 82.1%, indicated that they consider their health to be 'good,' 'very good,' or 'excellent' over the past two years, while only 17.9% rated their health as 'fair' or 'poor' during this time period.[117] It may be that self-rated health status is related to participants' use of the natural environment. In general, participants may be more likely to use natural environments, like the Mimico Creek area, if they are healthy enough to do so; however, health status may also influence type of use. For example, since participants have identified the natural environment as important for their personal well-being, it may be that participants are more likely to spend time in natural spaces if they consider themselves to be experiencing health difficulties. In addition, time spent in natural environments may also be a function of perceived environmental health, as participants have consistently linked environmental health and human health.

In order to get a sense of participants' views regarding specific links between the Mimico Creek environment and health at the individual level, using the survey, participants were asked to indicate how important they consider the Mimico Creek to be for improving

[116] Since participants were not required to indicate which section(s) of the creek they referred to in focus groups, it may be difficult to identify particular areas in need of cleanup.
[117] This question was asked in order to relate health status to participants' views of the Mimico Creek area. However, relationships between health status and views of the Mimico Creek were not found to be statistically significant.

their physical health and emotional well-being. Participants' responses are listed in Table 4.12[118] below:

Table 4.12: Importance of Mimico Creek for Physical Health and Emotional Well-Being

Aspect of Health	Important (%)	Neutral (%)	Not Important (%)
Physical health	54.4	19.3	26.3
Emotional well-being	48.2	19.6	32.1

About half of participants, 54.4%, indicated that the Mimico Creek is important for improving their physical health. However, since a large majority of participants indicated that they consider the natural environment to be important for their well-being[119]—which clearly includes physical health—it is likely that perceptions of low environmental health of the Mimico Creek area detract from participants' views of its importance for their physical health. In addition, since many participants rated their health highly, it may be that they perceive a different influence to their physical health than they would if their health status were lower. Interestingly, less than half of participants, 48.2%, indicated that the Mimico Creek is important for their emotional well-being. It is possible that participants view the Mimico Creek environment as healthy enough to have some benefits for emotional well-being, but do not consider these benefits to be significant enough to improve their health. Notably, as mentioned, the sample size of this survey generally prevents discussion of statistical significance across survey questions. Interestingly, however, this question was found to be related to the issue of connection to the natural environment,[120] in such a way that this relationship is statistically significant.[121] That is, those who indicated that they feel a sense that they are connected to the natural environment were more likely to indicate that the Mimico Creek is important for their emotional well-being.[122] This pattern is reflected in the literature, in which emotional attachment to the natural environment is found to be related to personal restorative experiences in natural spaces (see Hartig et al., 2001). Thus, it may be that, in general, participants feel that the Mimico Creek, as a natural environment, has the potential to positively influence their emotional well-being, but in such a way that this

[118] Note that participants who responded 'very important' or 'somewhat important' are pooled under 'important'; participants who disagreed are pooled similarly. Participants who responded 'neutral' were not pooled. Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.
[119] Question 1h under 'Connection to the Natural Environment.'
[120] Question 1a under 'Connection to the Natural Environment.'
[121] Using Chi-square tests with 95% confidence intervals.
[122] $p<0.003$

relationship is sensitive to environmental health, or—as shown—to perceptions of a personal connection to the natural environment. However, while participants indicated their views of the importance of the Mimico Creek for aspects of individual health on the survey, they were able to highlight links between the Mimico Creek environment and individual health during focus group discussions.

During focus group sessions, when asked whether they feel that the Mimico Creek influences their personal health in any way, participants responded overwhelmingly that it does, in both positive and negative ways, with only few participants stating that they do not feel that the Mimico Creek affects their personal health. However, again, negative examples dominated focus group discussions. Participants noted that the environmental health of the Mimico Creek is an important factor that affects how they feel the Mimico Creek influences their own personal health.

Many participants gave examples of how they feel that the Mimico Creek affects their personal health in positive ways, focusing on physiological and psychological aspects of health. One participant from the MBD group simply noted that the Mimico Creek affects his health "in a good way," while many participants gave specific examples. Some participants identified the environmental benefits of the natural environment of the Mimico Creek as a positive influence on their health. For example, a participant from the SM1 group noted that the Mimico Creek positively affects her personal health because "the trees do give us oxygen," and plentiful oxygen is necessary for health. Yet, while some participants highlighted such environmental benefits of the creek, more participants focused primarily on the psychological benefits of the creek environment, vis-à-vis its influence on their personal health. One participant from the SM1 group commented that the positive effect of the creek on health "is psychological," which reflected the input of many participants across sessions. Indeed, many participants highlighted positive psychological effects from visiting the creek, for example, through enjoyment of the natural environment of the creek, as the presence of nature presents opportunities for relaxation and stress reduction. One participant from the MBD group described the positive psychological effect of the Mimico Creek on his health, as follows:

> If you're a person who likes that kind of environment, like natural things, trees, grass, little creek… It helps you think positive. So, if you can think positive about that kind of a thing, I'm sure it will help your personal being, by just thinking of it that way, and believing it in that way. It may not, overall, for everyone, but in a personal way, I think if you believe in natural things, trees and forest, or stuff like that, sure those things do influence your health, play a part in your health. Maybe not whether or not you have cancer, but just by your thought, it gets you to relax, instead of getting stressed out in a different environment.

It is clear that the Mimico Creek area is viewed as beneficial for health, for the ways in which the environment contributes to mental well-being. Participants from the LA12 group noted the positive influence of the creek on overall individual well-being, and indicated the importance of preserving the environmental health of the Mimico Creek for this reason. Indeed, participants noted that the perceived environmental health of the Mimico Creek influences their perception of its health-enhancing effects. A participant from the SM1 group noted, "you feel better when it's [the Mimico Creek] clean." This sentiment was echoed by a number of participants across groups. One participant from the MBD group explained that the Mimico Creek—and its environmental health, in particular—influences his personal health:

> I think that that's the heart of the whole scene that you've come to appreciate and accept… As it is, [the Mimico Creek] could be improved, substantially, but if that influences your health process... the thinking that you are carrying is very much influenced by where you live…I know where I live and where we all [Malton residents] live, that's [the Mimico Creek] certainly an influence.

This participant indicated that the Mimico Creek affects his personal health because of its presence in Malton, and the fact that it constitutes such a significant part of Malton's natural environment. Furthermore, participants across focus group sessions indicated that if the Mimico Creek were cleaned up, they expect that its positive effects on health would be enhanced.

While participants from all groups gave positive examples of how they feel the Mimico Creek affects their personal health, many negative examples also emerged at the individual level. One participant from the LINC5 group made a link between the Mimico Creek and the West Nile Virus, noting that he associates the environment of the creek with a

breeding ground for mosquitoes, the carriers of the West Nile Virus. While he has never contracted this virus, he admitted that he does worry that either he or his dog may contract the virus while out for a walk at the creek. Participants also noted that potential positive effects are diminished when the Mimico Creek natural environment is perceived to be unhealthy, due to the presence of trash, litter, or pollution in the creek or surrounding area. As one participant from the MBD group noted, "[the Mimico Creek] can be a negative thing [in terms of health], too, because if it's not properly kept, if it's not maintained, it can then become the reverse of what it may be there for." As such, some participants noted that low environmental health may have negative psychological effects. One participant from the SM2 group simply noted that "[i]t depresses me," owing to the presence of garbage and litter in the creek area environment. While participants focused primarily on the effects of the natural environment of the Mimico Creek area, some participants also noted that the social environment of the Mimico Creek also has the ability to negatively affect their personal health. As a participant from the LINC5 group noted, "[i]f I go in the day, it is safe for me, but if I go at the night, it may be dangerous, but if I go at night, it may be dangerous, because I may meet the people who are not nice, and are a part of the environment, too." This participant indicated that, while he enjoys walking by the creek, he would not do so at night due, in effect, to the social environment of the creek, and a fear of being approached by potentially dangerous people. Thus, it is clear that many participants perceive that both the natural and social environments of the Mimico Creek serve to influence their personal health. However, some participants indicated that they do not share this view.

Although the majority of focus group participants indicated that they consider the Mimico Creek to have an influence on their own personal health, positive and negative ways, some participants did not feel that the creek affects their personal health in any way. Specifically, a minority of participants from the LA11 and LA12 groups indicated that they do not feel influenced by the creek on a personal level. When prompted to explain their opinions, these participants indicated that they consider their use of the creek to be minimal and, as such, that they consider the creek's influence on their own health to be minimal or non-existent. One participant from the LA12 group stated that the creek would not have the ability to affect his health "unless I'm walking through it." Another participant from the LA12 group explained the view that the creek does not necessarily influence health at an

individual level, as follows: “It’s because we’re not always around it, it’s just something we might just go past once in a while, and it’s there, but we’re not really interacting with it.” Thus, while many participants indicated that the Mimico Creek influences their personal health, some participants indicated that they did not perceive this linkage to their own health. However, some participants who did not feel that the Mimico Creek influenced their health did indicate that if they were to spend more time near the creek, it could have a potential impact on their health. Owing to the perception of low environmental health of the Mimico Creek area by many focus group participants, it could be argued that conscious avoidance of the Mimico Creek area indicates a perception that the creek has the potential to influence health at an individual level. When considering the responses of participants who did not feel that the Mimico Creek influences their health, it could be argued that avoidance of the creek area for reasons of low environmental health actually reinforces the connection between environmental health of the creek and health at an individual level, though in a negative way.

With regard to health at the individual level, it is also useful to explore whether participants feel that the presence of the Mimico Creek in their neighbourhood positively influences their health, in relation to that of individuals who live farther away from a similar natural environment. On the survey, participants were asked, “Do you think that having the Mimico Creek in your neighbourhood makes you healthier than residents[123] who live farther away from a creek or river area?” Participants’ responses are listed in Table 4.13[124] below:

Table 4.13: Relative Effect of Mimico Creek for Personal Health

Response	Number of Participants	Percent
Positive Effect	20	35.7%
No Effect	7	7.1%
Negative Effect	4	12.5%
Don’t Know	23	41.1%
Not Applicable[125]	2	3.6%

About a third of participants, 35.7%, responded in the affirmative, indicating that they think that having the Mimico Creek in their neighbourhood makes them healthier than

[123] The way this question is worded, it could be interpreted to include only Malton residents, and their proximity to the Mimico Creek, or to include residents in the city as a whole, and their proximity to a creek or river area.
[124] Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.
[125] Participants were asked to indicate ‘not applicable’ if they do not consider the Mimico Creek to be part of their neighbourhood.

residents who live farther away from a creek or river area. However, 12.5% of participants indicated that they consider this relationship to be relatively negative, while 7.1% indicated that they think that the Mimico Creek does not have an effect in this regard. However, the largest group of participants, 41.1%, indicated that they do not know whether the presence of the Mimico Creek makes them healthier than other residents. Thus, while many participants felt that the Mimico Creek influences their personal health, it may have been difficult for participants to make this comparison with residents from other areas.[126] This may be due, in part to participants' perceptions of other residents' proximity to creek environments.

Thus, results demonstrate that use of the Mimico Creek by focus group participants is related to participants' perceptions of the creek as a positive or negative environment for health, at an individual level. This relates closely to perceptions of the environmental health of the Mimico Creek, as participants have indicated that environmental health is related to human health at various levels. Since the Mimico Creek is a neighbourhood feature in Malton, it also makes sense to examine links between the Mimico Creek environment and health at the neighbourhood level.

4.6.3.3 The Mimico Creek and Neighbourhood Health in Malton

In order to get a sense of participants' views regarding specific links between the Mimico Creek and health at the neighbourhood level, using the survey, participants were asked to indicate how important they consider the Mimico Creek to be for improving specific aspects of health. Participants' responses are listed in Table 4.14[127] below:

Table 4.14: Importance of Mimico Creek for Improving Neighbourhood Health

Aspect of Health	Important (%)	Neutral (%)	Not Important (%)
Health of individuals in neighbourhood	63.2	26.3	10.5
Health of neighbourhood	70.2	21.1	8.8
Health of children in neighbourhood	75.0	16.1	8.9
Health of pets in neighbourhood	66.7	29.8	3.5

[126] This may be due to the difficulty in drawing theoretical relationships about the health of others. It also may be difficult for participants to compare one type of natural environment—e.g., a creek area—with other types, in relation to health.
[127] Note that participants who responded 'very important' or 'somewhat important' are pooled under 'important'; participants who disagreed are pooled similarly. Participants who responded 'neutral' were not pooled. Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.

Nearly two-thirds of participants, 63.2%, indicated that the Mimico Creek is important for the health of individuals in their neighbourhood. This percentage is higher than those participants who indicated that the Mimico Creek is important for health at the individual level. Perhaps this is due to consideration of the Mimico Creek as a neighbourhood feature. As such, participants may feel that the Mimico Creek is potentially important for the health of other individuals in their neighbourhood, even if they do not consider it to be important for their own personal health.

In addition, a greater percentage of participants felt that the Mimico Creek is important for the health of their neighbourhood as a whole, than for individuals in their neighbourhood. A large majority of participants, 70.2%, indicated that the Mimico Creek is important for the health of their neighbourhood. This difference indicates that participants do not consider their neighbourhood simply as a collection of individuals. Notably, as mentioned, the sample size of this survey generally prevents discussion of statistical significance across survey questions. Interestingly, however, this question was found to be related to the issue of connection to the natural environment,[128] in such a way that this relationship is statistically significant.[129] Those participants who indicated that they feel a sense that they are connected to the natural environment were also more likely to indicate that the Mimico Creek is important—that is, 'somewhat important' or 'very important'—for improving the health of their neighbourhood.[130]

An even larger percentage, exactly three-quarters, 75.0%, of participants indicated that the Mimico Creek is important for the health of children in their neighbourhood. This is consistent with participants' indications that the natural environment is important for the health of children. Thus, even participants who are not themselves parents, may consider the Mimico Creek, as the main natural environment in Malton, to be important for the health of children in their neighbourhood. Finally, two-thirds of participants, 66.7%, indicated that the Mimico Creek is important for the health of pets in their neighbourhood. This lower percentage may reflect participants' indications that the Mimico Creek may not be an optimally healthy environment for walking pets. Thus, participants indicated the importance

[128] Question 1a under 'Connection to the Natural Environment.'
[129] Using Chi-square tests with 95% confidence intervals.
[130] $p<0.045$

of the Mimico Creek for health in their neighbourhood. As such, it is also useful to explore whether participants view their neighbourhood as relatively healthy in relation to other neighbourhoods.

Participants were asked, "Do you think that having the Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city?"[131] Participants' responses are listed in Table 4.15[132] below:

Table 4.15: Relative Effect of Mimico Creek for Neighbourhood Health

Response	Number of Participants	Percent
Positive Effect	20	35.7%
No Effect	6	7.1%
Negative Effect	4	10.7%
Don't Know	23	41.1%
Not Applicable[133]	3	5.4%

Only 35.7% of participants responded in the affirmative, indicating that they think that having the Mimico Creek in their neighbourhood makes their neighbourhood healthier than neighbourhoods in other parts of the city. However, 10.7% of participants indicated that they consider this relationship to be relatively negative, while 7.1% indicated that they think that the Mimico Creek does not have an effect in this regard. However, the largest group of participants, 41.1%, indicated that they do not know whether the presence of the Mimico Creek makes their neighbourhood healthier than neighbourhoods in other parts of the city. This response was nearly identical to participants' similar comparisons at the individual level. Thus, it may be that, while participants recognized that the Mimico Creek influences the health of their neighbourhood, it was difficult for participants to make this comparison with neighbourhoods in other areas of the city. This is especially understandable, given that many Malton residents are newcomers to Canada, and may not be familiar with other areas of Mississauga. However, while participants indicated their views of the importance of the Mimico Creek for aspects of neighbourhood health on the survey, they were able to

[131] This question indirectly implies that neighbourhoods in other parts of the city do not have the presence of a creek or river system in their neighbourhood. However, due to its wording, participants may answer in the affirmative due to the positive nature of creeks and river systems, or because of the Mimico Creek, in particular.
[132] Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.
[133] Participants were asked to indicate 'not applicable' if they do not consider the Mimico Creek to be part of their neighbourhood.

highlight links between the Mimico Creek environment and neighbourhood health during focus group discussions.

During focus group sessions, when asked whether they consider the Mimico Creek to be important for the health of their neighbourhood, participants responded overwhelmingly that they do. In fact, no participants indicated that the Mimico Creek does not affect health at the neighbourhood level, unlike some participant responses regarding health at the individual level. Participants seemed to more readily associate the Mimico Creek with the health of their neighbourhood than with their own individual health. One explanation for this is, while the creek is a neighbourhood feature—and thus an inextricable part of the neighbourhood—individuals may choose whether to personally interact with it. Indeed, participants from all groups indicated that they feel that the Mimico Creek is important for the health of their neighbourhood and community, and many also took the opportunity to explain why this is so. Some participants highlighted the very presence of the Mimico Creek as important for neighbourhood health. A participant from the SM1 group noted that the Mimico Creek, as a neighbourhood feature, is important "for everyone," referring to all residents of Malton. A participant from the LINC5 group indicated that the Mimico Creek is an important "part of the neighbourhood, because it's around the neighbourhood," indicating that the mere presence of the creek is enough to make it a notable neighbourhood feature, and potentially important for health. A participant from the MBD group also indicated that he considers the presence of the Mimico Creek to be important for the health of the neighbourhood:

> I think it's very important—there's no doubt. It can be seen in different ways, because if you're talking about the neighbourhood, now we're wide range, so we're talking about the entire Malton area, and to me, it's important. But, maybe, just by driving through and looking at it, and not even knowing what does on down inside there, just to know that there's a creek there, that there's a greenbelt, a little green space….

This participant indicated that, although individuals may or may not be aware of the presence of the creek, it is nonetheless important for the health of the community, especially for the natural space that it provides. A participant from the LINC5 group also argued that the creek is an integral part of the natural environment in Malton and needs to be considered in relation to neighbourhood health. He noted that "[w]e should see and look at this [the Mimico Creek] in a holistic way," indicating that it is essential to view the natural

environment of the creek as an integral part of Malton. A participant from the LA11 group illustrated this view by stating that the creek is important for the health of everyone in Malton, "[b]ecause it's not just us [Lincoln Alexander students] who pass by it, it's other people and animals." This participant indicated that, regardless of the influence of the Mimico Creek on one's health at an individual level, the creek serves to affect neighbourhood health by influencing the health of others in the neighbourhood, as well as area wildlife. Thus, participants indicated that they do consider the Mimico Creek to be important for the health, at the neighbourhood level.

When asked why they consider the Mimico Creek to be important for the health of their neighbourhood, discussion focused on natural environment. Many participants highlighted benefits to neighbourhood health of a healthy natural environment of the Mimico Creek area. Participants often spoke generally about the influence of the Mimico Creek on health, and highlighted aspects of the creek environment which they feel influence the health of other individuals, and the neighbourhood, as a whole. Here, participants identified aspects of the Mimico Creek area which they feel have the potential to influence the health of other individuals, even if they themselves do not directly benefit. In particular, many participants noted the potential positive psychological influence of the creek for the health of all neighbourhood residents. For example, several participants noted that the Mimico Creek benefits community health for the relaxation opportunities it provides. One participant from the LA12 group noted that the Mimico Creek "[is] so calming" and has a positive effect on the psychological health of those who use the creek. Another participant from the LA12 group agreed, "[i]f you [Malton residents] walk in it, you can get a sort of calming effect, because it is quieter…." This participant also mentioned that if Malton residents were to take the time to walk in the creek area, it would likely prove to be beneficial for their psychological health. This participant further illustrated this point by asking the group to imagine what Malton would be like without the presence of the Mimico Creek natural environment. He commented, "I think if it wasn't there, it would affect us [in a negative way]…." This participant noted that, while the Mimico Creek natural environment is in need of improvement, the existing environment is preferable to having no such natural space in Malton. In addition to the beneficial psychological effects of the creek, a participant from the LINC5 group pointed out that the Mimico Creek environment positively affects the health of

the neighbourhood for the greenspace and recreational opportunities it provides for residents. This participant commented that the creek area is "very, very important, because Mimico Creek has field sports, and basketball, jogging…." This participant indicated that the Mimico Creek area provides opportunities for both casual and organized recreational activities, which have a positive effect on the health of neighbourhood residents. However, while some participants highlighted a positive influence of the creek on neighbourhood health, others identified negative effects to neighbourhood health of low environmental health of the Mimico Creek.

Several participants also took this opportunity to mention possible improvements to the Mimico Creek that could enhance the health of their neighbourhood, namely, cleaning up the creek. Throughout all focus group sessions, participants indicated that pollution in the creek is a health-compromising feature. A participant from the SM2 group explained, "[i]f [the Mimico Creek] would get clean, you know, it would be very healthy for the communities [in Malton]." This sentiment was echoed by participants across focus group sessions. A participant from the LA11 group commented that "[i]f it [the Mimico Creek] was cleaner, then maybe it would [be important for neighbourhood health]." Furthermore, participants mentioned that cleaning up the creek would likely lead to increased use by Malton residents. A participant from the LA12 group noted the popular sentiment that, "if it [the Mimico Creek] were cleaned up, I'm sure people would take more advantage of it." Thus, it is clear that participants feel that the environmental health of the Mimico Creek area is relevant for health at the neighbourhood level. In particular, participants highlighted effects of the Mimico Creek environment on the health of children in the neighbourhood.

Some participants related the environmental health of the Mimico Creek area to use of the creek by children. As participant from the LA11 group noted, "[y]ou don't see anybody around it, and if it did affect our health [in a positive way], you would see children playing by it." A participant from the SM1 group explained that, if the Mimico Creek were cleaned up, residents might bring their children to play there more often. She explained that "[i]f more people are aware of it… and it's clean, people may be inclined to bring children there…" This participant noted that park-like environments contribute to children's health and education. A participant from the LA12 group also noted that park environments like the Mimico Creek area could be beneficial for children's social interaction. She explained that:

> if you… have a place like that, that's where young kids who only know people in their class [at school], they get to meet people from different cultures, because we have a lot of different cultures in Malton, to get exposed….

As such, what may be casual use for adults may serve a more important social role for children in the neighbourhood. Participants also highlighted the educational value of nature and the Mimico Creek to children in the neighbourhood. A participant from the SM1 group explained:

> I know when [the Mimico Creek] had the bulrushes, and you could see the bulrushes, I know my children used to love going and watching the ducks, and the little baby ducks, they got a great kick out of that… But, that was really educational for them, they enjoyed that, really, but you can't see anything now.

Another participant from the SM1 group agreed that, "with all the tall grass there, it's very hard for kids to get to the creek now…." These participants identified that naturalization efforts have made the creek less accessible and, in turn, have made parents less likely to allow their children to play near the creek.[134] These are all important points in relation to neighbourhood health.

Children often enjoy playing in parks and natural environments; yet, understandably, their parents and guardians must perceive the environmental health of these areas must be suitable for their use. It is likely, however, that parents may be more cautious in allowing their children to use an area of low perceived environmental health, than adults would be with themselves. Recall that, on the survey, less than a third, 30.2%, of participants indicated that they consider the creek to be a healthy environment for children's play activities (question 2c). The relatively low percentage of participants who felt that the Mimico Creek is a healthy environment for children's activities likely reflects perceptions of low environmental health of the creek area. Indeed, participants indicated that they would be more inclined to allow their children to play in natural areas which they considered to be of good environmental health. As such, while the majority of participants agree that the natural

[134] Of course, it could also be argued that, in general, parents are less likely to allow their children to play outdoors while unsupervised, than they were in the past. Some older participants recalled their unsupervised outdoor play as children, which children of today may be shielded from for concerns related to society, rather than the natural environment, in particular. However, environmental concerns, for example, West Nile Virus, may also play a role.

environment is important for children's well-being, participants—especially those who are also parents or caregivers—may be sensitive to the quality of the natural environment when allowing children to frequent natural spaces, as they highlighted the low environmental health of the Mimico Creek as a deterrent to allowing children to play near the creek area. Indeed, perceptions of low environmental health may influence adults' perceptions of the suitability of the Mimico Creek environment for children's play, and may therefore reduce children's use of the creek. Thus, while participants feel that the natural environment is important for their well-being and that of children, environmental health is arguably a key factor in determining both time spent in natural spaces, and the type of activities engaged in.

With regard to perceptions of environmental health and use of the creek, participants indicated that, in general, the 'wildness' of the Mimico Creek—related to recent naturalization efforts—has compromised their ability to use the creek and, in turn, has reduced the benefits to neighbourhood health associated with the presence of the creek in Malton. A participant from the SM1 group—who lives beside the creek—mentioned that, "[w]hen we first [moved to Malton], we could see the water, but now we can't see the water," referring to the view of the creek from her home. Another participant from this group agreed, and explained that, "[i]t's almost like they've let it go to seed, really. It's just like somebody said, 'We consider it a natural space, a natural environment, so we've just let nature take over.'" He explained further that, "you've changed the whole dynamics, by letting it go wild." The issue of the 'wildness' of the creek was mentioned by participants across focus group sessions, in relation to health at the neighbourhood level. This is discussed further in the following section.

In summary, participants discussed characteristics of the Mimico Creek which they consider to be important to the health of their neighbourhood, in particular, cleaning up the creek, and making it more accessible for adults and children alike. Participants indicated that the perceived environmental health of the creek is closely related to their perception of the importance of the Mimico Creek for the health of their neighbourhood. This makes sense in the context of focus group discussions, as participants consistently indicated that environmental health is related to human health at various levels. Considering the health of the neighbourhood, as a whole, gave participants a chance to focus on the health of their fellow Malton residents, as well as the health of children in their neighbourhood. While

many participants gave examples of the importance of the Mimico Creek for the health of individuals, many participants clearly indicated that it is the importance of the creek to residents, as a whole, that is important for health. As such, many participants gave examples of use of the Mimico Creek which reflects its importance for neighbourhood health, even when their own personal use differed from the highlighted uses. For example, participants indicated that, while park-like or natural environments like the Mimico Creek area are of benefit to children's health, social interaction, and education, the health of the natural environment is a key factor in determining these benefits, as well as in informing parents' decisions to allow their children to play in such environments. Participants also touched on the effect of naturalization efforts on the health of their neighbourhood, and indicated that, in some cases, the resulting 'wildness' of the creek environment may actually inhibit use and compromise this aspect of neighbourhood health. Discussion of the Mimico Creek environment and health at the neighbourhood level allowed participants to conceive of possible improvements to the Mimico Creek environment that they feel would benefit their health. These suggestions are discussed in the following section.

4.6.4 Improving Mimico Creek to Improve Health in Malton

On the survey, participants were provided with a chance to give open-ended suggestions in response to improvements they would like to see to the Mimico Creek, in order to improve their health. These (first mentioned) responses are shown in Table 4.16[135] below:

Table 4.16: Participants' Suggestions to Improve to Mimico Creek in Order to Improve Health

Participants' Suggestions (First-Mentions Only)	Number of Participants	Percent
Clean Up Creek	33	63.5%
Prevention and Enforcement	11	21.2%
Beautify Creek Area	3	5.8%
Other	5	9.6%

When asked to list up to three things about the Mimico Creek that need to be improved in order to maintain or improve their health, participants focused on three main responses.[136]

[135] Numbers represent valid percent, as LINC5 participants did not answer this section of the survey.
[136] This includes first-mentioned responses only. While most participants indicated a first response, fewer suggested a second response, and less than half indicated a third response. Thus, only first-mentioned responses are used.

Nearly two-thirds of participants, 63.5%, indicated that cleaning up the creek environment is the most important thing about the Mimico Creek that must be improved in order to improve their health. About a fifth, 21.2%, of participants indicated that prevention of litter or enforcement of environmental laws is the most important things to improve about the creek in order to maintain of improve their health. A small percentage of participants, 5.8%, indicated that it is most important to beautify the creek area or to reduce the wildness of the creek in order to maintain or improve their health. Finally, 9.6% of participants chose other individual options which did not fall into these three categories. While participants chose these responses in advance to focus group discussions, these categories of responses closely reflect those discussed during focus group discussions, with similar emphasis by participants. This lends even greater emphasis to these particular suggestions as relevant for improving health in Malton, through improvement of the Mimico Creek area.

When asked the question, "If you could change one thing about the Mimico Creek area that would improve your health, what would it be?" participants focused their responses on a few main areas of the natural and social environments:[137] cleaning up Mimico Creek; preventing litter and enforcing litter laws; promoting community involvement and awareness; improving access to Mimico Creek; and improving the visual appearance of the Mimico Creek, and making it less 'wild'. Participants from all focus group sessions indicated that, by far, the most important thing to change about the Mimico Creek area in order to improve their health was to clean up the creek. In actuality, the other answers given relate closely to cleaning up the creek, and serve as extensions of this argument. Many of these emergent suggestions relate closely to each other, and they will be explored in the context of improving the Mimico Creek to improve individual and neighbourhood health in Malton.[138]

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[137] Focus group participants were asked to discuss one thing to change about the Mimico Creek that would improve their (personal) health, and were given the opportunity to list up to three things on the survey, completed prior to the discussions. However, discussion in focus group sessions often extended to a variety of responses, as participants responded, in turn, to each other's suggestions. I felt this interaction allowed valuable information to emerge from the sessions, which may not have emerged otherwise and so encouraged this interaction among participants. In addition, participants also focused on improving the Mimico Creek to improve the health of their neighbourhood. I encouraged these responses, as well, as they are clearly relevant to exploring links between the Mimico Creek and health in Malton.

[138] The premise which underlies participants' arguments for improving the creek in order to improve health is that healthy natural environments promote human health, while unhealthy natural environments compromise human health. Participants made this connection at a variety of scales, when discussing the natural environment in general, and at the neighbourhood level. Participants also indicated that they made this connection with the Mimico Creek environment, such that their use of the creek is partially dependent upon their perceptions of the environmental health of the creek and its potential effect on their personal health.

When asked how to improve the creek in order to improve their health, participants focused primarily on cleaning up the creek. As a first step, participants from the SM1 and SM2 groups suggested the need to "get everything [litter and trash] out that's already in [the creek]." This answer is not at all surprising, given the history of the discussion across focus group sessions, in which the environmental health of the Mimico Creek emerged as an issue related to health at both the individual and neighbourhood levels. Participants from the SM2, LA12 and LA9 groups also indicated that improving water quality is a key issue in improving the overall health of the Mimico Creek. Participants from across groups also indicated that the presence of shopping carts in the creek is particularly disheartening to their perception that the creek will ever be properly cleaned up. Participants indicated that preventing litter from entering the creek is a key part of preventing further environmental damage to the creek, and ensuring that the creek remains clean, once clean up efforts have occurred. One participant from the SM1 group stated emphatically that in order for the creek to remain clean, Malton residents must "[s]top people from dumping garbage in it!" This sentiment was echoed across focus group sessions, and often with similar emphasis. Participants also noted that, if the creek were clean, it would likely be utilized more often by Malton residents. A participant from the MBD group explained that:

> I think if it's clean, people would be more sensitive to know that the creek is around there. Because, you live in Malton, you walk by, you don't pay attention to the bush and the little stream. If it's clean, people will pay attention, and they will tend to, you know, go to nature a little bit more.

This is an interesting point, as it reflects responses from across focus group sessions. However, while a clean creek would be advantageous for all, participants also noted that efforts must be undertaken to preserve cleanliness.

Participants across groups suggested that enforcement of litter laws is important for preventing litter and keeping the Mimico Creek clean. However, participants across groups suggested that lack of sufficient signage may be a problem for preventing litter. One participant from the LA9 group pointed out that "[t]here are signs, but no one cares." However, participants from the SM1 group noted that cultural and language difficulties may also play a role in people's treatment of the creek, especially where signage is concerned. As a participant from the SM1 group had observed earlier in the session, "I guess we think that people going to be smart enough to know not to pollute the water, but if you don't post it,

then people don't realize." However, this participant made a point about awareness and diversity of culture in Malton. He noted, "I think that one of the things we have to consider is, the signs that are put up are only in one particular language—they're in English—and we have such a diverse culture here. We don't think to put the signs up in languages that other people can read." Another participant from the SM1 session, who is himself an immigrant to Canada, responded that "I think that is good—that sounds proper, yes. Because some people can't read English… Especially someone just visiting, coming from their own country, and then they come to Canada." As such, these participants argued that placing signs in a variety of languages may serve to enhance individuals' feelings of being part of the Malton community, and may therefore lead to more favourable environmental behaviour. However, even with the presence of signs, participants recognized that littering will likely still occur in the Mimico Creek. To compensate for this, a participant from this group suggested to "[m]ake one person in charge, so then if he sees a person is throwing his garbage or anything, make sure he gets a proper fine, so when people look at it, no one else will do that." Participants from the LA12 group also suggested adding more garbage cans for creek users to use. Those in the LA9 and LINC5 groups suggested installing cameras near certain areas of the Mimico Creek in order to aid in litter prevention efforts. These participants also pointed out that cameras could potentially help to improve safety in the area.

Participants also pointed to community involvement with the creek as important for improving their health, and that of the community. A participant from the MBD group simply noted that "[w]e [Malton residents] care about the creek." It is clear from focus group sessions, that many participants—all of whom are Malton residents—care about the Mimico Creek environment and would like to see it as a healthy natural environment. One way in which participants across focus group sessions proposed to accomplish this is by encouraging awareness of the Mimico Creek by other Malton residents. To illustrate, a participant from the SM1 group, who is herself involved in directing creek clean ups, explained:

> I'd like to see everybody taking some ownership of it. That everybody wants to participate with it and everybody wants to be involved with it, myself included. That impacts on the environment, but it also impacts on a community that knows each other better, and is interacting and interrelating and communicating, and that again… Once people know each other… You don't break into your friend's house, you know? So… I think that you clean up the environment and you get people using it and they're in community with that, then the whole neighbourhood becomes interactive, and it cuts down on other problems.

Throughout the focus group session, some participants illustrated that importance of environmental awareness in promoting community involvement and community health within Malton.

Participants across groups related community involvement to environmental awareness and environmental health. A participant from the MBD group commented:

> I think public awareness of the importance of preserving it… When I say 'preserve', I mean to keep it clean—and the importance of doing that. If anything has come out of this evening, that should be one very important part of it to convey to the community—what it did to the natural habitat, that sort of thing. So, apart from the cleaning up, I think public awareness will be very helpful.

This participant suggested that the addition of an informational plaque, for example, in Wildwood Park, might serve to educate park users as to the importance of the creek, and help to ensure environmental preservation. This participant indicated that environmental preservation is essential for environmental health and also contributes to neighbourhood health. Furthermore, one participant from the SM1 group pointed out that the cultural diversity of Malton necessitates efforts to enhance public awareness of the creek area. As this participant explained, "[w]here I come from [Guyana[139]]… a creek is something very, very big! … So, if they see that creek, they might say, 'This is not a creek, man, this is… a stream or something. Do you see the difference? They might not recognize this as a creek." This participant explained that this may affect how individuals may treat the creek. He added, "when I first came here, I saw the creek, and I thought, this couldn't be a creek, you know? It was very surprising for me, because it's just that, where I come from, I was not living far from a creek, but a creek is big, very big! It's like a river!" This participant emphasized the importance of environmental education—for example, the addition of

[139] Many members of Malton's community have come to Canada from South America and the Caribbean.

information in many languages—due to possible differences in perceptions of the Mimico Creek across cultural groups in Malton. This participant explained that, with environmental education, those not familiar with natural environments like the Mimico Creek may come to understand these environments. As participants frequently connected environmental health to individual and community health, efforts to promote awareness of the Mimico Creek area natural environment which lead to improvements in environmental health—say, through creek clean ups—would arguably have a positive effect on health at both the individual and community levels. Improving awareness may also encourage use of the creek area, which may serve to improve health through the positive effects of natural environments on individual and community health. Interestingly, participants tended to relate awareness of the Mimico Creek to health at the community level; however, participants related neighbourhood and community health to their individual health earlier in the discussion, noting that the health of the neighbourhood is one contributing factor to individual health. While awareness was discussed at the community level, efforts to clean up the creek and prevent litter were discussed at both the individual and community levels; yet, awareness, creek clean ups and prevention efforts are closely related.

While increased use of the Mimico Creek may be positive for health, participants noted that access to the Mimico Creek must be improved in order for more residents to make use of the creek. Participants from across focus groups indicated that adding walking trails and benches would make the Mimico Creek area more accessible. Participants from the SM1 group, in particular, highlighted the difficulties for seniors in utilizing existing paths on the banks of the Mimico Creek. As a participant from the SM1 group noted, "when somebody's going for a walk, and I'm sure at any given point in time, you'd like to be able to sit down, and just try and get in tune with nature around you. If there's no place to sit, then, right off the bat, that's a deterrent." Thus, poor accessibility can be a barrier for those who would like to utilize the Mimico Creek area, but who are unable to do so due to differing physical ability. Participants also pointed out that improved access may also serve to beautify the creek area, encouraging use in this way. As a participant from the SM1 group explained:

> if you make a nice sidewalk, and everything, it will be more attractive to people, people could walk, and you could see the river…. and it will look more attractive, people will see that something very good is happening. People will like to take the kids for a walk, and see what's really going on.

As participants mentioned earlier in the focus group sessions, opportunities for recreation and enjoyment of nature are benefits of the Mimico Creek area. However, participants noted that the 'wildness'[140] of vegetation surrounding the Mimico Creek compromises accessibility.

Participants from across focus group sessions noted that the wildness of the vegetation surrounding the Mimico Creek area often serves as a deterrent to use of the creek. By wildness, participants referred to the thick vegetation, such as tall grasses and reeds, which obscures views of the creek from paths and compromises human accessibility of the creek area. Participants from all focus group sessions indicated that, in their view, the presence of excessive vegetation compromises both use and health. A participant from the LA12 group commented that "the shrubbery around the creek is kind of wild and untamed." Another participant from this group explained that "[i]f you look at the grass, it's like a wall. It cuts off the creek so you can't see it." One participant from the LA11 group explained her frustration at the wildness of the creek by explaining, "[i]t's just messy." This participant indicated that the aesthetics of the creek would have to be improved in order for her to utilize it more often. Participants suggested possible improvements to the Mimico Creek area that would reduce the wildness of naturalization, and make the creek area more accessible. A participant from the LA11 group suggested that "[t]hey should try to make it more like a park-like area," while a participant from the SM1 group suggested to "make it a little less 'wild', more user-friendly." A participant from the LA9 group suggested to "[k]eep it maintained. Cut the area around it, keep the trees, but cut the area around it, 'cause then you start seeing what's there…." A participant from the LA12 group explained that:

> it doesn't look like a place where you'd say, oh, that's really pretty, I want to go there. But I bet… if you cut it [the grass] down to maybe a couple inches, and you put a couple benches… it'll look like somewhere we can actually go to relax… But if you look at it, it looks like it's just bush and creek. You can't even see the creek, actually, unless you walk right up to it.

In addition, a participant from the LINC5 group suggested enlarging the park areas surrounding the Mimico Creek to increase the area available for recreation opportunities. Participants explained that this kind of effort to beautify the creek and make it more

[140] This 'wildness' is in fact, not wild, but a result of naturalization efforts in the Mimico Creek watershed, which serve to enhance ecological health and integrity of the watershed. For a brief discussion of the rationale for these naturalization efforts, please refer to chapter 2.

accessible will likely have positive effects on the Mimico Creek environment. As one participant from the LA9 group noted, "[i]f you make it visually better, people don't abuse it—they use it." He explained further that:

> If you make it better, people will [say] 'It's all clean—just don't litter', because they'll have a better feeling. If it's dirty, people will [say], 'There's a lot of garbage, what is my can going to do?' then they'll just dump the can. They won't think that they're making it even worse.

Indeed, many participants perceived the wildness of the creek to be an indicator of poor environmental health.

In fact, the wildness described by many focus group participants is a result of efforts to naturalize the Mimico Creek watershed in order to improve environmental health. These naturalization efforts benefit wildlife in the area, providing natural habitat and green corridors for a variety of species. By allowing vegetation to grow freely over some sections of the creek, human access to the creek may, in turn, be compromised. Indeed, participants indicated that increased naturalization leads to decreased human access and, thereby, decreased use of the creek area. Participants also indicated that the wild appearance created by naturalization could lead to decreased perceptions of safety.[141] However, naturalization is also perceived by many participants as unhealthy for the natural environment. Many participants across focus group sessions indicated that they associated the wildness of naturalization with an uncared-for appearance of the creek. Perhaps, in this case, it does not help for litter and trash to be present in parts of in the creek, as perhaps these are associated with naturalization when the creek is perceived to be uncared-for. It should be noted, however, that some participants appreciated that naturalization efforts serve to enhance ecological health and improve the health of wild species in the area. A participant from the LA12 group pointed out that "if you do cut it [vegetation surrounding the creek] down, you are limiting other wildlife from coming." A participant from the LA11 group suggested that "[i]f they care about the animals… don't cut down the whole part. You know, make it nice." However, participants also recognized the importance of the creek as wildlife habitat. A participant from the LINC5 group noted that "[w]e should try to keep a balance between the

[141] This may be especially true because of the suburban environment in which the naturalization has been implemented. It is possible that these naturalized areas in urban or suburban areas may generate a greater potential for unfamiliarity or fear among residents who are not used to these, seemingly free-growing, types of environments. In general, research indicates that women may feel less safe in public parks (see, for example, Chiesura, 2004; Luymes and Tamminga, 1995).

nature and people." Thus, participants indicated the need to balance human and animal use of creek environment, that is, accessibility and naturalization. Thus, participants highlighted the wildness of the creek as an issue in need of improvement in order to increase use of the creek by Malton residents and to improve community health. While it was not the goal of this research to explore links between naturalization, environmental health, and use of the creek, these issues nonetheless arose during focus group sessions.

4.6.5 Environmental Health of Mimico Creek and the Social Identity of Malton

While it was not the goal of this research to explore the concept of neighbourhood, nonetheless, the issue of defining neighbourhoods did arise in the discussion. Interestingly, when discussing neighbourhoods and health, focus group participants discussed Malton as a neighbourhood unto itself. This issue arose in many focus group sessions, and allowed for further questioning regarding this issue. Although participants were asked about their own neighbourhoods, it became clear that Malton residents consider Malton to be a neighbourhood unto itself, rather than consisting of a number of smaller neighbourhoods. In fact, all participants who responded indicated that they consider Malton to be one neighbourhood. Thus, when participants refer to their neighbourhood, they are referring to Malton, as a whole—or, at least, do not consider their neighbourhood to be in any way apart from Malton as a community. One participant from the LA12 group explained, "[w]e don't talk about Malton…as being different parts of Malton. We all consider it to be one Malton." Others made reference to Malton's geographic location and its isolation from other areas of Mississauga, which some participants identified as a contributing factor to both environmental and community health in Malton. This can be considered important for exploring connections between the environment and health in Malton, especially as it relates to Malton's social identity and reputation, and the factors which shape community health in Malton.

While perceptions of the environmental health of Mimico Creek are related to individual and community health, they are also related to Malton's social identity. During focus group discussions, some participants made connections between the environmental health of the Mimico Creek and the social environment and reputation of Malton. These participants identified negative stereotypes of Malton which affect the way people interact

with the Mimico Creek in Malton. In general, Malton is subjected to negative stereotypes within Mississauga for being an area of lower socioeconomic status. While participants from all focus groups referred to Malton's social reputation—either explicitly or implicitly—participants from Lincoln Alexander Secondary School spoke at length about the stereotypes of Malton, and also discussed the environmental health of the Mimico Creek in this context. Specifically, participants from the LA12 group also related these stereotypes to clean-up and improvement efforts of the creek. One participant from this group illustrated his concern with the way that public property is treated in Malton and explained that:

> The only thing that I'm maybe careful of is that we're going to put in so much work, and it's just going to go to naught. If you really worked to plant trees and flowers [to improve the Mimico Creek area] and it just got vandalized, it would be kind of a waste of money.

However, another participant from the LA12 group explained that "I think that's just a stereotype that people have about Malton, and that, sometimes, people start thinking [Malton is] like that…." This participant added that "[this] stereotype… makes people not want to fix it up, because they don't look at the positive things, in that they [Malton residents] do care for it." This participant added, rather succinctly, that "[i]f people think less of it, they'll care less for it." Thus, participants related the environmental health of the Mimico Creek to Malton's social identity and stereotypes of, and within, the community. Participants went on to relate Malton's reputation to environmental health and clean up efforts by the City of Mississauga.

Participants explained that, in their view, Malton's social reputation also negatively influences clean up efforts the City of Mississauga, resulting in compromised environmental health, which itself serves to reinforce stereotypes of Malton. As a participant from the LA12 group explained:

> We don't have anyone, we don't have [the City of] Mississauga,[142] and the community, we don't have workers coming in and cleaning it—we don't have anyone. So maybe it's not even that we're keeping it dirty, maybe it's just that we don't have enough government workers coming and doing anything for it. And that's over many years that it came to be like that, it's not like they did anything to step in and clean it up ever.

[142] While Malton is a part of the City of Mississauga, participants often discussed Malton as a separate area, with a notably separate identity. This reflects a tendency among Malton residents to refer to Malton as a separate community. Indeed, as described in chapter 2, Malton is spatial and socially isolated from surrounding areas of Mississauga and nearby communities.

She explained further that:

> It also comes back to [the issue] that, in Malton, the income for the households is very low, and you tend to see that the government doesn't send community workers—help for people who live here. If you look at Mississauga, and you look at Malton, we don't look like we're a part of them—they don't send us any resources or anything. But if we were higher income, then they'd fix it up.

This view was also reflected in other focus group sessions. A participant from the SM2 group related a story about watching city employees cleaning the Mimico Creek:

> they come with their equipment and they clean up so much… [But] if I walk by, they're not taking it [litter and trash] all out. I mean, I can see their point—there's so much that… the fellows picking that up are like, 'Well, who cares, it's just this area.' That's the feeling.

This participant indicated that she felt that those cleaning up the section of the Mimico Creek in Malton are less likely to be concerned with its cleanliness than when cleaning up other areas, perhaps with higher social reputations. However, participants argued that clean up efforts by both residents and the City of Mississauga are essential for improving the Mimico Creek environment and health.

While participants identified that clean-up efforts are essential for improving the environmental health of the Mimico Creek, participants also expressed a desire for Malton residents to act to improve the environmental health of the Mimico Creek area. A participant from the LA9 group observed that, "you have to keep it maintained. When it's not maintained, people stop caring about it…." However, this participant also argued that, when the creek is maintained, Malton residents will take greater pride in it. This view was also reflected by a participant from the LA12 group, who explained, "no one takes special pride in it [the creek]—not that I know. We [Malton residents] have to take pride in it and say, 'Look at the creek, it's so pretty.'" However, participants from across focus groups indicated that it would be easier for Malton residents to take pride in the creek if it were cleaner. A participant from the LA12 group explained:

> I think that just because it doesn't look presentable… people just think of it as nothing. But if somebody actually starts caring about it, starts taking care of it, people will start acknowledging it [the Mimico Creek], and start saying, 'Ok, this is a nice area'… and overall it will become good….

Indeed, several participants suggested starting this endeavour 'close to home,' and involving Malton residents in cleaning up the Mimico Creek. Participants from the LA12 group agreed with one participant's expression of sentiment that, "[w]e'll never make Malton better [if we don't try]." Participants from the LA9 and LA12 groups clearly indicated their personal desire to clean up the Mimico Creek environment, in particular, the area behind their school.[143] In addition, some participants connected community pride in the health of the Mimico Creek environment to changing Malton's social reputation. A participant from the LA11 group indicated the importance of cleaning up the creek in order to change people's views of Malton as a community. She explained, "it is [important], because people in the other communities, they're going to link us to it, and whatever they perceive of the creek, they're going to think about the people living there, too." A participant from the LA12 group also illustrated this point, saying that:

> right now, they [residents from other areas of Mississauga] think, 'We're the ghetto, we're horrible'... But if we change, and we say, 'Look how good our creek is, look at our environment around us,' people will say, 'In Malton, they have such a nice creek there.'

Another participant from the LA12 group effectively summarized this discussion by explaining that "we have to change the way we see ourselves. When we change our environment, other people, outside—and their perception of us—will change." As such, the environmental health of the Mimico Creek may serve as a symbol for social change, both within Malton, and vis-à-vis its relationship with the City of Mississauga and surrounding areas.

Thus, the perceived environmental health of the Mimico Creek is related to the social identity of Malton. As participants have indicated, low perceived environmental health leads to decreased use of the Mimico Creek area, while decreased use is itself associated with compromised health of the creek's social environment, leading to concerns for safety. This, in conjunction with naturalization efforts, leads to decreased use of the creek environment. The environmental health of the Mimico Creek may serve as an indicator of social disparity, for Malton vis-à-vis other areas of Mississauga, or even other nearby communities. This is an interesting relationship, as it links the environmental health of the Mimico Creek area to

[143] While Lincoln Alexander Secondary School has an Environment Club which conducts creek clean-ups, these particular students were not part of the Environment Club at their school. Thus, their views may be taken to represent a growing desire among students, in general, to clean up the creek area beside their school.

perceived social identity in Malton. In addition, because perceived environmental health is related to perceptions of community health, the environmental health of Mimico Creek may affect perceptions of health in Malton at the neighbourhood level. However, given the existing negative stereotypes of Malton within Mississauga, this relationship may not be a welcome one for Malton residents. While it was not the goal of this research to explore links between Malton's social identity and environmental health, these issues nonetheless arose during focus group sessions.[144]

4.6.6 Summary

Participants highlighted links between the Mimico Creek environment and health using the survey and focus group discussions. On the survey, participants indicated that the Mimico Creek is important for health at both the individual and neighbourhood levels. Overall, participants indicated that the Mimico Creek is important for protecting human health and the health of wildlife around the creek area. In particular, participants indicated that the Mimico Creek is important for improving the health of their neighbourhood, as well as that of children in their neighbourhood. Finally, participants suggested improvements to the Mimico Creek that are necessary to maintain or improve health at the individual and neighbourhood levels.

In focus group discussions, participants indicated that their use of the Mimico Creek, as well as their ranking of its importance as a neighbourhood feature, are influenced by their perceptions of the health of the natural and social environments of the creek area. Participants clearly indicated that they are more likely to use the Mimico Creek area if they perceive it to be a healthy natural environment. However, when discussing the environmental health of the Mimico Creek, it became clear that the majority of participants view the Mimico Creek as an unhealthy natural environment. Participants discussed efforts to improve the creek in order to improve health, highlighting cleaning up the creek as the top priority for improving environmental and human health. Participants also made connections to the user-friendliness of the creek environment, and related this to the 'wildness' of the creek. It is clear from focus group discussions that participants relate the wildness of the Mimico Creek—and thus, naturalization efforts—with a neglected creek environment and

[144] Future research may be necessary to determine how Malton's reputation impacts health at the individual and community levels.

compromised environmental health. Many participants indicated that they would like to see a balance between naturalization efforts and accessibility. Some participants also argued that the environmental health of the Mimico Creek is related to Malton's reputation within the City of Mississauga. These participants indicated that stereotypes of Malton link environmental health and social health, in the sense that perceptions of poor environmental health of the Mimico Creek area are directly related to Malton's reputation as an area of low socioeconomic status within the City of Mississauga.

At the local environmental scale, participants were able to highlight many more examples of links between the environment and health than they were able to at broader scales. When compared with their discussions of their neighbourhood environment and health, participants' discussions of the Mimico Creek environment and health generally demonstrated a greater personal connection. It is possible that examples given at this scale reflect the importance of place for environmental perceptions, including links to health, whereas, this focus on place was absent from broader scale discussions of the environment and health, and was not as prominent at the level of the neighbourhood.

4.7 Summary

In summary, this chapter has presented results from surveys and focus group sessions conducted with participants from the Malton community. On the survey, participants indicated their 'connectedness' to the natural environment, focused on the Mimico Creek environment and health, and provided brief sociodemographic information. Although it was not the goal of this research to include a representative sample of Malton residents, a diverse group of participants kindly chose to lend their time to this research. A large majority of participants agreed that they consider the natural environment, in general, to be important to their own well-being and that of children. With regard to their neighbourhood environment, most participants indicated that they consider the Mimico Creek to be part of their neighbourhood. Participants indicated that the Mimico Creek is important for both their health and that of children, and also highlighted the importance of the creek for the health of their neighbourhood. However, participants suggested the following measures in order to improve the Mimico Creek and health: cleaning up the creek; prevention of litter and

enforcement of environmental laws; and beautifying the creek area. Notably, these also reflect participants' suggestions from focus group discussions.

This chapter has also presented emergent themes from focus group discussions. There exist many connections between participants' responses on the survey and their discussions during focus group discussions. During focus group sessions, participants discussed the environment and health at a number of scales. Focus group discussions proceeded from larger to smaller scale discussions of the environment and health, beginning with a focus on broad links between the environment and health. Firstly, participants discussed general links between the environment and health, and indicated the importance of protecting the environment in order to protect health. At this scale, participants conceptualized the environment generally, with a focus on environmental components. However, participants gave more specific examples of links between the environment and health, as scale decreased. Secondly, participants examined links between the environment and health at the neighbourhood level. Participants indicated that neighbourhoods can be considered healthy, and identified connections between the environment and health at this level. Participants gave more specific examples of links between the environment and health at this level. In addition, at the neighbourhood level, participants also discussed characteristics of the social environment and the natural environment, in contrast to the exclusive focus on natural environmental components at a broader scale. Thirdly, participants discussed links between the Mimico Creek environment and health in Malton. Participants from all groups indicated that they consider Malton to be a single neighbourhood, with many sociocultural communities, rather than a collection of a number of smaller neighbourhoods. At the local scale, participants gave many specific and detailed examples of links between the environment and health and, specifically, raised issues concerning the Mimico Creek and health the individual and neighbourhood levels. Participants from all focus group sessions identified low environmental health of the Mimico Creek area as a deterrent to use, through the identified connection between environmental health and health at the individual level. Further, participants indicated that the low environmental health of the Mimico Creek serves to compromise the health of their neighbourhood. However, participants identified a number of ways to improve the Mimico Creek in order to improve individual and neighbourhood health in Malton.

Chapter 5: Discussion and Conclusion

5.1 Introduction

This research has explored connections between perceptions of the natural environment and health, at various scales. In particular, this research has explored participants' perceptions of the relationships between the Mimico Creek environment and health at the individual and neighbourhood levels, using surveys and focus group discussions. To summarize, key themes emerged from this research, related to the environment and health at the local level in Malton. For example, participants conceptualized links between the environment and health differently at various scales. While participants discussed general examples of how the environment relates to health at a broad scale, participants were able to give specific examples of how the environment influences their health at the neighbourhood and local levels. For example, when asked about the environment and health at a general (broad) scale, participants discussed environmental components and processes. However, when discussing the environment and health at the neighbourhood level, participants gave examples of indicators of healthy neighbourhoods, and related these to their own neighbourhood of Malton. In addition, when discussing the environment and health at the local scale of the Mimico Creek environment, participants discussed specific links between the environment and health. Participants were more likely to discuss specific environmental problems as scale decreased, that is, as discussion moved from a broad, global scale, to a neighbourhood scale, and to the creek level. This pattern has occurred in the literature (see Burger, 2005), and may reflect participants' more personal and comprehensive knowledge of local-level environments. In general, participants focused on health-compromising features of the natural environment, and on perceptions of the low environmental health of the Mimico Creek area, in particular. Furthermore, participants related their perceptions of low environmental health to use of the Mimico Creek environment, particularly by children. Participants also indicated that they relate the social identity of Malton to the health of the natural environment in their neighbourhood, particularly, that of the Mimico Creek. In addition, participants related perceptions of the Mimico Creek environment to naturalization efforts in the Mimico Creek watershed, though these connections were often not explicit.

Results from this exploratory research provide insight into a diverse Canadian community, and how some of its residents negotiate issues related to the environment and health in their local environment. In addition, these findings can be shown to relate to issues present in the literature, and may be relevant for future research into environments and health at the local and neighbourhood scales. Key themes and significant findings emerging from this research, limitations of this research, and directions for future research are discussed in this chapter.

5.2 Summary and Discussion of Key Themes

Many themes related to the environment and health emerged from focus group sessions with Malton community groups. Key themes are discussed in turn, with a focus on their relevance in the literature, and for future research on the natural environment and health at the local level.

5.2.1 Use of the Mimico Creek Environment

In exploring participants' perceptions of the Mimico Creek environment and health in Malton, this research has explored participants' use of the Mimico Creek, and how this use relates to perceptions of the environment and health. While many connections exist between the natural environment and health, particular influences may depend upon individuals' use of the natural environment. For example, green spaces provide health-enhancing opportunities, vis-à-vis physical and psychological health. Use of the Mimico Creek environment emerged as a key theme in this research. Participants consistently indicated that their use of the Mimico Creek environment is related to their perceptions of both its environmental health, and its effect on their personal health. In addition, participants were able to discuss their use of the creek in order to demonstrate their perceptions of its environmental health and appropriateness for particular activities. During focus group sessions, many participants indicated that they use the Mimico Creek area for recreational physical activity, such as walking. Walking is important for health and may be especially relevant for the health of elderly individuals (Takano et al., 2002). In particular, walking in natural environments affords opportunities for stress reduction (Hartig et al., 2003). Yet,

individuals' use of the natural environment may depend on perceptions of both socioeconomic and biophysical characteristics at the local and neighbourhood levels.

Indeed, individuals' perceptions of their neighbourhood environment have been shown to influence recreational physical activity and walking (Humpel et al., 2004; Giles-Corti and Donovan, 2002). For example, recreational physical activity and walking have been shown to relate to neighbourhood socioeconomic factors[145] (Kavanagh et al., 2005; Giles-Corti and Donovan, 2002), such that residents of neighbourhoods with lower socioeconomic status have been shown to be less likely to perceive their neighbourhood as safe or attractive for activities such as walking (Giles-Corti and Donovan, 2002). Moreover, perceptions of the neighbourhood environments have been shown to influence types of walking, for example, for pleasure or for exercise (Humpel et al., 2004). Thus, socioeconomic factors may influence individuals' recreational physical activity and choice to walk in their neighbourhoods. However, biophysical characteristics of local and neighbourhood environments are also salient for recreational physical activity and walking. In particular, natural and park spaces often provide opportunities for recreational physical activity and walking. As (Krenichyn 2006, p.640) notes:

> Given the importance of physical activity to overall well-being and the low levels of physical activity in many industrialized countries, there is growing recognition of the importance of nearby or everyday outdoor environments. [However] Urban and suburban parks are a missing piece of the current research linking the outdoor environment to physical activity and related health outcomes, and an interdisciplinary approach can help to understand a number of features of parks that relate to physical activity.

Indeed, while research has shown that green spaces are important for urban health, studies have yet to link perceptions of these environments to health in a detailed way. Thus, it is clear that both socioeconomic and biophysical characteristics serve to influence individual recreational physical activity and walking. In this research, participants linked the environmental health of the Mimico Creek area to their use of this natural environment. This relationship may extend from the local level environment of the Mimico Creek to the neighbourhood level in Malton, such that those who perceive the natural environment of their neighbourhood be healthy are more likely to participate in the health-enhancing

[145] For a review of the relationships between characteristics of local level environments and physical activity, see Humpel et al. (2002).

activities, such as recreational physical activity and walking. Indeed, this may indicate an area of future research regarding characteristics of the biophysical environment and health behaviours, such as recreational physical activity.

Furthermore, use of natural environments may be particularly important for the health of children. In this research, participants indicated that the Mimico Creek environment is especially important for the health of children, but raised concerns over environmental health. Play and physical activity are important for children's health, and time spent outdoors has been shown to be a predictor of children's physical activity levels (Sallis et al., 2000). However, greater consideration of social and environmental factors influencing children's play are important for understanding children's physical activity (Veitch et al., 2006; Prezza et al., 2005) and, therefore, health. For example, perceptions of safety and quality of biophysical environments have been shown to influence parents' decisions to allow their children to play outdoors in a given environment (Veitch et al., 2006; Prezza et al., 2005; Valentine and McKendrick, 1997). As such, children's play activities may be restricted due to parents' concerns for the environmental quality and health. In this research, many participants indicated that they do not consider the Mimico Creek environment to be a healthy natural environment for children's use. Indeed, this may have implications for children's health in Malton, and for future research on the urban natural environments and children's health at the local level.

5.2.2 Perceptions of Environmental Health and Social Identity in Malton

In exploring participants' perceptions of the Mimico Creek environment and health in Malton, participants raised issues that connect the environmental health of the Mimico Creek and the social identity of Malton. Participants discussed Malton both as a community, and as a single neighbourhood environment. While it was not the goal of this research to explore the concept of neighbourhood, the issue of defining neighbourhoods did arise when considering Malton as a single neighbourhood. However, it should be noted that the issue of defining what is meant by 'neighbourhood' can be difficult. While the use of administrative boundaries to approximate neighbourhood boundaries is common in the academic literature, these boundaries may not correspond to residents' definitions, or have analytical salience for specific factors related to health (see, for example, Kaplan, 2004; Sampson et al., 2002; Diez

Roux, 2001; Pickett and Pearl, 2001). As such, these boundaries are unlikely to correspond to residents' conceptions of their neighbourhood boundaries. This is relevant when considering residents' perceptions of their neighbourhood environment, as individuals' spatial and social conceptions of 'neighbourhood' will likely reflect a diversity of experience, rather than serve to generate a homogenous definition of neighbourhood for the purposes of analysis. However, when participants were asked about their neighbourhood, it became clear that participants across focus group sessions were discussing Malton, as a whole.

It is interesting that, when asked, all participants indicated that they consider Malton to be one neighbourhood, rather than consisting of a number of smaller neighbourhoods. Participants made it clear that this reasoning is common in Malton, such that, in general, Malton residents consider Malton as its own neighbourhood. As such, when participants referred to their 'neighbourhood,' it can be assumed that they were referring to Malton, as a whole. However, because Malton was considered to be one neighbourhood by participants, opportunities did not exist for the exploration of perceptions across neighbourhoods. As noted, the conception of Malton as a single neighbourhood is likely related to Malton's geographic isolation from other areas of Mississauga, as well as its reputation as an area of low socioeconomic status and high immigration. However, some participants related their perceptions of low environmental health in Malton to its social identity and reputation within the City of Mississauga, indicating that if Malton were an area of higher social status, they would also expect it to be an area of higher environmental quality. This connection between social status and identity and environmental health is noted in the literature (see, for example, Holifield, 2001). Thus, participants' identification of Malton as a neighbourhood is relevant for exploring relationships between the environment and health in Malton, particularly with reference to Malton's social identity. It should be noted that participants were not asked to comment on the connection between environmental health and social identity; rather, this was an emergent theme in focus group sessions. Participants related the environmental health of Malton, in general, and the Mimico Creek area, in particular, to Malton's reputation within Mississauga. Participants (primarily from the LA12 group) related the current low environmental health of the Mimico Creek area to Malton's reputation as the "ghetto" of Mississauga and, furthermore, related potential changes in the

environmental health of the creek to outsiders' perceptions of Malton as a neighbourhood. Nonetheless, participants from across focus group sessions also expressed many positive feelings about Malton, its diverse communities, and its community events.[146] In regard to Mississauga's diversity and natural areas, the City of Mississauga (2002, p.10) notes that "residents of Mississauga have a diverse cultural and educational background and, as such, the attitudes and values with respect to natural areas may be varied from community to community." Indeed, factors such as environmental beliefs and behaviours (Johnson et al., 2004), as well as preferences for the natural environment (Virden and Walker, 1999) have been shown to differ across ethnocultural groups.[147] As such, the social identity of Malton may have implications for future research on the natural environment and health within Malton and the City of Mississauga. In addition, relationships between the natural, sociocultural and socioeconomic environments may be particularly relevant for diverse urban communities, in general. For example, while creek environments, in particular, have been shown to contribute to a sense of well-being among neighbourhood residents, perceptions of creek environments have been shown to vary with socioeconomic factors (Altschuler et al., 2004). In a study of neighbourhood perceptions of a creek environment in the U.S., Altschuler et al. (2004) demonstrate a reflection of this variation. While residents of a neighbourhood of high socioeconomic status welcomed restoration efforts of their particular segment of a neighbourhood creek, residents of a nearby neighbourhood of lower socioeconomic status opposed restoration of their segment, citing concerns for increased crime and deviant behaviour. This example illustrates an interaction between perceptions of the natural environment and socioeconomic characteristics, and their combined influence on perceptions of creek environments and health across neighbourhoods. Indeed, this is an emerging area of research, one which is potentially important for understanding links between the environment and health at the local and neighbourhood levels.

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[146] Indeed, research has shown that this attachment to place may also be linked to well-being. While important for neighbourhood revitalization, place attachment is complex and may be influenced by factors such as age, ethnicity, length of residence, socioeconomic status, and level of pollution (see, for example, Brown et al., 2003; Wakefield et al., 2001; Bonaiuto et al. 1999; see Manzo (2003) for a discussion of emotional attachment to place).

[147] It should be noted that Johnson et al. (2004) and Virden and Walker (1999) are studies conducted in the U.S. However, it may be difficult, or even inappropriate, to extend generalizations from American studies to Canadian neighbourhoods, given differences between ethnocultural groups across countries. However, this point does illustrate the potential for these differences in Canadian neighbourhoods.

5.2.3 Naturalization and Perceptions of the Environment and Health

In exploring participants' perceptions of the Mimico Creek environment and health in Malton, participants often discussed the 'wildness' of the creek, referring to naturalization efforts within the Mimico Creek watershed. It is notable that participants were not explicitly asked about naturalization efforts in the Mimico Creek watershed; rather, this was an emergent theme from focus group sessions. However, since the issue of naturalization was prominent for discussing participants' perceptions of the Mimico Creek environment and health, this topic warrants further exploration in relation to health. This research shows that naturalization efforts are salient for participants' perceptions of the environment and health. Indeed, many participants indicated that naturalization efforts contribute to their perceptions of low environmental health of the Mimico Creek environment. In addition, when the issue of naturalization did arise, it was often not referred to specifically as such; instead, many participants simply focused upon the increasing 'wildness' of the Mimico Creek area. During focus group sessions, participants consistently indicated that they perceive some areas of the Mimico Creek environment to be 'wild' and unscenic. While participants were not asked to identify the location[148] of these areas, these areas are very likely naturalized spaces within the Mimico Creek watershed. In addition, participants—notably, women—linked naturalized spaces with concerns for safety. This can be considered important for health, as factors such as perceived safety have been shown to relate to feelings of neighbourhood belonging (Altschuler et al., 2004) and self rated health, especially for women (Kavanagh et al., 2006). In addition, women's use of the natural environment, in general, and forested spaces (like sections of the Mimico Creek area), in particular, have been shown to be sensitive to perceived safety (Virden and Walker, 1999). Indeed, naturalized areas in the Mimico Creek environment, if perceived to be less accessible, or more 'wild,' may exacerbate concerns for safety among Malton residents. Thus, the 'wildness' of naturalized areas may inadvertently serve to increase to concerns for safety, in spite of efforts to improve the environmental health of these areas.

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[148] It would likely have been useful to show participants photos of the Mimico Creek environment, in order to rate these in terms of perceptions of environmental health and quality (see, for example, Hands and Brown, 2002; Wilson et al., 1995). In particular, photos of naturalized versus 'park-like' spaces would have been useful in order to further examine the relationship between perceptions of the Mimico Creek environment and health, as well as to identify particular areas that may be problematic. This was considered, but ruled out for the sake of time constraints during focus groups. However, it should be noted that the issue of naturalization was itself an emergent theme in this research, and was not anticipated to be a key issue by the author at the time of designing the focus group questions.

As indicated, the City of Mississauga has advocated naturalization efforts in order to promote environmental health. As the Mimico Creek has been identified as a degraded watershed, many areas have undergone naturalization efforts, and indeed, a number of these sites are in Malton. In many cases, the Malton Environmental Stewardship Project is involved in education efforts regarding the natural environment of the Mimico Creek area and naturalized areas along the creek. Yet, while naturalized areas are promoted for their benefits in restoring and safeguarding environmental health in the Mimico Creek watershed, it is clear from this research that the function of these areas may not be well understood by Malton residents. Indeed, the City of Mississauga (2002, p.8) recognizes that "[t]here is a common misconception that naturalized areas are examples of a municipality being negligent in an area's upkeep." However, it is notable that participants were not asked whether they think that naturalization efforts serve to enhance environmental health. Thus, it may be salient to examine perceptions of naturalized areas vis-à-vis the natural environment and health.

While specific links between perceptions of naturalization and health have yet to be adequately explored, the literature does show that individuals often do not perceive naturalized or restorative environments as favourable parts of local environments, in terms of environmental aesthetics. Preferences for 'park-like' versus naturalized areas have been identified by studies on urban nature. Contrast between 'natural' and 'scenic' landscapes have been shown in the literature, and it is scenic landscape preferences which are normally preferred and which, in turn, inform park design (Parsons and Daniel, 2002). Indeed, unruly appearances associated with naturalizing landscapes have been shown to be perceived as unattractive (Breuste, 2004; Hands and Brown, 2002). However, perceptions may differ across individuals or groups. Indeed, as Ozguner and Kendle (2006, p.142) point out:

> People who value formal ornamental landscapes will often see wild areas as untidy, unmaintained or in some other way degraded. For others, the degradation is associated with too much human influence, when an area becomes 'manicured', 'over-formal' or loses its 'naturalness'. Society is diverse and different groups express different attitudes to the natural world.

While, in general, people prefer natural to urbanized environments, all natural environments are not seen to be equally desirable (Parsons and Daniel, 2002). As Parsons and Daniel (2002, p.46) note,

> People prefer fairly open areas with low ground cover, a water source directly (pond, stream) or indirectly (e.g. flowering plants, green vegetation) indicated, occasional clumps of trees and shrubs, with the whole presenting a somewhat complex yet comprehensible scene.

Indeed, the presence of water has been consistently shown to be a valued landscape feature (see, for example, Ozguner and Kendle, 2006; Kaltenborn and Bjerke, 2002; Ulrich, 1981). Perhaps surprisingly, preferences environments for types of natural environments have also been shown to be surprisingly universal, even across ethnocultural categories (Parsons and Daniel, 2002). Thus, residents using parks with naturalized areas, like Wildwood Park in Malton, may understandably view these areas as apart from the general park environment, if they are seen to differ from the traditional park aesthetic. However, attention to perceptions of the natural environment may well benefit urban health at the local and neighbourhood levels. This is indeed an interesting area for future research that relates urban nature to urban health. However, before discussing the significance of this research, some limitations must be addressed.

5.3 Limitations

The qualitative methodological framework used to explore participants' perceptions of the natural environment and health does not allow for population-level generalizations. In addition, the sample size of participants completing the survey does not allow for population-level extrapolation of survey results, even given the quantitative questions on the survey. Thus, findings of this research cannot be generalized to all residents of Malton.

In addition, some practical limitations are relevant to this research. For one, the author's relative inexperience as a focus group moderator may have been a factor in the depth and breadth of data obtained from each session. As well, the socially diversity of the Malton community may have warranted translation of the research tools used in this project into appropriate languages for participants. While participants were required to participate in English-language focus group sessions, and to complete a survey in English, this could have been helped by employing moderators to conduct sessions in other languages, and by the use of translators for the survey. Indeed, conducting research only in English is not ideal for such a diverse community as Malton, and future studies would likely benefit from multilingual

research tools. Thus, including a greater and more diverse sample of the Malton Community would likely benefit future studies on the environment and health in Malton.

Finally, the author's positionality could possibly have influenced recruitment or the functioning of focus group sessions. While it is difficult to determine what influence the researcher's positionality had on the research process, future studies may benefit from co-design with community social groups.

5.4 Discussion and Conclusion

This research has explored participants' perceptions of the environment and health in Malton. This research focuses on the local level environment and health, which reflects the local level emphasis of the Healthy Cities framework and the Mississauga Model. Specifically, this research focuses on the natural environment, which has been identified as playing an important role for Healthy Cities. Of the eleven parameters of a Healthy City (see Hancock, 1993, p.9), the natural environment is given a prominent role in the first and second parameters: "a clean, safe, high quality physical environment" and "an ecosystem which is stable now and sustainable in the long term." Indeed, "[o]ne of the key attributes of any healthy city is regard for the environment and the health of the ecosystems…" (Hancock, 1997, p.8), and, as such, healthy ecosystems are essential for healthy communities (Hancock, 2000). This research, through its focus on perceptions of the natural environment and health in Malton, at the individual and neighbourhood levels, contributes to the Healthy People and Integrated Communities streams of research identified by UTM and the City of Mississauga. With respect to this policy framework, this research was conducted with a community partner, the Malton Environmental Stewardship Project, which reflects the Mississauga Model's emphasis on university-community linkages. Indeed, university and community cooperation is beneficial for community involvement in the research process, and also serves to enhance the success of research within communities.

In this research, participants conceptualized links between the environment and health differently by scale. This finding may be relevant for future research into links between the environment and health at various geographic scales. For example, research into the environment and health at the local and neighbourhood scales, and 'place effects'

research, in particular, may lead to different insights into how the natural environment shapes health than do existing studies at the national or global levels. Indeed, research into place effects on health may do well to expand its focus to aspects of the natural environment, for example, natural or green spaces, such as parks in urban areas, and to include insights from the urban planning and landscape architecture literatures in conceptualizing the role of urban nature in shaping urban health. This research may provide a contribution to the relevant literature in this respect.

The title of this thesis speaks to participants' emphasis on change. In this research, participants voiced a desire to see changes to the natural and social environments within Malton—and an improvement in Malton's relationship with the City of Mississauga, as a whole—in order to improve health in Malton, at the individual and neighbourhood levels. In this research, participants indicated that their use of the natural environment in their neighbourhood is closely related to perceptions of environmental health, and implicitly related to the ways in the environment is related to health. Furthermore, many participants highlighted the importance of improving the local level natural environment, in order to improve health at the individual and neighbourhood levels. Thus, Malton provides both 'a place and space for change,' in the sense that improvements to the natural environment are linked to improvements in the social environment and, in turn, to improvements in health in Malton, as highlighted by participants.

That perceptions of the natural environment and health are linked at the neighbourhood level is likely not surprising; however, the extent to which local level connections between the natural environment and health are considered during the urban planning process is less clear. It is widely accepted that urbanization and urban development often have adverse effects on the health of the natural environment and, furthermore, often serve to reduce available green spaces in urban environments. As discussed, one response to lowered environmental health and the pressures of urbanization is naturalization efforts, usually within existing park environments and along greenways. However, findings from the literature, as well as this research, show that individuals' perceptions of these areas may not be wholly favourable. Indeed, there may exist a conflict between the goal of improving environmental health through naturalization efforts and individuals' perceptions of what constitutes a healthy natural environment. However, since improvements in environmental

health and perceptions of the natural environment are both related to health, the issue of naturalization and environmental perceptions cannot be ignored. As such, examining perceptions of the environment and health may provide useful insights into balancing goals for improvements in the natural environment with improvements in neighbourhood health. While a lack of acceptance of naturalized areas for health may be surprising to advocates of urban nature, this finding warrants further research into how individuals negotiate natural spaces within urban environments. Indeed, this may be relevant for environmental policy. For example, Parsons and Daniel (2002, p.54) argue that:

> Rather than advocating aesthetic 're-education' to advance ecosystem sustainability goals, ecologists and other natural scientists would better serve environmental policy makers by building a scientifically defensible consensus regarding what constitutes ecosystem health. Similarly, psychologists and other social scientists would better serve environmental policy makers by building a scientifically defensible understanding of how and why people adopt environmental concerns and engage in ecologically responsible behaviors.

However, since the topic of naturalization and urban health is relatively unexplored, it is clear that more research is needed to uncover the links between naturalization, environmental health, and neighbourhood health, as well as links to health through environmental perceptions. Interestingly, research has shown that individuals' behaviours towards the environment are influenced by their perceptions of the natural environment as restorative (Hartig et al., 2001). Examining freshwater marshes, Hartig et al. (2001, p.600) showed that individuals' ecological behaviour is related to their interest and fascination with the natural environment, such that "ecological behavior is associated with a perceived potential for restorative experience in a natural environment." Indeed, a greater understanding of links between the natural environment and health—including perceptions of the environment and health and the role of natural spaces—would likely serve to improve health at the local and neighbourhood levels. This research contributes to the literature in this respect. In addition, understanding of the links between urban natural environments and the sociodemographic and socioeconomic fabric of neighbourhoods may prove salient for urban health. It should be noted that, while environmental beliefs have been shown to differ along ethnocultural lines, behaviours such as environmental participation (Johnson et al., 2004) and recreational activity (Virden and Walker, 1999), have also been shown to be sensitive to

ethnocultural factors. In addition, gender is a salient factor for environmental perceptions and use of the natural environment (Virden and Walker, 1999). This may be prove to be relevant for environmental policy, especially that related to urban nature and health. Finally, research has shown that individuals living in urban areas value natural spaces, even if they do not frequently make use of them (Breuste, 2004). Therefore, greater attention to the role of naturalization in park design and urban planning may, in turn, allow for the expansion of health-enhancing features at the local and neighbourhood levels.

Thus, while the body of literature on environments and health is expanding, much research is still required to explore and understand relationships between the natural environment and health at the local and neighbourhood levels, especially in regard to the role that urban nature plays in shaping health. For example, additional research into perceptions of naturalization, urban nature and urban health could be achieved, drawing upon much of the exploratory work on environmental perceptions and values in the environmental psychology literature.[149] In addition, uniting research from (traditionally) separate disciplines would no doubt be helpful in uncovering these relationships, and may benefit communities and individuals in this regard. In particular, linking findings related to naturalization and environmental health with perceptions of the environment and health may serve to better inform urban planning and design vis-à-vis urban nature and health. This is a new area of research which may have the potential for improving urban health.

In conclusion, while this exploratory research focused specifically on the natural environment and health in Malton, and how some of its residents negotiate issues related to the environment and health in their neighbourhood, it can also be seen within a broader research context and, as such, may be relevant for future research into environments and health at the local and neighbourhood scales. This research provides a small addition to this literature, particularly with respect to urban creek environments, and the links between environmental perceptions and issues of social identity and naturalization. The findings of this research both relate to existing areas of focus and suggest future directions for research. Indeed, research on natural environments and health at the local level is a rapidly expanding area of inquiry, reflected in the growing number of quantitative and qualitative studies devoted to uncovering the influence of the natural environment, as place effects, on health.

[149] Using the resources of environmental psychology, links between environmental values, beliefs, or 'connectedness' may also be shown to link to preference for naturalized environments, or to perceptions of naturalized environments and health.

Research related to perceptions of the environment and health is also an integral and growing part of this literature, as the contexts within which individuals negotiate links between the environment and health are also shown to be key considerations for health. Our health is intrinsically linked to that of the environment, such that connections between the environment and health exist with reference to space, place and time, and across geographic scales. Space for environmental change does exist and, in the growing body of literature on local level environments and health, is often conceptualized with reference to place. Growing acceptance and knowledge of the ways in which the environment is related to health is beneficial when respect for the environment and its health-promoting capacity is cultivated and enhanced, through linkages of place and space for change.

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Appendix 1: Information and Consent Documents

[UTM Geography Logo]

INFORMATION LETTER [Pilot Survey]

EXAMINING RESIDENTS' PERCEPTIONS OF THEIR NATURAL ENVIRONMENT AND HEALTH IN MALTON NEIGHBOURHOODS

Dear Madam/Sir:

I am a Master's student in the Department of Geography at the University of Toronto. Working under the supervision of Professor Kathi Wilson, I am conducting a qualitative research study on community perceptions of environment and health in the Malton area as the thesis component of my degree requirements. I am requesting your cooperation as a voluntary participant in this study, which I hope will generate a more in-depth understanding of the relationship between the Mimico Creek area natural environment and health in Malton. This project has received funding by the Social Sciences and Humanities Research Council of Canada and the Centre for Urban Health Initiatives at the University of Toronto.

We are collaborating with the Malton Environmental Stewardship Project (MESP) in this research through contact with Ms. Marnie Branfireun, MESP Project Ecologist and Coordinator. The Malton Environmental Stewardship Project is interested in understanding Malton residents' perceptions of the Mimico Creek natural environment as part of their mandate to create a "Cleaner and Greener Malton". The researchers have no other relationship with the Malton Environmental Stewardship Project, and are not aware of any conflicts of interest.

If you volunteer to participate in this study, we would ask for you to take part in a survey in which you will be asked questions about your views on the natural environment, the Mimico Creek area, as well as your own health and the health of your community. You are under no obligation to answer any specific question. This survey is anonymous and does not ask for your name or contact information.

Although this research will not benefit you directly, by participating in this study you will be contributing to the production of new knowledge about the relationship between the natural environment and health in Malton neighbourhoods. This research will contribute to our understanding of residents' perceptions of the relationship between the Mimico Creek natural environment and health in Malton, and will give us a better understanding of the importance of the Mimico Creek area in Malton. The findings of this research will be shared with the Malton Environmental Stewardship Project.

Your opinions are important to the study, and we hope you will agree to take part. Please feel free to contact me with any questions you may have regarding this study. Professor Kathi Wilson may also be contacted by telephone at 905-828-3864 or by e-mail at kathi.wilson@utoronto.ca.

Yours sincerely,

Elizabeth Noble
Graduate Student, Dept. of Geography, UTM
416-233-6226
elizabeth.noble@utoronto.ca

[UTM Geography Logo]

CONSENT FORM: Participation in Survey Only

EXAMINING RESIDENTS' PERCEPTIONS OF THEIR NATURAL ENVIRONMENT AND HEALTH IN MALTON NEIGHBOURHOODS

I, _____ (please print name), agree to take part in a qualitative study examining residents' perceptions of their natural environment and health in Malton neighbourhoods.

I understand that participation in this research is limited to Malton residents 16 years of age and older. I understand that, as a participant in the study, I will be asked to complete an anonymous survey that contains questions about my views regarding:

- the natural environment;
- the Mimico Creek area;
- my own health and community health;
- socio-demographic information.

I understand that I am under no obligation to agree to participate in this study. Any questions I have asked about the study have been answered to my satisfaction. I understand that my answers to the survey questions are anonymous.

I understand that, although this research will not benefit me directly, by participating in this study I will be contributing to the production of knowledge about the relationship between the natural environment and health in Malton neighbourhoods. I understand that the findings of this study will be shared with our community partner, the Malton Environmental Stewardship Project. The researchers have no other relationship with the Malton Environmental Stewardship Project, and are not aware of any conflicts of interest.

I understand what this study involves and agree to participate. I have been given a copy of this consent form.

_____ _____

Signature Date

[UTM Geography Logo]

INFORMATION LETTER [Focus Groups & Survey]

EXAMINING RESIDENTS' PERCEPTIONS OF THEIR NATURAL ENVIRONMENT AND HEALTH IN MALTON NEIGHBOURHOODS

Dear Madam/Sir:

I am a Master's student in the Department of Geography at the University of Toronto. Working under the supervision of Professor Kathi Wilson, I am conducting a qualitative research study on community perceptions of environment and health in the Malton area as the thesis component of my degree requirements. I am requesting your cooperation as a voluntary participant in this study, which I hope will generate a more in-depth understanding of the relationship between the Mimico Creek area natural environment and health in Malton. This project has received funding by the Social Sciences and Humanities Research Council of Canada and the Centre for Urban Health Initiatives at the University of Toronto.

We are collaborating with the Malton Environmental Stewardship Project (MESP) in this research through contact with Ms. Marnie Branfireun, MESP Project Ecologist and Coordinator. The Malton Environmental Stewardship Project is interested in understanding Malton residents' perceptions of the Mimico Creek natural environment as part of their mandate to create a "Cleaner and Greener Malton". The researchers have no other relationship with the Malton Environmental Stewardship Project, and are not aware of any conflicts of interest.

What is the purpose of the study?

The purpose of the study is to examine residents' perceptions of links between the Mimico Creek environment and health in Malton.

When and where will the study take place?

The study will take place in Malton (Mississauga, ON), during the autumn of 2005.

Who is being asked to take part and what will they do?

As a partner with the Malton Environmental Stewardship Project, we are seeking your participation in a project that examines Malton residents' perceptions of the Mimico Creek natural environment and health in Malton neighbourhoods. We would like to get your views on the Mimico Creek area natural environment and health in your neighbourhood. Participation is limited to Malton residents 16 years of age and older.

If you volunteer to participate in this study, we would ask for you to take part in a focus group interview session lasting about 1 hour. If you choose to participate in a focus group session, you and other focus group participants will be asked questions about your views on the natural environment, the Mimico Creek area, as well as the health of individuals in your community. With your permission, focus group sessions will be taped and transcribed. In addition, focus group participants will be asked to complete a written survey in which you will be asked questions about your views on the natural environment, the Mimico Creek area, as well as your own health and the health of your community. The survey is anonymous and does not ask for your name or contact information.

What are the risks and benefits of the study?

The study has minimal risks. Participation is voluntary and you are under no obligation to answer any specific question, either in a focus group interview session, or on the survey. Although this research will not benefit you directly, by participating in this study you will be contributing to the production of new knowledge about the

relationship between the natural environment and health in Malton neighbourhoods. This research will contribute to our understanding of residents' perceptions of the relationship between the Mimico Creek natural environment and health in Malton, and will give us a better understanding of the importance of the Mimico Creek area to Malton. The findings of this research will be shared with the Malton Environmental Stewardship Project.

Is the study confidential?

The decision to participate or not is voluntary and will be kept completely confidential. Participants can withdraw from the study at any time. The names of participants and their organizations will not be used at any stage of the research. All data will be kept on a secure computer and access to the computer will be secured by use of specific passwords known only to the research team. The completed transcriptions and the audiotapes will be stored in a secure, locked cabinet. No information will be released or printed that would disclose any personal identity. However, confidentiality of the focus group interview session can only be maintained to the extent that participants cooperate with the request to keep proceedings confidential. While you will not be asked questions of a personal nature, we would request that all participants keep any personally sensitive information discussed at the focus group interview session private. The survey is anonymous and responses cannot be traced to participants.

Your opinions are important to the study, and we hope you will agree to take part. Please feel free to contact me with any questions you may have regarding this study. Professor Kathi Wilson may also be contacted by telephone at 905-828-3864 or by e-mail at kathi.wilson@utoronto.ca.

Yours sincerely,

[signed]

Elizabeth Noble
Graduate Student, Dept. of Geography, UTM
416-233-6226
elizabeth.noble@utoronto.ca

[UTM Geography Logo]

CONSENT FORM: Participation in Focus Groups

EXAMINING RESIDENTS' PERCEPTIONS OF THEIR NATURAL ENVIRONMENT AND HEALTH IN MALTON NEIGHBOURHOODS

I, _____ (please print name), agree to take part in a qualitative study examining residents' perceptions of their natural environment and health in Malton neighbourhoods.

I understand that participation in this research is limited to Malton residents 16 years of age and older. I understand that I will participate in a focus group interview session that will ask for my views on the natural environment, the Mimico Creek area, and the health of my community. The focus group session will last around one hour. I understand that with my permission the focus group interview session will be audio-recorded and later transcribed. I am aware that the audiotapes and transcripts will be used only by the research team, and that no other person will have access to them. The audiotapes and transcripts will not have my name or any other identifying information on them. A research code number will be used instead. All data will be kept on a secure computer which will be password protected. Access to the computer will be secured by use of specific passwords known only to the research team. The completed interview schedules, transcriptions, audiotapes and other research data will be stored in a secure, locked cabinet. No information will be released or printed that would disclose any personal identity and all such research data will be destroyed after three years. During focus group interview sessions, all participants will be reminded that the information shared during the session is confidential, and is not to be repeated to those outside of the group. However, there is a limit to the researcher's ability to ensure confidentiality for information shared during these sessions.

I understand that, as a participant in the study, I will also be asked to complete an anonymous survey that contains questions about my views of the natural environment, the Mimico Creek area, my own health and community health and socio-demographic information.

I understand that I am under no obligation to agree to participate in this study. Any questions I have asked about the study have been answered to my satisfaction. I have been assured that no information will be released or printed that would disclose my personal identity. Any risks or benefits that might arise out of my participation have also been explained to my satisfaction. I understand that my decision either to participate or not to participate will be kept completely confidential. There are, however, certain limits to the confidentiality of the information collected in group settings (because, for example, other people may hear what I say). I understand that my answers to the survey questions are anonymous. I further understand that I can withdraw from the study at any time without explanation.

I understand that, although this research will not benefit me directly, by participating in this study I will be contributing to the production of knowledge about the relationship between the natural environment and health in Malton neighbourhoods. I understand that the findings of this study will be shared with our community partner, the Malton Environmental Stewardship Project. The researchers have no other relationship with the Malton Environmental Stewardship Project, and are not aware of any conflicts of interest.

I understand what this study involves and agree to participate. I have been given a copy of this consent form.

_____ _____

Signature Date

[Parental Information Letter & Consent Form]

[UTM Geography Logo]

Monday, October 31, 2005

Dear Parent/Guardian,

I am a Master's student in the Department of Geography at the University of Toronto. Working under the supervision of Professor Kathi Wilson, I am conducting a qualitative research study on community perceptions of the environment and health in Malton, in collaboration with the Malton Environmental Stewardship Project. This letter is to inform you that your child has been invited to participate in a 1-hour focus group session on the topic of the environment and health in Malton. The focus group session will be held during your child's geography class, under the supervision of your child's teacher, for one day in November 2005.

As a participant in a focus group session, your child will be asked to share his/her views on the environment and health in Malton through group discussion and an anonymous survey. This focus group session will be taped and transcribed, in order to ensure accuracy. No sensitive questions will be asked, and your child can choose not to answer any particular question. Data collected will be used only by the researchers, and will be destroyed after the study period. Results will be anonymized, and responses cannot be traced to your child. No information will be released or printed that would disclose your child's name or identity.

This research will contribute to our understanding of perceptions of the environment and health in Malton, specifically the relationship between the Mimico Creek area environment and health. Results of this study will be shared with the Malton Environmental Stewardship Project as part of their goal to create a 'Cleaner and Greener' Malton.

Please feel free to contact me with any questions you may have regarding this study. Professor Kathi Wilson may also be contacted by telephone at 905-828-3864 or by e-mail at kathi.wilson@utoronto.ca.

Yours sincerely,

Elizabeth Noble
Graduate Student, Dept. of Geography, UTM
416-233-6226
elizabeth.noble@utoronto.ca

_ Please detach & return

I, _____, parent/guardian of _____, understand that my child will be participating in a 1-hour focus group session on the topic of the environment and health in Malton. I hereby give permission for my child to participate in this session.

Signed,_____ Date _____

Appendix 2: Survey and Focus Group Questions

[UTM Geography Logo]

Malton Environment and Health Questionnaire

This questionnaire will ask for your views on the environment, health and Mimico Creek. Please answer as many questions as applicable. There are no right or wrong answers.

Connection to the Natural Environment

Using the scale below, please rate the following statements according to how you generally feel. There are no right or wrong answers.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

_____ a. I often feel a sense that I am connected to the natural environment.

_____ b. I often feel that I am only a small part of the natural environment.

_____ c. I often feel disconnected from the natural environment.

_____ d. I often view the natural environment as something threatening.

_____ e. How my actions affect the natural environment is important to me.

_____ f. I view the human community and the natural environment as separate.

_____ g. I feel that my personal well-being is independent of the natural environment around me.

_____ h. I consider the natural environment to be important to my well-being.

_____ i. I consider the natural environment to be important to children's well-being.

_____ j. I have participated in an activity or experience that has made me feel a strong connection with the natural environment in the past 2 years.

_____ k. Having a connection to the natural environment is an important part of my faith or belief system.

The Mimico Creek and Health

1. I consider the Mimico Creek to be part of my neighbourhood.

☐ Yes
☐ No
☐ Undecided

Using the scale below, please answer the following question:

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree

2. The Mimico Creek area is generally a healthy environment for the following:

_____ a. walking

_____ b. walking pets

_____ c. children's play activities

_____ d. picnics

_____ e. other leisure activities

Using the scale below, please answer the following question:

1	2	3	4	5
Not At All Important	Somewhat Unimportant	Neutral	Somewhat Important	Very Important

3. In your view, how important is the environmental health of the Mimico Creek to the following?

_____ a. Protecting human health.

_____ b. Health of other species, e.g., wildlife around the Creek

_____ c. Health of biological communities or ecosystems

Using the scale below, please answer the following question:

1	2	3	4	5
Poor	Fair	Good	Very Good	Excellent

4. Please rate your own health:

_____ a. How would you rate your own health over the past two years, compared to other people your own age?

Using the scale below, please answer the following question:

1	2	3	4	5
Not At All Important	Somewhat Unimportant	Neutral	Somewhat Important	Very Important

5. Please indicate how important the Mimico Creek is for improving the following:

_____ a. Your physical health.

_____ b. Your emotional well-being.

_____ c. The health of individuals in your neighbourhood.

_____ d. Health of your neighbourhood.

_____ e. The health of children in your neighbourhood.

_____ f. The health of pets in your neighbourhood.

6. Do you think that having the Mimico Creek in your neighbourhood makes you healthier than residents who live farther away from a creek or river area? *(Please indicate 'NA' if you do not consider Mimico Creek to be part of your neighbourhood.)*

☐ Yes, a positive effect on health
☐ No, a negative effect on health
☐ No effect on health
☐ I don't know
☐ Not applicable

7. Do you think that having the Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city? *(Please indicate 'NA' if you do not consider Mimico Creek to be part of your neighbourhood.)*

☐ Yes, a positive effect on health
☐ No, a negative effect on health
☐ No effect on health
☐ I don't know
☐ Not applicable

8. Please list up to 3 things about Mimico Creek that need to be improved in order to maintain or improve your health.

1. _____
2. _____
3. _____

Please Tell Us More About You

Please check one of the boxes for each of the questions below.

1. My gender is: ☐ Female ☐ Male

2. My age is:

16-17	18-20	21-24	25-29	30-39	40-49	50-59	59-64	65 +

3. My postal code is: _____

4. I have lived in Malton for: _____Years _____Months

5. I have lived in Canada for: _____Years _____Months

6. Please list your country of birth: _____

7. To what ethnic or cultural group did your ancestors belong?
_____

8. To which ethnic or cultural group(s) do you most identify with?
_____

9. Please identify your faith or belief system: _____

10. Approximately how much income did you and all other members of your household receive in the year 2004? Please check the appropriate box.

☐ less than 20,000
☐ 20,000 to 29,999
☐ 30,000 to 39,999
☐ 40,000 to 49,999
☐ 50,000 to 59,999
☐ 60,000 to 69,999
☐ 70,000 to 79,999
☐ 80,000 to 89,999
☐ 90,000 to 99,999
☐ 100,000 or more

Thank you for taking the time to participate in this research!
Your input is valuable to us.

[UTM – Geography logo]

Malton Environment and Health

Focus Group Questions

Environment

1. How would you define “environment”? [The ‘natural’ environment?]

2. Does the natural environment influence your health? [If so, how? How does the environment compare with other influences on your health?]

3. Do you feel that protecting the environment is related to protecting your health? [If so, how?]

Neighbourhood

4. Is it possible for a neighbourhood to be considered healthy? If neighbourhoods can be healthy, what shapes the health of a neighbourhood?

5. Do you think that the environment in your neighbourhood influences your health? [If so, how?]

Mimico Creek

6. Do you consider the Mimico Creek and surrounding greenspace area to be an important feature of your neighbourhood? [Why? Why not?]

7. Do you ever use the Mimico Creek or surrounding greenspace area? [How? How often?]

8. Is using the Mimico Creek area an important part of your faith or belief system?

9. Do you feel that the Mimico Creek or surrounding greenspace area influences *your* health in any way? [If so, how? What aspects are of benefit to your health? Are there any aspects that you consider to pose a risk to your health?]

10. Do you consider the Mimico Creek or greenspace area to be important for the health of *your neighbourhood*? If so, in what way(s)?

11. If you could change one thing about the Mimico Creek area that would improve your health what would it be? [unrelated example, e.g., access to healthy food; transit accessibility, etc.]

Appendix 3: Survey Results

A. FREQUENCIES

Section: Connection to the Natural Environment

1a. Feel a sense of connection to natural environment

N	**Valid**	56
	Missing	15

	Frequency	Valid Percent
Disagree	10	18.2%
Neutral	20	36.4%
Agree	25	45.5%
Missing	16	
Total	71	100.00%

1b. Often feel that I am only a small part of the natural environment

N	**Valid**	55
	Missing	16

		Frequency	Valid Percent
Valid	Disagree	12	21.4%
	Neutral	19	33.9%
	Agree	25	44.6%
	Missing	15	
	Total	71	100.00%

1c. Often feel disconnected from natural environment

N	**Valid**	56
	Missing	15

	Frequency	Valid Percent
Disagree	29	51.8%
Neutral	17	30.4%
Agree	10	17.9%
Missing	15	
Total	71	100.00%

1d. View natural environment as something threatening

N	**Valid**	56
	Missing	15

	Frequency	**Valid Percent**
Disagree	34	60.7%
Neutral	11	19.6%
Agree	11	19.6%
Missing	15	
Total	71	100.00%

1e. How my actions affect the natural environment is important to me

N	**Valid**	56
	Missing	15

	Frequency	**Valid Percent**
Disagree	8	14.3%
Neutral	14	25.0%
Agree	34	60.7%
Missing	15	
Total	71	100.00%

1f. View the human community and the natural environment as separate

N	**Valid**	56
	Missing	15

	Frequency	**Valid Percent**
Disagree	32	57.1%
Neutral	11	19.6%
Agree	13	23.2%
Missing	15	
Total	71	100.00%

1g. Feel that my personal well-being is independent of the natural environment around me

N	**Valid**	55
	Missing	16

	Frequency	**Valid Percent**
Disagree	28	50.9%
Neutral	7	12.7%
Agree	20	36.4%
Missing	16	
Total	71	100.00%

1h. Consider the natural environment to be important to my well-being

N	**Valid**	56
	Missing	15

	Frequency	**Valid Percent**
Disagree	3	5.4%
Neutral	6	10.7%
Agree	47	83.9%
Missing	15	
Total	71	100.00%

1i. Consider the natural environment to be important to children's well-being

N	**Valid**	56
	Missing	15

	Frequency	**Valid Percent**
Disagree	3	5.4%
Neutral	6	10.7%
Agree	47	83.9%
Missing	15	
Total	71	100.00%

1j. Have participated in an activity/experience that has made me feel strong connection with natural environment in the past two years

N	**Valid**	55
	Missing	16

	Frequency	**Valid Percent**
Disagree	12	21.8%
Neutral	22	40.0%
Agree	21	38.2%
Missing	16	
Total	71	100.00%

Section: The Mimico Creek and Health

1. Consider Mimico Creek part of my neighbourhood

N	**Valid**	55
	Missing	16

		Frequency	Valid Percent
Valid	Yes	40	72.7%
	No	6	10.9%
	Undecided	9	16.4%
	Missing	16	
	Total	71	100.00%

2a. The Mimico Creek area is generally a healthy environment for: walking

N	**Valid**	53
	Missing	18

		Frequency	Valid Percent
Valid	Disagree	13	24.5%
	Neutral	7	13.2%
	Agree	33	62.3%
	Missing	18	
	Total	71	100.00%

2b. The Mimico Creek area is generally a healthy environment for: walking pets

N	**Valid**	53
	Missing	18

		Frequency	Valid Percent
Valid	Disagree	15	28.3%
	Neutral	8	15.1%
	Agree	30	56.6%
	Missing	18	
	Total	71	100.00%

2c. The Mimico Creek area is generally a healthy environment for: children's play activities

N	**Valid**	53
	Missing	18

		Frequency	Valid Percent
Valid	Disagree	33	62.3%
	Neutral	4	7.5%
	Agree	16	30.2%
	Missing	18	
	Total	71	100.00%

2d. The Mimico Creek area is generally a healthy environment for: picnics

N	**Valid**	53
	Missing	18

		Frequency	Valid Percent
Valid	Disagree	33	62.3%
	Neutral	9	17.0%
	Agree	11	20.8%
	Missing	18	
	Total	53	100.00%

2e. The Mimico Creek area is generally a health environment for: other leisure activities

N	**Valid**	52
	Missing	19

		Frequency	Valid Percent
Valid	Disagree	21	40.4%
	Neutral	16	30.8%
	Agree	15	28.8%
	Missing	19	
	Total	52	100.00%

3a. In your view, how important is the environmental health of the Mimico Creek to: Protecting human health?

N	**Valid**	56
	Missing	15

		Frequency	Valid Percent
Valid	Unimportant	3	5.4%
	Neutral	9	16.1%
	Important	44	78.6%
	Missing	15	
	Total	56	100.00%

3b. In your view, how important is the environmental health of the Mimico Creek to: health of others species (e.g. Wildlife around the Creek)

N	**Valid**	56
	Missing	15

		Frequency	Valid Percent
Valid	Unimportant	2	3.6%
	Neutral	11	19.6%
	Important	43	76.8%
	Missing	15	
	Total	56	100.00%

3c. In your view, how important is the environmental health of the Mimico Creek to: health of biological communities or ecosystems

N	**Valid**	55
	Missing	16

		Frequency	**Valid Percent**
Valid	Unimportant	4	7.3%
	Neutral	9	16.4%
	Important	42	76.4%
	Missing	16	
	Total	55	100.00%

4a. Rate your own health over the past two years, compared to other people your own age?

N	**Valid**	56
	Missing	15

		Frequency	**Valid Percent**
Valid	Poor/Fair	10	17.9%
	Excellent/V.Good/Good	46	82.1%
	Missing	15	
	Total	56	100.00%

5a. Please indicate how important Mimico Creek is for improving: your physical health

N	**Valid**	57
	Missing	14

		Frequency	**Valid Percent**
Valid	Unimportant	15	26.3%
	Neutral	11	19.3%
	Important	31	54.4%
	Missing	14	
	Total	57	100.00%

5b. Please indicate how important Mimico Creek is for improving: your emotional well-being

N	**Valid**	56
	Missing	15

		Frequency	**Valid Percent**
Valid	Unimportant	18	32.1%
	Neutral	11	19.6%
	Important	27	48.2%
	Missing	15	
	Total	56	1000.00%

5c. Please indicate how important Mimico Creek is for improving: the health of individuals in your neighbourhood

N	**Valid**	57
	Missing	14

		Frequency	Valid Percent
Valid	Unimportant	6	10.5%
	Neutral	15	26.3%
	Important	36	63.2%
	Missing	14	
	Total	57	100.00%

5d. Please indicate how important Mimico Creek is for improving: health of your neighbourhood

N	**Valid**	57
	Missing	14

		Frequency	Valid Percent
Valid	Unimportant	5	8.8%
	Neutral	12	21.1%
	Important	40	70.2%
	Missing	14	
	Total	57	100.00%

5e.Please indicate how important Mimico Creek is for improving: the health of children in your neighbourhood

N	**Valid**	56
	Missing	15

		Frequency	Valid Percent
Valid	Unimportant	5	8.9%
	Neutral	9	16.1%
	Important	42	75.0%
	Missing	15	
	Total	56	100.00%

5f. Please indicate how important Mimico Creek is for improving: the health of pets in your neighbourhood

N	**Valid**	57
	Missing	14

		Frequency	Valid Percent
Valid	Unimportant	2	3.5%
	Neutral	17	29.8%
	Important	38	66.7%
	Missing	14	
	Total	57	100.00%

6. Do you think that having Mimico Creek in your neighbourhood makes you healthier than residents who live farther away from a creek or river area?

N	**Valid**	56
	Missing	15

		Frequency	Valid Percent
Valid	Positive Effect	20	35.7%
	No Effect	7	7.1%
	Negative Effect	4	12.5%
	Don't Know	23	41.1%
	Not Applicable	2	3.6%
	Total	71	100.00%

7. Do you think that having Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city?

N	**Valid**	56
	Missing	15

		Frequency	Valid Percent
Valid	Positive Effect	20	35.7%
	No Effect	6	7.1%
	Negative Effect	4	10.7%
	Don't Know	23	41.1%
	Not Applicable	3	5.4%
	Total	71	100.00%

8. Please mention something about Mimico Creek that needs improvement (1st mention only considered)

N	**Valid**	52
	Missing	19

		Frequency	**Valid Percent**
Valid	Clean Up Creek	33	63.5%
	Prevention and Enforcement	11	21.2%
	Beautify Creek Area	3	5.8%
	Other	5	9.6%
	Missing	19	
	Total	71	100.00%

Section: Please Tell Us More About You

1. Gender

N	**Valid**	70
	Missing	1

		Frequency	Valid Percent
Valid	Male	31	55.7%
	Female	39	44.3%
	Missing	1	
	Total	71	100.00%

2. Age

N	**Valid**	70
	Missing	1

Age	Frequency	Percent	Valid Percent
16-17	30	42.2%	42.8%
18-20	7	9.9%	10.0%
21-24	6	8.5%	8.6%
25-29	2	2.8%	2.9%
30-39	4	5.6%	5.7%
40-49	3	4.2%	4.3%
50-59	3	4.2%	4.3%
59-64	6	8.5%	8.6%
65+	9	12.7%	12.9%
Missing	1	1.4%	
Total	71	100.00%	100.00%

4. Live in Malton for Average of:
10.5662 Years

		Frequency	Valid Percent
Valid	**Less than 1 year**	4	5.6%
	1 to 4.9 years	21	29.6%
	5 to 9 years	10	14.1%
	10 to 19 years	21	29.6%
	20 + years	15	21.1%
	Total	71	100%

5. Lived in Canada for Average of:
16.2265 Years

		Frequency	Valid Percent
Valid	**Less than 1 year**	5	7.0%
	1 to 4.9 years	22	31.0%
	5 to 9 years	17	23.9%
	10 to 19 years	17	23.9%
	20 to 39 years	8	11.3%
	40 + Years	2	2.8%
	Total	71	100%

6. Country of Birth:

N	**Valid**	68
	Missing	3

	Frequency	Valid Percent
Canada	14	20.6%
England	1	1.5%
Barbados	1	1.5%
Scotland	1	1.5%
Ireland	1	1.5%
Guyana	4	5.9%
Ghana	4	5.9%
Jamaica	9	13.2%
Switzerland	1	1.5%
The Netherlands	2	2.9%
India	18	26.5%
Pakistan	3	4.4%
Libya	1	1.5%
Sri Lanka	1	1.5%
Trinidad and Tobago	2	2.9%
Iraq	1	1.5%
Syria	1	1.5%
Columbia	2	2.9%
Poland	1	1.5%
Total	68	100.00%

7. To what cultural group did your ancestors belong?

N Valid	63
Missing	8

	Frequency	Valid Percent
Scottish	3	4.8%
English	3	4.8%
Barbadian	1	1.6%
Irish	1	1.6%
East-Indian	4	6.3%
Ghanaians	2	3.2%
Jamaican	3	4.8%
Indian	14	22.2%
European	1	1.6%
Dutch	1	1.6%
Vietnamese	1	1.6%
Sikh	6	9.5%
Pakistani	3	4.8%
Sri Lankan	1	1.6%
French	1	1.6%
African	4	6.3%
Punjabi-Sikh	6	9.5%
Syrian	1	1.6%
Spanish	2	3.2%
Polish	1	1.6%
Black	2	3.2%
Afro-West-Indian	1	1.6%
Mixed	1	1.6%
Total	71	100.00%

8. To which ethnic or cultural group do you most identify?

N	**Valid**	58
	Missing	13

	Frequency	Valid Percent
Canadian	9	15.5%
British	1	1.7%
Black	4	6.9%
Dutch	1	1.7%
Irish	1	1.7%
East-Indian	2	3.4%
Ghanaians	1	1.7%
Indian	6	10.3%
Sikh	9	15.5%
Guyanese	2	3.4%
Pakistani	2	3.4%
Jamaican	3	5.2%
Sri-Lankan	1	1.7%
Trinidadian	1	1.7%
African	2	3.4%
French Canadian	1	1.7%
West-Indian	1	1.7%
Afro-Canadian	2	3.4%
Asian	1	1.7%
Punjabi-Sikh	3	5.2%
South Asian	1	1.7%
Syrian	1	1.7%
Latin American	2	3.4%
European	1	1.7%
Total	58	100.00%

10. Approximate Household Income

N	**Valid**	23
	Missing	48

		Frequency	Valid Percent
Valid	Less than $20,.000	4	17.4%
	$20,000 to $29,999	7	30.4%
	$30,000 to $39,999	2	8.7%
	$40,000 to $49,999	0	0.0%
	$50,000 to $59,999	3	13.0%
	$60,000 to $69,999	0	0.0%
	$70,000 to $79,999	4	17.4%
	$80,000 to $89,999	1	4.3%
	$90,000 to $99,999	1	4.3%
	$100 or more	1	4.3%
	Total	48	100.00%

B. CNE INDEX

Frequencies – CNE Index

		Frequency	Valid Percent
Valid	.00	2	3.57%
	1.00	1	1.79%
	2.00	2	3.57%
	4.00	5	8.93%
	5.00	6	10.71%
	6.00	7	12.50%
	7.00	7	12.50%
	8.00	5	8.93%
	9.00	5	8.93%
	10.00	2	3.57%
	11.00	3	5.38%
	12.00	5	8.93%
	13.00	3	5.38%
	14.00	1	1.79%
	16.00	2	3.57%
	Total	56	100.0

Alpha Index .514

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
cneind2	56	.00	16.00	**7.6607**	3.74300
Valid N (listwise)	56				

		Frequency	Valid Percent
Valid	**Below Mean**	30	53.6
	Above Mean	26	46.4
	Total	56	100.0

INDEX * Section: The Mimico Creek Environment and Health

1. CNE * Mimico Creek is a healthy environment for walking: **not significant**
2. CNE * Mimico Creek is a healthy environment for walking pets: **not significant**
3. CNE * Mimico Creek is a healthy environment for children's play activities: **not significant**
4. CNE * Mimico Creek is a healthy environment for picnics: **not significant**

5. Recoded Above and Below Mean * Other Leisure Activities

			Other Leisure Activities		
			Disagree	Neutral	Agree
Recoded to above and below mean	Below Mean	%	37.0%	44.4%	18.5%
	Above Mean	%	44.0%	16.0%	40.0%

Chi Square = p<0.059

6. CNE * Environmental Health of Mimico Creek for protecting human health: **not significant**
7. CNE * Environmental Health of Mimico Creek for health of other species: **not significant**

8. Recoded Above and Below Mean * Health of Biological Community

			Health of Other Biological Community		
			Unimportant	Neutral	Important
Recoded to above and below mean	Below Mean	%	6.7%	26.7%	66.7%
	Above Mean	%	8.0%	4.0%	88.0%

Chi Square = p<0.077

9. Recoded Above and Below Mean * Your Physical Health

			Your Physical Health		
			Unimportant	Neutral	Important
Recoded to above and below mean	Below Mean	%	26.7%	30.0%	43.3%
	Above Mean	%	26.9%	7.7%	65.4%

Chi Square = p<0.091

10. CNE * Mimico Creek for improving the following: emotional well-being: **not significant**

11. Recoded Above and Below Mean * Health of Individuals in your Neighbourhood

			Health of Individuals in your Neighbourhood		
			Unimportant	Neutral	Important
Recoded to above and below mean	Below Mean	%	13.3%	40.0%	46.7%
	Above Mean	%	7.7%	11.5%	60.0%

Chi Square = p<0.027

12. CNE * Mimico Creek for improving the following: health of neighbourhood: **not significant**

13. Recoded Above and Below Mean * Health of Children in your Neighbourhood

			Health of children in your Neighbourhood		
			Unimportant	Neutral	Important
Recoded to above and below mean	Below Mean	%	17.2%	13.8%	69.0%
	Above Mean	%	0%	19.2%	80.8%

Chi Square = p<0.083

14. CNE* Rate your own health: **not significant**

15. Recoded Above and Below Mean * Having Mimico Creek in area makes you healthier than residents who live farther away from creek or river area

			Having Mimico Creek in area makes you healthier than residents who live farther away from creek or river area		
			Yes, a positive effect on health	No, a negative effect on health	No effect on health
Recoded to above and below mean	Below Mean	%	53.3%	20.0%	26.7%
	Above Mean	%	73.3%	26.7%	0%

Chi Square = p<0.099

16. Recoded Above and Below Mean * Having Mimico Creek in area makes you healthier than residents who live in other parts of the city

			Having Mimico Creek in area makes you healthier than residents who live in other parts of the city		
			Yes, a positive effect on health	No, a negative effect on health	No effect on health
Recoded to above and below mean	Below Mean	%	60.0%	13.3%	26.7%
	Above Mean	%	71.4%	28.6%	0%

Chi Square = p<0.096

INDEX * Section: Sociodemographic Characteristics

Recoded Above and Below Mean * Age

			Age Recoded				
			14-17	18-29	30-49	50-64	65+
Recoded to above or below mean	Below Mean	%	66.7%	13.3%	3.3%	13.3%	3.3%
	Above Mean	%	40.0%	8.0%	8.0%	16.0%	28.0%

Chi Square = p<0.076

Recoded to above or below mean (index) * Gender

			Gender	
			Female	Male
Recoded into above or below mean	Below Mean	%	53.3%	46.7%
	Above mean	%	48.0%	52.0%

Chi Square = p<0.694

Recoded Above and Below Mean * Household Income

			Income		
			Less than $20,000-$49,999	$50,000-$99,999	$100,000 and over
Recoded to above and below mean	Below Mean	%	25.0%	75.0%	0%
	Above Mean	%	40.0%	50.0%	10.0%

Chi Square = p<0.640

Recoded Above and Below Mean * Years in Canada

			Years in Canada				
			1-4.9 Years	5-9 Years	10-19 Years	20-39 Years	40+ Years
Recoded to above and below mean	Below Mean	%	26.7%	30.0%	36.7%	6.7%	0%
	Above Mean	%	19.2%	26.9%	23.1%	23.1%	7.7%

Chi Square = p<0.188

Recoded Above and Below Mean * Years in Malton

			Years in Malton			
			1-4.9 Years	5-9 Years	10-19 Years	20+ Years
Recoded to above and below mean	Below Mean	%	26.7%	13.3%	46.7%	13.3%
	Above Mean	%	7.7%	23.1%	26.9%	42.3%

Chi Square = p<0.025

C. ADDITIONAL CROSS-TABS

Feel Sense that One is Connected to Natural Environment* How Important Mimico Creek is to the following:

How Important Mimico Creek Is To:			Feel Sense That One is Connected to Natural Environment		
			Disagree	Neutral	Agree
Your Physical Health:	Unimportant	%	40.0%	30.0%	20.0%
	Neutral	%	20.0%	30.0%	12.0%
	Important	%	40.0%	40.0%	68.0%
Your Emotional Well-Being	Unimportant	%	40.0%	60.0%	8.0%
	Neutral	%	10.0%	20.0%	20.0%
	Important	%	50.0%	20.0%	72.0%
The Health of Individuals in your Neighbourhood	Unimportant	%	20.0%	10.0%	8.0%
	Neutral	%	20.0%	45.0%	16.0%
	Important	%	60.0%	45.0%	76.0%
Health of your Neighbourhood	Unimportant	%	20.0%	10.0%	4.0%
	Neutral	%	20.0%	40.0%	8.0%
	Important	%	60.0%	50.0%	88.0%
The Health of Children in your Neighbourhood	Unimportant	%	20.0%	10.0%	4.2%
	Neutral	%	10.0%	30.0%	8.3%
	Important	%	70.0%	60.0%	87.5%
The Health of Pets in your Neighbourhood	Unimportant	%	0%	10.0%	0%
	Neutral	%	30.0%	35.0%	28.0%
	Important	%	70.0%	55.0%	72.0%

1. Physical Health: Chi Square = p<0.291
2. Well Being: Chi Square = p<0.003
3. Health of Individuals in Your Neighbourhood: Chi Square = p<0.174
4. Health of your Neighbourhood: Chi Square = p<0.045
5. Health of Children in your Neighbourhood : Chi Square = p<0.167
6. Health of Pets in your Neighbourhood: Chi Square = p<0.379

Do you think that having Mimico Creek in your neighbourhood makes you healthier than residents who live farther away from a creek or river area* Consider Natural Environment to be Important to Well-Being

			Do you think having the Mimico Creek in your neighbourhood makes you healthier than residents who live farther away from a creek or river area?		
			Yes, Positive Effect on Health	No, Negative Effect on Health	No Effect on Health
Consider Natural Environment to be Important to Well Being	Disagree	%	5.3%	0.0%	25.0%
	Neutral	%	5.3%	0.0%	0.0%
	Agree	%	89.5%	100.0%	75.0%

Chi Square = p<0.509

Do you think that having Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city* Consider natural environment to be important to well-being

			Do you think having the Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city?		
			Yes, Positive Effect on Health	No, Negative Effect on Health	No Effect on Health
Consider Natural Environment to be Important Well Being	Disagree	%	5.3%	0.0%	0.0%
	Neutral	%	5.3%	0.0%	25.0%
	Agree	%	89.5%	100.0%	75.0%

Chi Square = p<0.544

The Mimico Creek is generally a healthy environment for the following: children's play activities* Consider natural environment to be important to children's well-being

			The Mimico Creek is generally a healthy environment for the following: children's play activities		
			Disagree	Neutral	Agree
Consider Natural Environment to be important to children's well-being	Disagree	%	9.1%	0.0%	0.0%
	Neutral	%	9.1%	0.0%	18.8%
	Agree	%	81.8%	100.0%	81.3%

Chi Square = p<0.502

How important the Mimico Creek is for improving the following: health of children in your neighbourhood* Consider natural environment to be important to children's well-being

			How important the Mimico Creek is for improving the following: the health of children in your neighbourhood		
			Unimportant	Neutral	Important
Consider Natural Environment to be important to children's well-being	Disagree	%	20.0%	0.0%	4.9%
	Neutral	%	0.0%	22.2%	9.8%
	Agree	%	80.0%	77.8%	85.4%

Chi Square = p<0.384

Do you think that having Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city* Gender

			Do you think having the Mimico Creek in your neighbourhood makes your neighbourhood healthier than neighbourhoods in other parts of the city?		
			Yes, Positive Effect on Health	No, Negative Effect on Health	No Effect on Health
Gender	Female	%	50.0%	60.0%	25.0%
	Male	%	50.0%	40.0%	75.0%

Chi Square = p<0.558

Do you think that having Mimico Creek in your neighbourhood makes you healthier than residents who live farther away from a creek or river area* Gender

			Do you think having the Mimico Creek in your neighbourhood makes you healthier than residents who live farther away from a creek or river area?		
			Yes, Positive Effect on Health	No, Negative Effect on Health	No Effect on Health
Gender	Female	%	42.1%	57.1%	25.0%
	Male	%	57.9%	42.9%	75.0%

Chi Square = p<0.576