SOCIAL CAPITAL AND ENVIRONMENTAL RISK:

UNDERSTANDING RESPONSES TO ADVERSE AIR QUALITY IN HAMILTON-WENTWORTH

By

SARAH WAKEFIELD, M.A.

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SOCIAL CAPITAL AND ENVIRONMENTAL RISK

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AUTHOR: Sarah Wakefield, B.A. (Carleton University), M.A. (McMaster University)

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ABSTRACT

This thesis investigates civic action around environmental concerns, using the issue of air quality in Hamilton, Ontario, as a case study. There is growing emphasis in the literature on citizen participation in environmental and health policy. However, our understanding of the factors which motivate or hinder citizen action around local environmental issues is at best limited, particularly with respect to the roles of social context and social capital in facilitating collective action. This research focusses on the need to better understand environmental action-taking by: documenting intra-urban variation in air quality perception, concern, and action in the City of Hamilton; identifying factors related to both predisposition and capacity to take action around air quality; and exploring how these factors, particularly social capital, influence the relationship between environmental risk perception, concern, and action. A combination of qualitative and quantitative methods were used in this research. In-depth interviews (n=21) conducted with residents of an area experiencing poor air quality illustrated the specificity of lay understandings and concerns about exposure to air pollution, and indicated that social capital played a central role in the development of civic environmental action. A quantitative survey,

administered to a random sample of households in Hamilton (n=512, stratified by area of residence), investigated environmental perception and concern, individual and social network characteristics, and environmental action. Results indicated that, while variation between areas was observed in terms of aggregate individual characteristics and perceived exposure to air pollution, little geographic variation in social network characteristics, air pollution concern, or environmental action was observed. Predictors of a variety of environmental actions were identified through logistic regression, and results suggested substantial differences between types of action. Further, factors related to social networks generally played a larger role in environmental action-taking than socio-demographic factors.

ACKNOWLEDGMENTS

My hope is that everyone who deserves thanks for this thesis will receive a special, in-person thank you from me. This includes just about everyone I know, but especially my committee, my mentors here and abroad, my family, my friends, Colin, and anyone who helped with the administrative processes of research over the years (these categories are not mutually exclusive!). If I have forgotten anyone, I hope you know me well enough to know that I am forgetful but not (I hope) self-important, and will take me to task for it!

PREFACE

STUDENT'S CONTRIBUTION TO THE PAPERS IN THIS THESIS

For all papers included in this thesis, Sarah Wakefield devised the research instruments (both qualitative and quantitative), analyzed data presented in the papers, and wrote the papers. Sarah conducted all the in-depth interviews (the results of which are presented in Chapter 2), and supervised the administration of the survey (results of which are presented in Chapters 3 and 4). In all cases, the additional authors on the papers adopted a supervisory role, providing suggestions on the research directions, data collection and analysis techniques, and providing comments on paper drafts. Susan Elliott, as the primary thesis supervisor, provided significant editorial assistance in paper development.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Within health geography and health research more generally, there has been a growing emphasis on the influence of social and environmental inequality on human health (Hayes, 1999). In addition, researchers have increasingly expressed interest in questions related to the role of citizen participation in addressing these inequities, particularly in relation to environmental health concerns (Petersen and Lupton, 1996; Harvey, 1996). However, understanding of what motivates individuals to participate in civic action around environmental issues is limited. In particular, little is known about the role of social capital in facilitating environmental action. Social capital has been defined by Putnam (1995, 67) as the "features of social organization such as networks, norms, and social trust that facilitate co-ordination and co-operation for mutual benefit". This concept has been the subject of increasing interest, both within geography and elsewhere: however, the precise role and relative contribution of social capital in facilitating collective action remain opaque (Fukuyama,2000; Popay, 2000). This dissertation addressed the need to better understand the role of social capital in individual and collective action by

examining these issues in the context of an environmental risk - adverse air quality - using the urban industrial community of Hamilton, Ontario, Canada as a case study (Figure 1).

The objectives of this research, therefore, were:

i) to document intra-urban variation in air quality perception, concern, and action in the City of Hamilton;

ii) to identify factors which **predispose** individuals to take action around air quality;

ii) to identify factors affecting individual and community **capacity** to take action around air quality; and,

iv) to explore how these factors, particularly **social capital**, influence relationships between environmental risk perception, concern, and action.

1.2 HEALTH, SOCIAL CAPITAL, AND ENVIRONMENTAL ACTION

Within medical geography, health is often conceptualized as "the ability of individuals to work together to cope with, manage and change their environment" (WHO, 1986). Under this broad definition, individuals' health could be influenced (both positively and negatively) by characteristics of the community in which they live, since place and community can shape individuals' understandings of themselves and their interrelationships (Marcuse, 1989, in McDowell, 1997; Hummon, 1990). As Wilkinson (1996) notes, the quality of social relations, connections to and involvement in public life, and perceptions of subjective (not material) reality are prime determinants of well-being:

> ...to feel depressed, cheated, bitter, desperate, vulnerable, frightened, angry, worried..., devalued, useless, helpless, uncared for, hopeless, isolated, anxious and a failure: these feelings can dominate people's whole experience of life, colouring their experience of everything else. It is the chronic stress arising from feelings like these which does the damage. It is the social feelings which matter, not exposure to a supposedly toxic material environment. The material environment is merely the indelible mark and constant reminder of one's failure, of the atrophy of any sense of having a place in a community, and of one's social exclusion and devaluation as a human being. (215)

While this statement may represent an extreme view, it highlights the importance of neighbourhoods and communities as sources of self-affirmation or self-denigration, depending on their location and social characteristics (McDowell, 1997; Eyles, 1985).

In this context, the presence of social capital in a community may be an important component of health and well-being. The ability to participate meaningfully in societal processes (as mediated by social capital) is considered central to individual well-being in much recent literature (Hayes, 1999; Wilkinson, 1996). In addition, social capital is thought to provide numerous benefits to communities, including the facilitation of successful action to solve neighbourhood problems (Putnam, 1995; Ife, 1995; Heiman, 1997). However, the relationship between social capital and collective action for environmental health has not been explored in any depth empirically.

Collective action around environmental issues can be thought of as one component of a broader set of environmental actions (including activities such as

recycling as well as participation in environmental groups). Environmental action can be defined (as in Stern, 2000) as behavior undertaken to benefit the environment. Environmental action is of growing importance to policy-makers as public participation in environmental management becomes widespread (Harvey, 1996; Northridge and Shepard, 1995). Not surprisingly, then, numerous investigations of environmental action can be found in the literature (e.g., Greenberg and Schneider, 1997; Nevitte and Kanji, 1995). However, the determinants of environmental action remain unclear. Indeed, much of the research in this area has shown that factors which might be expected to influence environmental action-taking may not do so: for example, experiences with, knowledge of, and concern about environmental issues have been found *not* to be related to action (Blake, 2001; Obregon-Salido and Corral-Verdugo, 1997; Finger, 1994; Gould, 1993; Cary, 1993). While fairly consistent (if weak) relationships have been observed between action around environmental contamination and age, education, and income (Walsh et al., 1993; Elliott et al., 1999), exceptions are often observed (e.g., Darley, 1994). In addition, many other factors have demonstrated strong but inconsistent relationships with environmental action. Gender, for example, has been identified as affecting participation differently in different studies: in certain contexts, women were more active (Brown and Ferguson, 1995), while in others men were more active (Mohai, 1992), and in others there was no difference (Blocker and Eckberg, 1997).

This lack of consistency in results could be due to several factors. First, many previous studies have focussed on a specific factor thought to influence action

(for example, gender - Mohai, 1992). Alternatively, investigators have collected data on a wide range of socio-economic characteristics without considering in advance why and how these factors might influence action. This has limited the extent to which potential predictors of environmental action can be applied in other situations.

Second, most studies use dissimilar outcome variables: environmental action has been measured in different studies in different ways (Blake, 2001). In these studies, different types of action (e.g. recycling vs attending protests) have been conflated, and/or one type of action (e.g. consumer behaviour) has been presumed to be an indicator of broader environmental action. It is small wonder, then, that few consistent predictors of environmental action have been identified.

Finally, few investigations have considered the role of social context, especially the presence and qualities of social networks, in the development of environmental action. In particular, the potential role of social capital in facilitating environmental action has largely been ignored. Since involvement in both formal and informal community networks is thought to facilitate community action around a number of issues (Putnam, 1993, 1995; Levi, 1996), including those related to environmental problems, this is a problematic omission.

In this research, a conceptual framework was developed, which drew on existing literature and the findings of an initial phase of qualitative research, to inform this investigation of possible determinants of environmental action and the linkages between them (Figure 1.1). In particular, the framework allowed for an exploration of both the (possible) direct and indirect/mediated relationships between

the various factors identified and environmental action. In this framework, a number of potentially interdependent *characteristics* (i.e. of the exposure, individual, social network and wider community) set the stage for environmental action, as these characteristics can affect both *predisposition* (i.e. motivation reflected by values, beliefs and attitudes) and *capacity* (i.e. skills and resources that empower individuals and communities) to take action (Green and Kreuter, 1991). In other words, predisposition and capacity can *mediate* the relationship between characteristics of the person/environment/community and the likelihood and type of *environmental action* taken.

1.3 ADVERSE AIR QUALITY AND ENVIRONMENTAL HEALTH IN HAMILTON

This study investigates the relationship between social capital and environmental action using the example of adverse air quality. Air quality was chosen as the example for several reasons. First, air pollution as an environmental risk deserves investigation because it differs in many respects from the exposures which have been the subject of the vast majority of research into environmental perception and concern. That is, while most research has investigated perceived or anticipated risk associated with a specific point source (e.g. Edelstein, 1993; Elliott, 1998), air pollution is a chronic, ambient exposure, which suggests that different kinds of risk responses might be anticipated (Syme et al., 1993; Campbell, 1983). Research into air pollution, therefore, can add to our range of understanding vis-a-vis

the nature of environmental risk perception and associated concern and action.

Second, poor air quality is an important public health issue, as recent studies suggest that this is an area where intervention might significantly benefit public health. Recent research using large-scale data sets has shown a fairly consistent relationship between air pollutant levels and respiratory disease in a variety of communities in the industrialised world (Dockery et al., 1993; Thurston, 1994; Burnett et al., 1998; Morgan et al., 1998). It has long been known that exposure to the principal components of concern with respect to outdoor air pollution (i.e., inhalable and respirable particulate (PM_{10} and $PM_{2.5}$, respectively); sulphur dioxide and sulphuric acid aerosols; nitrogen oxides; ground-level ozone; carbon monoxide; carbon dioxide; air toxics (e.g. benzene, poly-aromatic hydrocarbons (PAHs)); and heavy metals, such as lead and mercury) can have serious health effects (Evans and Jacobs, 1983; Walker and Ogilvie, 1998). For example, particulates, along with sulphur dioxide and other sulphate, are associated with decreased lung function and increased rates of respiratory ailments, hospitalisation and mortality, particularly in sensitive populations such as the elderly and children (Kelsall et al., 1997; Dockery et al., 1993; Vigotti et al., 1996; Schwartz, 1992, 1994; Pope and Dockery, 1992). However, it is only recently that attempts have been made to estimate the general population burden associated with air pollution in given areas. Using this approach, approximately 16 000 deaths a year across Canada (1 800 to 6 000 in Ontario alone) have been attributed to air pollution (David Suzuki Foundation, 1998; OMA, 1998), with a potential 90 excess deaths and 300 excess hospital admissions a year in

Hamilton alone (HAQI, 1997). These new applications, along with ongoing research on the impacts of various air pollutants on human health, have raised air quality as a pertinent area for public health engagement.

Third, air pollution is an issue which has received increased interest from the general public and from policy-makers in Canada over the last few years. This is highlighted by a report circulated by the Ontario Medical Association stating that air pollution poses "a serious risk to the people of Ontario" (OMA, 1998), and the recent initiatives of the federal government to improve air quality standards nationwide (Hughes, 2000). Increased media attention as a result of these and other reports (e.g. David Suzuki Foundation, 1998) have drawn public attention to the issue of air pollution and its effects on health, to the extent that a large proportion (62 to 75%) of citizens express concern about air pollution levels (Mittelstaedt, 1999).

Finally, adverse air quality is an issue which has received a great deal of attention in the community selected for research (i.e., Hamilton, Ontario - Figure 1.2). The City of Hamilton has a long legacy of air quality problems, and a number of initiatives have been undertaken by government, industry, and the community to improve local air quality. Recently, the City embarked on a multi-stakeholder research process which attempted to estimate the health, economic, odour, and aesthetic impacts of poor air quality in Hamilton. While research in this area is ongoing, a recent report indicated that, while significant improvements in air quality have been made as a result of various initiatives, Hamilton still faces a challenge in meeting the demands of its residents in regards to air quality (HAQI, 1997). Citizens

of the Region could play a larger role in achieving these goals, both individually and collectively. However, why some community members become activists and others are apathetic is yet to be fully understood (Greenberg and Schneider, 1997). Greater knowledge of the factors which motivate or hinder action is necessary to further our theoretical and substantive understanding of the relationship between environmental risk perception and community action, and to help empower communities to act to improve their local environments and the health of their populations.

1.4 OVERALL RESEARCH DESIGN

An embedded case-study design (i.e. one in which attention is given to subunits - here, individuals and geographic subdivisions - of the case under study) was used to address the research objectives (Yin, 1989). A case study uses a variety of sources and types of evidence to investigate a contemporary phenomenon within its real-life context (Yin, 1989, Merriam, 1988). In this case, a combination of qualitative and quantitative methods were used to address the specific research objectives. A combined qualitative/quantitative approach is appropriate for this research, given that the research objectives require a serious consideration of variability and particularity as well as generalisability, and an emphasis on process (Eyles, 1998). A mixed-method approach allows researchers to investigate the socio-economic, political, biological and environmental complexities of public health problems from a variety of angles, while respecting the limitations of data sets (Mason, 1994; Baum, 1995).

The research program began with a set of qualitative interviews (n=21) conducted with residents exposed to relatively poor air quality in the urban industrial "North End" of Hamilton (Figure 1.3), to provide a deeper understanding of the facilitators of and barriers to environmental action around air quality. Questions in the interviews were asked according to an interview topic checklist (Appendix A). Results were analysed using the NUD.IST qualitative software program to facilitate line-by-line coding and subsequent thematic analysis.

This was followed by a quantitative epidemiologic survey (n=512) administered to a random sample of households (stratified by area of residence) from across the City of Hamilton (Figure 1.2). The survey identified intra-urban variations in perception, concern, and action around air quality in Hamilton, and investigated factors which affect predisposition and capacity to take action (Appendix B). Bivariate and multi-variate analysis of the survey data was conducted to clarify the relationships between perception, concern, and action around air quality, and to investigate the importance of social capital factors to environmental action (data collection and analysis methods are described in greater detail in the following chapters).

The results of the qualitative component of this research programme enhanced and validated the conceptual framework developed, and informed instrument development for the quantitative survey (Greene et al., 1989). In addition, the qualitative results were used to address aspects of the conceptual framework which were difficult to explore using a quantitative approach, and to illustrate the

quantitative research by providing rich descriptions in respondents' own words (Eyles, 1998; Strauss and Corbin, 1990). Preliminary analysis of the qualitative interviews preceded the administration of the survey, but ongoing analysis of these data occurred (Figure 1.4) in order to better understand survey results and identify discrepancies between findings from the two methods (Green et al., 1989; Brewer and Hunter, 1989; Winchester, 1999). At the conclusion of the research process, the results of the qualitative and quantitative stages of the research were used to triangulate findings between the study components (Baxter and Eyles, 1997; Bryman and Burgess, 1994) and to create a comprehensive study of environmental perception, concern, and action around air quality in Hamilton.

1.6 CHAPTER OUTLINE

The majority of this thesis is a collection of works published in, or submitted to, scholarly journals. **Chapter 2** details the methodology and results of the in-depth interviews conducted with North End residents. Risk perception, concern, and action around an environmental issue are explored to identify factors which influenced *predisposition* and *capacity* to take action (i.e. Objectives 2 and 3), and to explore how *social capital* influenced the relationship between environmental risk perception, concern, and action (i.e. Objective 4). The chapter explores lay understandings and concerns about exposure to air pollution, develops a taxonomy of community action in relation to this issue, and investigates the importance of social capital to civic environmental action.

Chapter 3 introduces the quantitative component of the research with a descriptive analysis of the survey data, focussing on the investigation of intra-urban variation in air quality perception, concern, and action across the City of Hamilton (Objective 1). The survey methodology is discussed in detail, and the observed variation between areas in terms of aggregate individual characteristics, social network characteristics and environmental action are discussed. Predictors of environmental action are also identified through bivariate analysis.

In **Chapter 4**, review of the quantitative analysis continues with the development of logistic regression models to predict a variety of environmental actions. In so doing, the factors which most influence *predisposition* and *capacity* to take environmental action are determined (i.e. Objectives 2 and 3 are addressed using a quantitative approach), and the role of *social capital* in environmental risk perception, concern, and action is further explored (i.e. continued elucidation of Objective 4 is conducted). In addition, this paper focusses attention on the differences which exist between environmental action types.

The final chapter, **Chapter 5**, draws together the three papers presented in the thesis, identifying the results from each paper which make the greatest contributions to the literature, and elaborating the overall implications and contributions of this work. An appraisal of the use of a mixed-method approach in the study of social capital and its relation to environmental action is also included. This thesis ends with a discussion of the policy implications of the work, and suggestions for further

research.

1.7 REFERENCES

Baum, A. 1995. "Researching public health: behind the qualitative-quantitative methodological debate" *Social Science and Medicine* 40 (4): 459-468.

Baxter, J. and J. Eyles. 1997. Evaluating qualitative research in social geography: establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers* 22 (4): 505-525.

Blake DE, 2001, Contextual effects of environmental attitudes and behavior. Environment and Behavior 33 708-725

Blocker, T. Jean, and Eckberg, Douglas L. 1997. Gender and Environmentalism: Results from the 1993 General Social Survey. Social Science Quarterly, 78 (4): 841 - 858.

Brewer, J. and Hunter, A. 1989. *Multi-method Research: a Synthesis of Styles.* Newbury Park, CA: Sage.

Brown, P. and Ferguson, F.I.T. 1995. 'Making a big stink': women's work, women's relationships, and toxic waste activism. *Gender and Society* 9 (2): 145 - 172.

Bryman, A. and Burgess, R.G. (eds.) 1994. *Analyzing Qualitative Data.* London: Routledge.

Burnett, R.T., S Cakmak, and J.R. Brook. 1998. The effects of urban ambient air pollution mix on daily mortality rates in 11 Canadian cities. *Canadian Journal of Public Health* 89: 152 - 156.

Campbell, J.M. 1983. Ambient stressors. *Environment and Behavior* 15: 355-380.

Cary, J. 1993. The nature of symbolic beliefs and environmental behavior in a rural setting. Environment and Behavior 25: 555 - 576.

Darley, S. 1994. But the Working Class Don't Care about the Environment...Do They? *Social Alternatives* 13: 37-41.

David Suzuki Foundation. 1998. *Taking Our Breath Away: the Health Effects of Air Pollution and Climate Change*. Climate of Change Series, Vancouver, Canada.

Dockery, D.W., Pope, A.C. III, Xu, X., et al. 1993. An association between air pollution and mortality in six U.S. cities. *New England Journal of Medicine* 329: 1753 - 1759.

Edelstein, M.R. 1993. "When the honeymoon is over: environmental stigma and distrust in the siting of a hazardous waste disposal facility in Niagara Falls, New York" *Research in Social Problems and Public Policy* 5: 75 - 95.

Elliott, S.J. 1998. A comparative analysis of public concern over solid waste incinerators. *Waste Management Research* 16 (4): 351-364.

Elliott, S.J., Cole, D.C., Krueger, P. et al. 1999. The power of perception: health risk attributed to air pollution in an urban industrial neighbourhood. *Risk Analysis* 19 (4): 615 - 628.

Evans, G.W., and Jacobs, S.V. 1983. Air Pollution and Human Behavior. In G.W. Evans (Ed.), *Environmental Stress.* (pp. 105-132). Cambridge: Cambridge U.P.

Eyles, J. 1998. Interpretive Approaches in Health Research. *Qualitative Analysis in Process Evaluation for Heart Health Promotion.* Conference Proceedings. February 25-27. (Population Health Fund, Health Canada).

Eyles, J. 1985. *Senses of Place*. Warrington: Silverbook Press.

Finger, M. 1994. From knowledge to action? Exploring the relationships between environmental experiences, learning, and behavior. *Journal of Social Issues* 50 (3): 141-160.

Fukuyama, F. 2000. Social Capital. In Harrison, L.E. and Samuel, P., eds. *Culture Matters: How Human Values Shape Human Progress*. New York: Basic Books. pp. 98 - 111.

Gould, K.A. 1993. Pollution and Perception: Social Visibility and Local Environmental Mobilization. *Qualitative Sociology* 16: 157-178.

Green, L.W. and M.W. Kreuter. 1991. *Health Promotion Planning: An Educational and Environmental Approach.* 2nd ed. Mountain View, CA: Mayfield Publishing.

Greenberg M. and Schneider, D. 1997. Neighborhood quality, environmental hazards, personality traits, and resident actions. Risk Analysis 17 (2):169-175.

Greene, J.C., Caracelli, V.J., and Graham, W.F. 1989. Towards a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis* 11: 255-274.

Harvey, D. 1996. *Justice, Nature, and the Geography of Difference*. Cambridge: Blackwell.

HAQI (Hamilton Air Quality Initiative). 1997. *Human Health Risk Assessment for Priority Air Pollutants.* Hamilton: Regional Municipality of Hamilton-Wentworth.

Hayes, M. 1999. 'Man, disease, and environmental associations': from medical geography to health inequalities. *Progress in Human Geography* 23 (2): 289 - 296.

Heiman, M.K. 1997. Community attempts at sustainable development through corporate accountability. *Journal of Environmental Planning and Management* 40: 631-643.

Hughes, Rick. Ottawa to get tough on smog. *Hamilton Spectator* (Saturday May 20, 2000), A1, A12.

Hummon, D.M. 1990. *Commonplaces: Community Ideology and Identity in American Culture*. Albany, NY: State University of New York Press.

Ife, J. 1995. *Community Development.* Melbourne: Longman.

Kelsall, J.E., J.M. Samet, S.L. Zeger, and J. Xu. 1997. Air pollution and mortality in Philadelphia, 1974-1988. *American Journal of Epidemiology* 146: 750-762.

Levi, M. 1996. Social and unsocial capital: A review essay of Robert Putnam's *Making Democracy Work. Politics and Society* 24(1):45-55.

McDowell, L. 1997. *Undoing Place?* London: Arnold.

Merriam, S.B. 1988. *Case Study Research in Education.* Beverly Hills: Sage.

Mittelstaedt, Martin. 1999. Air quality rules too lax, poll finds. Globe and Mail, Tuesday April 20, A10.

Mohai, P. 1992. Men, women, and the environment: an examination of the gender gap in environmental concern and activism. *Society and Natural Resources, 5,* 1-19.

Morgan, G., et al. (1998). Air pollution and daily mortality in Sydney, Australia. *American Journal of Public Health* 88: 759-763.

Mason, J. (1994) 'Linking qualitative and quantitative data analysis', in Bryman, A. and Burgess, R.G. (eds), *Analyzing Qualitative Data,* London: Routledge, pp. 89-110.

Nevitte, N. and Kanji, M. 1995. Explaining environmental concern and action in Canada. *Applied Behavioral Science Review* 3 (1):85-102.

Northridge M.E. and P.M. Shepard. 1995. Environmental racism and public health. *American Journal of Public Health* 87 (5): 730-731.

Obregon-Salido F, Corral-Verdugo V, 1997, "Systems of belief and environmental conservation behavior in a Mexican community" Environment and Behavior 29 213-235

OMA (Ontario Medical Association). 1998. *Ground Level Ozone Position Paper.* Toronto: OMA.

Petersen, A. and Lupton, D. 1996. *The New Public Health: Health and Self in the Age of Risk.* Thousand Oaks, CA: Sage.

Popay, Jennie. 2000. Social capital: the role of narrative and historical research. *Journal of Epidemiology and Community Health,* 54: 401.

Pope, C.A. III, and Dockery, D.W. 1992. Acute health effects of PM10 pollution on symptomatic and asymptomatic children. *American Review of Respiratory Disease* 145: 1123 - 1128.

Putnam, R. 1995. Bowling alone: America's declining social capital. *Journal of Democracy* 6 (1): 65-78.

Putnam, R. 1993. *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton, NJ: Princeton U.P.

Schwartz, Joel. 1994. Air pollution and daily mortality: a review and meta-analysis. *Environmental Research* 64: 36 - 52..

Schwartz, Joel. 1992. Particulate air pollution and chronic respiratory disease. *Environmental Research* 62: 7-13.

Stern, Paul C. 2000. Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56 (3): 407 - 424.

Strauss, A. and J. Corbin. 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.* Newbury Park: Sage.

Syme, G.J., Beven, C.E., and Sumner, N.R. 1993. Motivation for reported involvement in local preservation: the roles of knowledge, disposition, problem assessment, and arousal. *Environment and Behavior* 25 (5): 586-606.

Thurston, G.D., Ito, K., Hayes, C.G., et al. 1994. Respiratory hospital admissions and summertime haze air pollution in Toronto, Ontario: consideration of the role of acid aerosols. *Environmental Research* 65: 271-290.

Vigotti, M.A., Rossi, G., Bisanti, L., et al. 1996. Short term effects of urban air pollution on respiratory health in Milan, Italy, 1990-1989. *Journal of Epidemiology and Community Health, 50*, s71 - s75.

Walker, D. and Ogilvie, K. 1998. *The Air Children Breathe: The Effects on Their Health.* Conference Proceedings. Toronto, ON: Pollution Probe/Institute of Children's Health.

Walsh, E., Warland, R., and Smith, D.C. 1993. Backyards, NIMBYs and incinerator sitings: implications for social movement theory. *Social Problems* 40 (1): 25-38.

WHO (World Health Organisation). 1986. *Ottawa Charter for Health Promotion.* Geneva: WHO.

Wilkinson, R.G. 1996. *Unhealthy Societies: The Afflictions of Inequality.* London: Routledge.

Winchester, Hillary P.M. 1999. Interviews and questionnaires as mixed methods. *Professional Geographer* 51 (1): 60-67.

Yin, R.K. 1989. *Case Study Research: Design and Methods*. Beverly Hills: Sage.

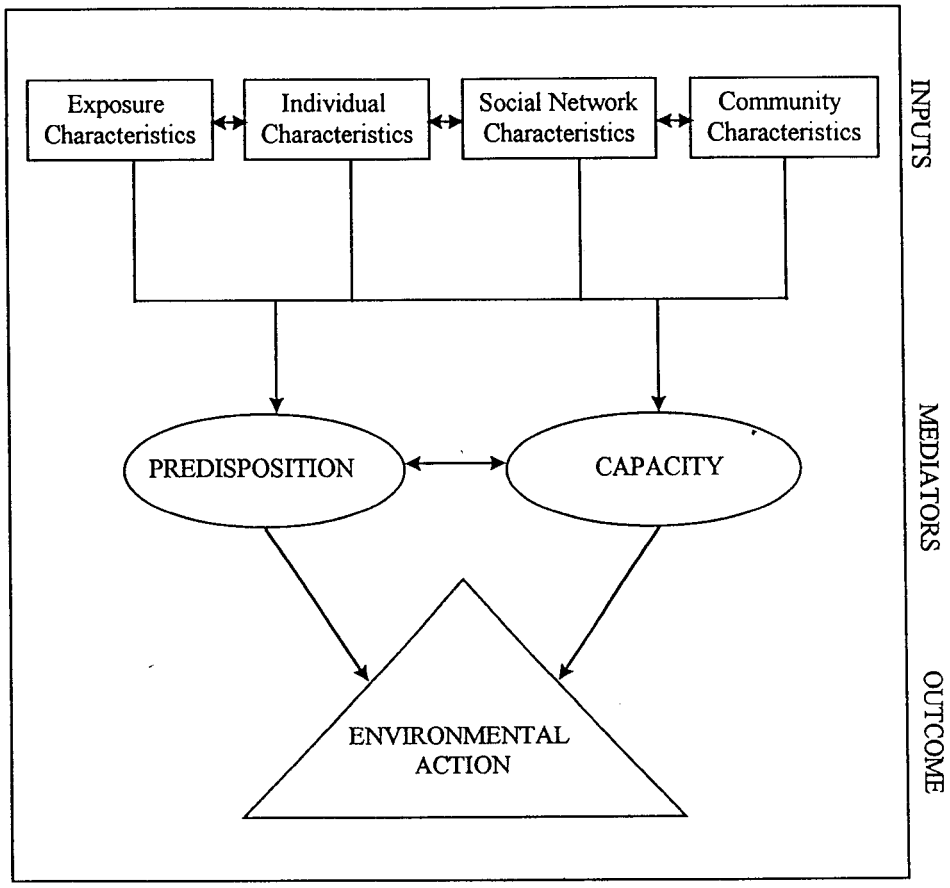

FIGURE 1.1

Conceptual Framework

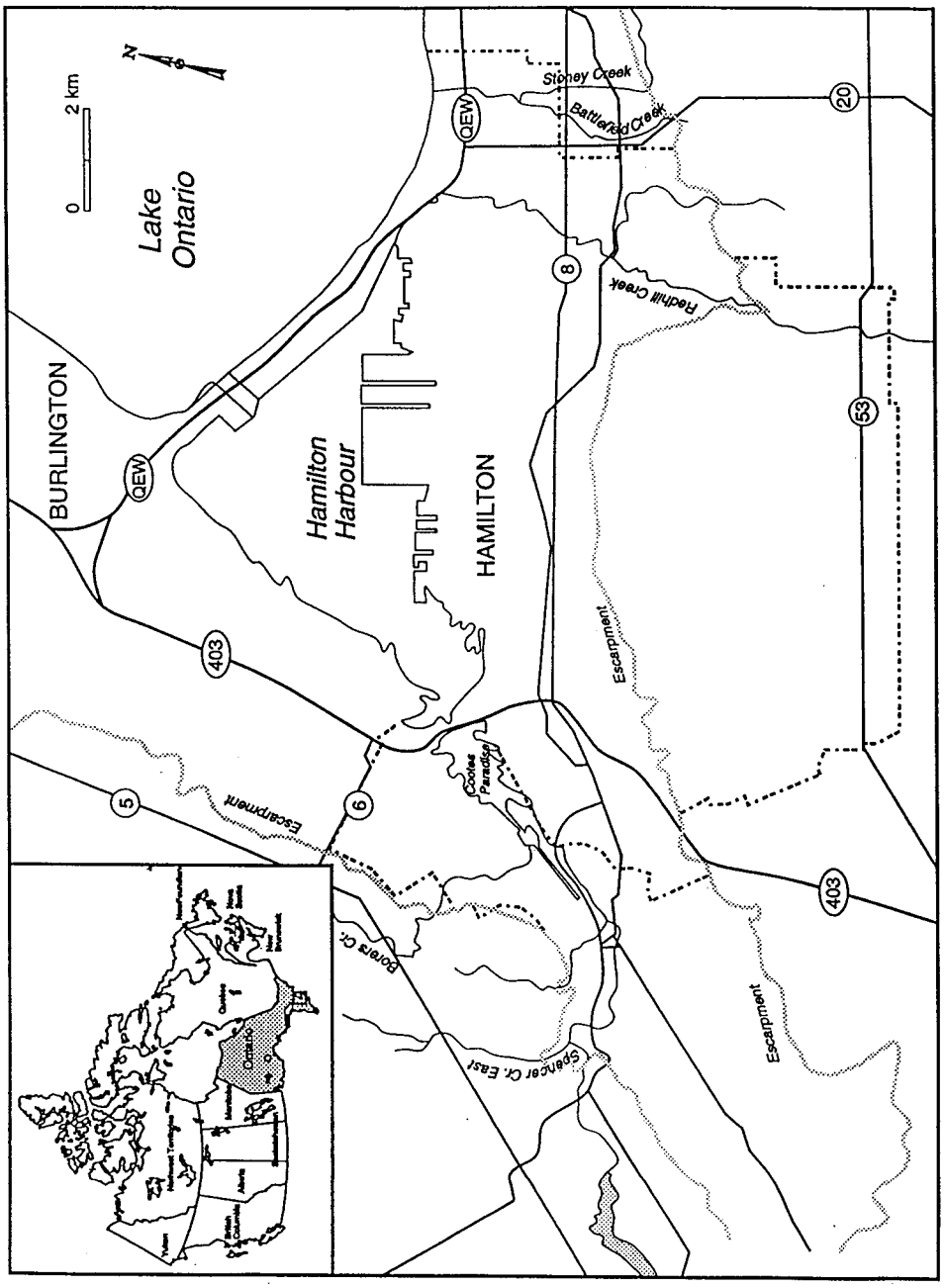

FIGURE 1.2

Map of Hamilton, Ontario

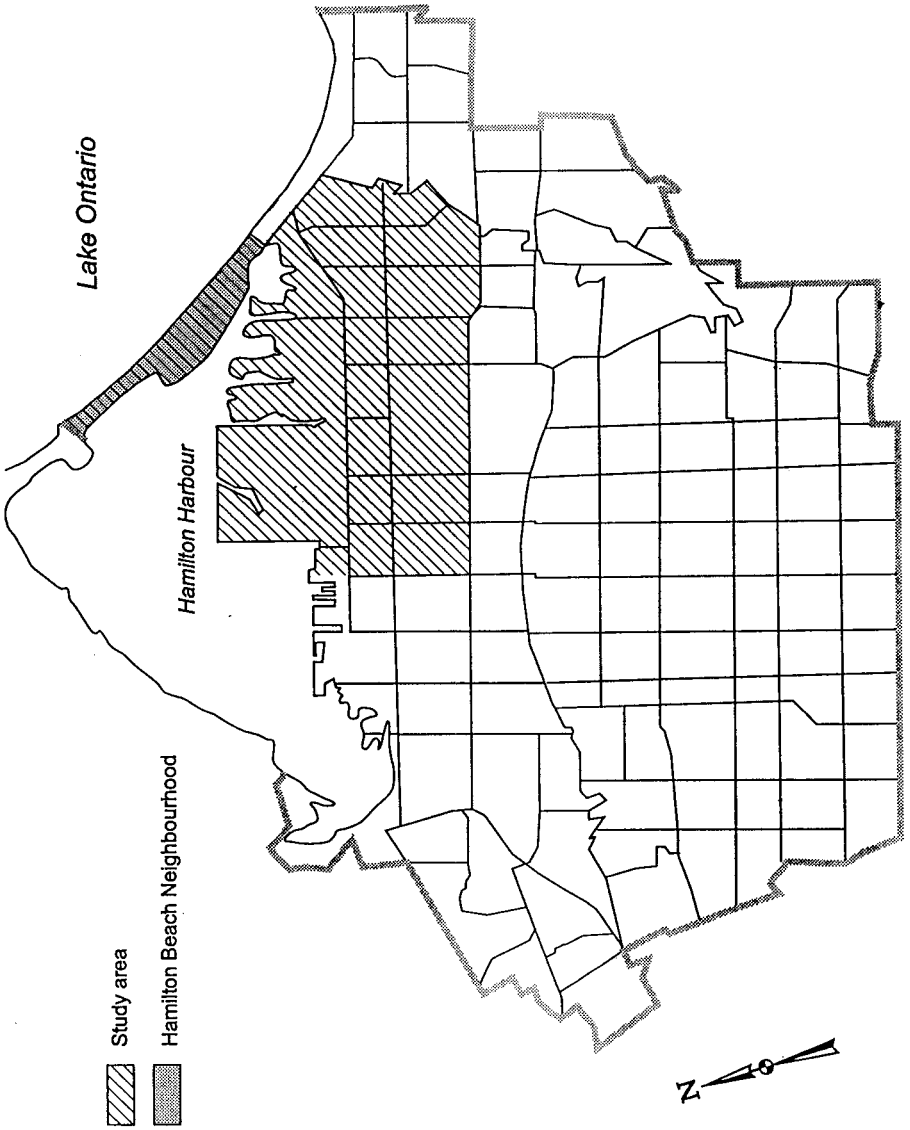

FIGURE 1.3

Map of North Hamilton Study Area

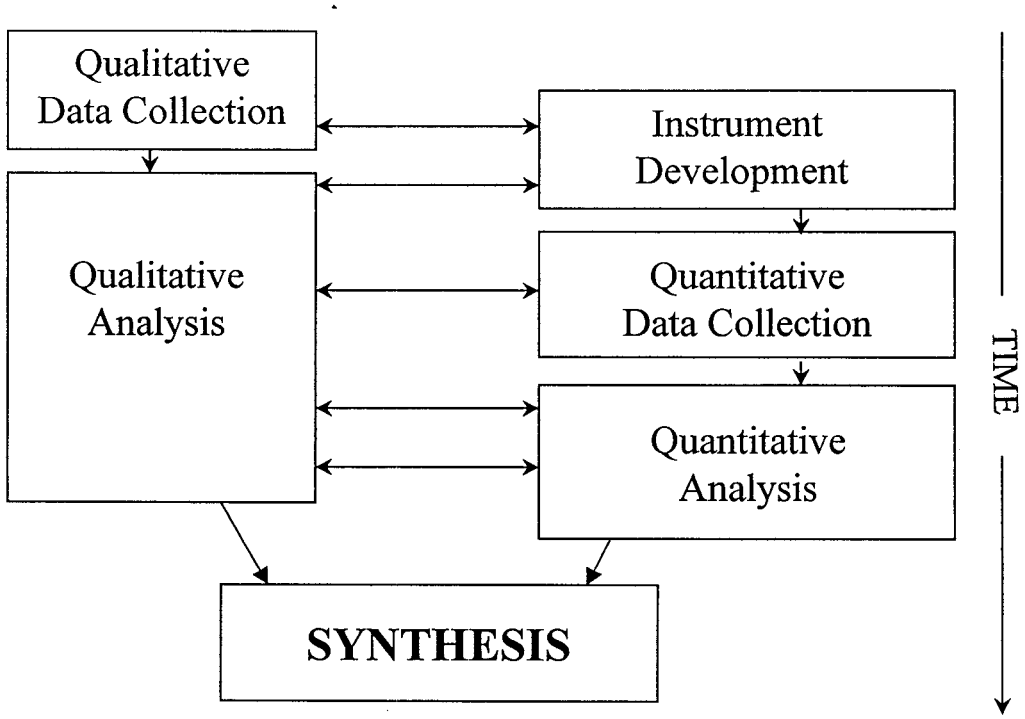

FIGURE 1.4

Diagram of Research Phases

CHAPTER 2

ENVIRONMENTAL RISK AND (RE)ACTION: AIR QUALITY, HEALTH, AND CIVIC INVOLVEMENT IN AN URBAN INDUSTRIAL NEIGHBOURHOOD

Sarah E.L. Wakefield[1], Susan J. Elliott[1,2], Donald C. Cole[2], and John D. Eyles[1,2]

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ABSTRACT

This paper explores the links between (perceived) environmental risk and community (re) action in an urban industrial neighbourhood in Hamilton, Ontario, Canada. In-depth interviews were conducted with residents of an area with a documented history of adverse air quality, in order to determine the relative influence of *social capital* (networks, norms, and social trust) and *place attachment* (sense of belonging in a neighbourhood) in deciding to take civic action around this particular environmental issue. The interviews illustrate the complexity of lay understandings of air pollution, and indicate that social capital is a primary contributor to the decision to take certain kinds of action, while attachment to place plays a lesser role.

KEYWORDS: environmental risk perception, air pollution, civic action, social capital, place attachment

[1] School of Geography and Geology, McMaster University, 1280 Main St. W., Hamilton, ON L8S 1K4, (905) 525-9140 x24080, fax (905) 546-0463

[2] Institute of Environment and Health, McMaster University, 1280 Main St. W., Hamilton, ON L8S 1K4

2.1 INTRODUCTION

In Canada and around the world, environmental problems are receiving increasing attention from researchers, policy-makers, and the public (Dunlap, Gallup, and Gallup, 1992; Burnett et al., 1998; David Suzuki Foundation, 1998). Adverse air quality, in particular, is now a central public health concern (Mittelstaedt, 1999; Schwartz, 1994; Morgan et al, 1998). This public health concern is fed by input from respected bodies such as the Ontario Medical Association (OMA, 1998) which declared of a "state of emergency" in Ontario in 1998 about the "a serious risk" posed by air pollution to human health (Hughes, 1998).

Within the Regional Municipality of Hamilton-Wentworth, Ontario, Canada[1] (Figure 2.1) air quality issues are a focus of research, action and policy (HAQI, 1997a). Past research has indicated that concern about air pollution is high in the urban industrial area of the Region, where air quality has historically been poor (Elliott et al., 1999). However, high levels of concern are not linked to high levels of citizen action: few residents in even the most affected areas have taken any action around the issue of air quality (Elliott et al., 1997). The potential role of *social capital* - that is, the social networks, norms and trust that facilitate community co-ordination and co-operation (Putnam, 1993, 1995; Ife, 1995; Heiman, 1997; Hayes, 1999) - and *place attachment* -i.e. emotional connection with and sense of belonging

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[1] The Region of Hamilton-Wentworth is now known as the City of Hamilton, following the amalgamation of the Region's constituent municipalities into one administrative unit in 2000.

in a locale (Eisenhauer et al., 2000; Chavis and Wandersman, 1990; Altman and Low, 1992; Freudenberg and Steinsapir, 1991) - in facilitating collective action around a variety of community (health) problems is highlighted in the literature. However, the determinants of civic action around environmental health issues have yet to be explored in any depth (Greenberg and Schneider, 1997).

This paper explores the relationship between health risk perception, concern, and action around an environmental issue by focussing on the roles of *social capital* and *place attachment*. Specifically, the objectives of this paper are to:

- investigate risk perception and concern around adverse air quality;
- develop a taxonomy of community action in relation to this issue; and,
- explore the potential contributions of *social capital* and *place attachment* to our understanding of community environmental action.

This study is one component of an ongoing research programme investigating the impacts of adverse air quality on the health and well-being of communities. The in-depth interviews discussed in this paper were preceded by a quantitative survey conducted across the "North End" of Hamilton (Elliott et al., 1999) which focussed on documenting levels of reported air quality concern. A larger-scale quantitative survey will subsequently be administered across the entire region of Hamilton-Wentworth (Figure 2.1).

This paper reports the results of the qualitative component of this research programme. It begins with a brief review of the literature around environmental risk

and (re)action, particularly with regard to the roles of social capital and place attachment. The community context in which the research is situated is then described, followed by a summary of the methods used in this component of the research programme. The results of this research are presented and discussed in the context of the contributions of these findings to the literature around social capital, environmental action and community well-being.

2.2 ENVIRONMENTAL RISK AND (RE)ACTION

One useful approach for investigating environmental risk and (re)action is environmental stress and coping theory (e.g. Elliott et al, 1999). Herein, risk is socially constructed; it is a subjective, cultural construct which is "rooted in daily experience and assessed by reference to experience" (Phillimore and Moffat, 1994, 147). Traditionally, risk has been measured using psychometric, quantitative risk assessment measures. For example, the classic work by Slovic et al (1987) used lists of potential risks ranked on a 5-point Likert scale in order to discern variations in risk perception between scientific experts and the lay public (see also Fischhoff et al, 1981). However, recent research demonstrates that these measures alone do not provide a comprehensive understanding of the relationships between environmental risk, concern, and action (Adams, 1995). This is due in large part to the realisation that risk is socially and culturally constructed (Douglas and Wildavsky, 1982; Beck, 1992; Baxter et al, 1999a, 1999b). As a result, there has been a shift toward

qualitative approaches to measuring and understanding risk (Baxter et al., 1999a, 1999b).

Theories of environmental stress and coping (Lazarus, 1993; Lazarus and Folkman, 1984; Fischhoff et al., 1987) can help contextualise individual and community environmental (re)action. Lazarus and Folkman (1984) suggest that reaction to an environmental stressor can take one of two forms: problem-focussed, or active, coping (e.g. joining a local citizen's group) or emotion-focussed coping (e.g. wishing the stressor would simply go away). Coping is an ongoing process (Lazarus 1993; Elliott et al., 1997b), and individuals are likely to use multiple coping strategies (Wakefield, 1998) to respond to problems, including but not limited to civic action (that is, individual or collective action/activism intended to initiate societal change).

Given the broad range of active coping strategies possible, action around an environmental risk such as air pollution is potentially widespread, particularly in highly affected areas. However, these responses might include actions taken to mitigate the impacts of exposure (e.g., staying indoors, hanging laundry inside rather than outside - Elliott et al., 1999) rather than reduce the exposure itself (the goal of civic action). Different actions in response to perceived environmental risks are not necessarily equivalent, therefore, as their effectiveness in empowering individuals and communities and in initiating societal change may vary substantially. Some researchers have attempted to distinguish between types of action (e.g., Arnstein (1969) and Langton (1978)), but their categorizations are concerned with political

rather than environmental action, and so may fail to account for the full range of possible actions around perceived environmental risks.

In several empirical investigations of the determinants of environmental action, environmental concern has (perhaps counter-intuitively) been found to be a poor predictor of action (Kufrin, 1995; Finger, 1994; Lober, 1995). Other potential determinants of environmental action (e.g. gender, age, income, education) have also been investigated (Walsh et al., 1993; Brown and Ferguson, 1995; Perkins et al., 1996; Seguin et al, 1998), but the direction and intensity of the relationships found vary greatly from study to study (Tranter, 1996). Other factors, associated with community rather than individual characteristics (such as social capital and/or attachment to place), may mediate the relationship between environmental concern and action. However, little if any investigation of the potential roles of these factors has been undertaken in this context.

2.2.1 The Role of Place Attachment and Social Capital

Place attachment, the sense of belonging and emotional investment in a place (Hummon, 1992; Eyles, 1985; Eisenhauer, 2000), has been identified as a potential influence on action within a community (Chavis and Wandersman, 1990). Attachment to place is often related to community satisfaction (Hummon, 1990; Mesch and Manor, 1998); thus, poor valuations of a community can limit the extent to which residents identify themselves with, or are attached to, a community. In particular, (environmentally) degraded or damaged "places" may be reflected in

injured or absent community identities (Lipshutz, 1996). On the other hand, residents in areas viewed as unpleasant by *outsiders* may in some cases be greatly attached to their communities (Greenberg and Schneider, 1996; Hummon, 1990; Preston et al., 1983), and this attachment to undervalued and often damaged places might be an important starting point for environmental and social action (Chavis and Wandersman, 1990; Freudenberg and Steinsapir, 1991).

Social capital has been defined in the literature as the "features of social organisation such as networks, norms, and social trust that facilitate co-ordination and co-operation for mutual benefit" (Putnam, 1995, 67). Involvement in various aspects of the community, such as little league teams and social clubs, is thought to produce self-reinforcing networks and shared norms of behaviour between community members (i.e. social capital) which may encourage collective action for mutual benefit (Putnam, 1993; Levi, 1996). It has been further suggested in the literature that the presence of social capital may facilitate civic action around societal issues (Ife, 1995; Heiman, 1997; Hayes, 1999; Wilkinson, 1996, 1997).

There is some potential for overlap between the concepts of social capital and place attachment. Certainly, the development of local ties is thought to play a large role in the development of attachment to place (Qiaoming et al, 1998; McHugh and Mings, 1996), and in some cases attachment to place may represent a starting point in the development of social capital. However, the development of place attachment may also depend on the physical features and structures of a neighbourhood (Hummon, 1990; Mesch and Manor, 1998), and on *informal* ties (e.g. friendships)

rather than the formal or semi–formal ties (e.g. school advisory groups) which are more generally associated with social capital (Qiaoming et al, 1998). In any case, social capital and place attachment are likely to be mutually reinforcing in communities and neighbourhoods where they exist.

Hence, attachment to place and social capital may contribute to community health and well-being, both directly and indirectly. Indirectly, attachment to place and social capital may facilitate environmental action in affected neighbourhoods, thereby enhancing the potential for change and related positive impacts on community health and well-being. For example, Preston et al (1983) found high levels of awareness and concern around environmental issues in the industrial 'Hamilton Beach' neighbourhood (Figure 2.2). In response to these concerns, residents reported taking civic action to reduce environmental exposures, rather than leave a neighbourhood to which they reported strong attachment due to extended family and social networks. These actions resulted in positive changes to the neighbourhood's physical environment (i.e. reduced exposure) and hence potential benefits to health.

Both attachment to place and social capital may also have direct positive impacts on the health and well-being of individuals and communities (Rose, 2000; Wilkinson, 1996). As Wilkinson (1996) notes, perceptions of subjective reality can be just as - if not more - important in determining well-being as actual environmental exposures:

> It is the social feelings which matter, not exposure to a supposedly toxic material environment. The material environment is merely the indelible mark and constant reminder of one's failure, of the atrophy of any sense of having a place in a community, and of one's social exclusion and devaluation as a human being. (215)

Neighbourhoods and communities, therefore, can be sources of self-denigration or self-affirmation, depending on their location and social characteristics (McDowell, 1997; Eyles, 1985), and this can in turn influence health.

It has been suggested that the development of social capital within a community can benefit health and well-being (Kawachi et al, 1997; Wilkinson, 1996, 1997; Lomas, 1998), although some theorists question whether social capital is uniformly beneficial (e.g. Levi, 1996; Popay, 2000). That is, social capital may serve a greater function in neighbourhoods with lower socio-economic status, as informal social relations can replace services often commodified in higher income neighbourhoods (e.g. child care) (Kelly, 1994). Further, it has been argued that the community norms and networks associated with strong social capital may have negative consequences for some community members under certain circumstances, where actions are constrained rather than supported by social "ties" (e.g. traditional gender roles) (Levi, 1996; Abel, 1995; Habermas, 1984). On balance, however, the potential of social capital to help achieve better health, particularly in disadvantaged communities, cannot be ignored.

2.3 THE NORTH HAMILTON COMMUNITY

The study area, chosen in consultation with residents and the local public health department, consisted of a segment of the industrial northeast of the City of Hamilton (Figure 2.2). In comparison to the City of Hamilton and the Region of Hamilton-Wentworth, the study area has a greater proportion of low income households, poorly educated residents, and residents whose first language is not English (Table 2.1). The study area could be considered an environmentally devastated neighbourhood (Greenberg and Schneider, 1996), given the co-location of multiple hazards within its boundaries (e.g., air pollution, high traffic volume, and higher than average crime rates - Herron, 1996; HAQI,1997b). Yet, as Preston et al.(1983) found almost 20 years ago, residents in one North Hamilton neighbourhood, although aware of its environmental hazards, remained there because of opportunities for affordable home ownership and the existence of strong social networks.

The steel industry has historically formed the backbone of the Hamilton economy, and the steel mills still play a fundamental role in the social fabric of the study area as well as in the city as a whole. Steel manufacturing (concentrated along the south shore of Hamilton Harbour within the study area) and other local industries are responsible for approximately 30% of air pollution in the Region; long range contaminant transport (primarily from the USA) and transportation-related pollution make up the bulk of the remaining 70% (HAQI,1997a). Although air quality in most of Hamilton-Wentworth is not significantly different than that of nearby urban

centres, the study area (Figure 2.2) has higher than average levels of certain pollutants, including particulate matter and sulphur dioxide (HAQI,1997b).

Grass roots community groups in the study area have been actively involved in attempting to influence environmental standard setting as well as industrial operations in order to improve local air quality. For example, the Homeside Environmental Committee (HEC) was formed in early 1993 by residents who shared a common concern about an apparent increase in 'black fallout' in their neighbourhood. Their efforts resulted in the formation (autumn, 1994) of an interdisciplinary working group involving both academics and public health officials mandated to respond to the concerns of this community and to estimate the health, economic, odour, and aesthetic impacts of poor air quality within the Region more generally (HAQI, 1997a). This working group used local airborne particulate, census and hospital admission data to carry out a quantitative health risk assessment (HAQI, 1997a). This assessment attributed approximately 90 excess deaths and 300 excess hospitalizations annually to air pollution. The results of this risk assessment were unable, however, to address the broader health and daily life concerns raised by members of the community (e.g. the extent of impacts on quality of life). Hence, in the winter of 1997/98, a community health survey - the first stage of this research programme - was administered to 402 households living across the north end of the city of Hamilton in order to assess levels of concern and health concern associated with perceptions of various types of air pollution, as well as to assess the impacts of these perceptions on daily life. The survey found that approximately three quarters

of respondents reported concerns both about air pollution and the significant lifestyle disruption it caused, yet only a small percentage (11%) reported having telephoned, written to or spoken to politicians, government staff or industry representatives about air pollution over the past two years (Elliott et al., 1999). Finding such low levels of civic action, despite significant concern, provided the impetus for this qualitative follow-up as a means of exploring why concern was *not* being translated into action to reduce or remove exposure.

2.4 METHODS

This study uses in-depth interviews to address the research objectives given above. The use of qualitative approach facilitates the exploration of phenomena in relation to experiences in daily life (Eyles, 1998; Elliott, 1999). Interviews (n=21) were conducted with a subset of households from the initial quantitative survey (n=402). This subset was selected through maximum variation sampling (Quinn-Patton, 1990). When using a qualitative approach, samples are not intended to be representative, as the goal of this type of research is not generalisation. Rather, respondents are selected in order to represent maximum variation across a range of factors. In this instance, respondents were selected to represent varying levels of involvement and concern around air quality, residence within a range of neighbourhood types and distance from the industrial core, the absence or presence of children in the household, and varying levels of reported respiratory health. In addition, an attempt was made to include equal numbers of male and female

respondents. An initial sampling frame of 80 respondent households from the quantitative survey (n=402) was randomly generated; these respondent households were then categorized on the basis of the selection criteria identified above. From this matrix, potential respondents were selected. These respondents received an introductory letter and a follow-up telephone call to determine their willingness to participate. All potential respondents who refused to be interviewed were replaced by individuals with similar characteristics vis a vis the maximum variation criteria. Although the sample was not meant to be representative of the study population, Table 2.1 identifies the characteristics of respondent households relative to the characteristics of the initial survey respondents, the larger study area, the City of Hamilton, and the Region of Hamilton-Wentworth. These data indicate that respondent households under-represent less educated, low income, and immigrant households. This must be borne in mind when interpreting results.

Interviews (lasting between 30 and 90 minutes) were conducted between May and October, 1998, by a single researcher. In five cases, additional adult household members were present at the interview, adding to the richness of the data set. In each interview, a series of semi-structured, open-ended questions were asked from an interview checklist. The order in which questions were asked varied according to participants' responses to enhance interview flow and responsiveness (Quinn-Patton, 1990). Questioning centred around respondents' perceptions of their communities

and social networks, perceptions and concerns around local air and other pollution, sources of information about pollution, and actions taken in response to pollution.

Interviews were tape-recorded and transcribed verbatim for subsequent thematic analysis using the NUD.IST qualitative software package (Richards and Richards, 1994). Thematic categories were identified through line-by-line coding (Strauss and Corbin, 1990). Key themes were then identified according to a number of criteria, including relevance to the research objectives, frequency (the number of interviews in which the theme was mentioned), universality (the predominance of the same themes across different types of participant stakeholders) and/or differentiation (the importance of different themes to different groups), relative importance of the categories within interviews (indicated by the number of mentions of a topic within an interview and the amount of text taken up to address an issue), and emphasis (e.g., emphatic or emotional speech) (Wakefield and Elliott, 2000). Once key themes were identified, linkages between the various themes were examined.

2.5 RESULTS

Results are organised around the three research objectives. First, respondents' air pollution risk perceptions and concerns are examined in relation to the urban industrial context in which they occur. Next, a taxonomy of actions related to air pollution is introduced. This is followed by an exploration of the potential contributions of social capital and place attachment to our understanding of community environmental action. To facilitate the reporting of results, a series of

tables (Tables 2.2 - 2.6) which list the number of interviews in which particular concepts were mentioned are provided (Morgan, 1993; Miles and Huberman, 1994). Direct quotations are also used to illustrate results, with respondents identified by pseudonyms in order to preserve their anonymity (respondent ages are approximate).

2.5.1 Perceptions and concerns related to air pollution

Most interview participants had experienced air pollution in their neighbourhoods. The sensate nature of the exposure was emphasized by respondents:

> You can see it. You can smell it. You can almost feel it. Well, you can feel it sometimes. A few months back there, you could almost feel the grit in the air it was so bad. You could just feel the dirt on your skin. In the winter the snow gets a little, you know, dusty. If there's no snow for a while it's like fallout. And the smell is terrible. It's like eww... It's rather like sulphur smell. Or else you get this ink, like a strong inky smell. It goes right to the back of your throat and chokes you. ("Mary" - 60 years old, 11 year resident)

Respondents were sensitive to variations in exposure over time (e.g., seasonal variation) and to the attributes of exposures (e.g., red versus black dust). Respondents noted geographical variations in exposure, with certain places within the study area being identified as having better or worse air quality:

> It affects the middle of the beach in a certain area, and it's an orange dust that falls down and it completely covers your vehicles and your house and everything outside. ("Bob" - 30 years old, lifetime resident)

> And then there's just sort of... a wall... where the pollution really starts. It seems to be around [---- Road]. ("Ellen" - 35 years old, 6 year resident)

> You can smell the air there. It stinks around there and like I say, once you get this side of [---- Avenue] even the air smells better. ("Flora" - 50 years old, 3 year resident)

Respondents were particularly aware of air pollution in their community when dust and fallout were visible:

> I wouldn't walk outside in your bare feet or your feet get black, even though you've washed the patio down - it doesn't take long. Your clothes line, you have to wash the line off before you put clothes on it. ("Delia" - 40 years old, lifetime resident)

> Oh, the dirt, the dust...We have a pool in the backyard and we get a film on it occasionally. ("Paul"- 55 years old, 24 year resident)

> If you have just washed your car, you come out and you can see spots all over it. My parents... would wash their porch and the next day my kids would come down to play at their house and they would end up with black knees. ("Alison" - 40 years old, lifetime resident)

Thus, a number of inconvenient lifestyle impacts were associated with the presence of air pollution, and particularly fallout, in the community. Air pollution was also considered by many respondents to be the cause of their respiratory health problems (Table 2.2):

> Even when I go away for a weekend somewhere...on that bridge [into the city] I start having breathing problems. So the pollution is very, very strong. When I was living in Calgary I never had a cold before. I was never sick. And now I am all the time. ("Monique" - 45 years old, 20 year resident)

> I really never had any problems breathing until I moved down there. So I know that it is definitely the area. ("Ted" - 30 years old, 7 year resident)

As the above quotes illustrate, respondents have an anecdotal, personal understanding of air quality. Perceived health impacts seemed to depend on the visible signs of pollution, rather than expert assessments of risk:

> Something that affects my lungs. You know, you breathe it in and you can see it on the floor and on the window sill. So I'm breathing that in and your lungs are a filter and all that stuff's clogging it. ("Phil" - 35 years old, 9 year resident)

> A lot of chemical smells around here. You're wondering "just what am I inhaling?" ("Mary" - 60 years old,11 year resident)

Respondents did, however, note their lack of "scientific" knowledge of the issue, making them somewhat uncomfortable voicing claims that air pollution was responsible for poor health in the area. Respondents also recognised that the risk associated with their own "bad habits" (particularly smoking) could make it difficult to assess the relative contribution of air pollution to their poor health. Respondents were reluctant to place the blame entirely on themselves, however, given their perceptions of other risks:

> I mean, I'm a smoker and I know I contribute to the pollution because of it but if you didn't smoke you are still inhaling everything. You can still die of lung cancer from the exhaust that is in your system... ("Peter" - 50 years old,11 year resident)

Air pollution, therefore (unlike smoking), was seen as an *involuntary*, ubiquitous risk to health in the North Hamilton community, as well as a major nuisance. Some respondents were also concerned about the effects of air pollution on the "environment" more generally, voicing the opinion that air pollution had damaged natural environments both locally and globally (Table 2.2):

> I can't see how they're going to clean up the lake and that, with all that black stuff that comes out of [that factory]. It'd be dropping in the water when it blows that way... Used to be a lot of Canadian geese over here, too, at one time. Now, I guess it's the air pushing them all away. ("Barb" - 40 years old, lifetime resident)

> It doesn't take a rocket scientist to see that summers are getting much drier than they have been. We are getting extreme, drastic conditions as far as weather is concerned... and the only difference between these and between now and years ago is the amount of pollution that we've added, how much we have destroyed our own ozone layer, our own breathing space. ("Frank" - 60 years old, 17 year resident)

Despite these serious concerns, the risks associated with air pollution were often overshadowed by other environmental risks, including the presence of a sewage treatment plant, a proposed expressway through a nearby natural area, dangerous driving, litter, abandoned and/or deteriorating buildings, uncontrolled animals, and crime:

> Well put it this way, most of the people I know call it Harlem. Honest to God, [there are] break and enters every day, crack heads... people getting beat up, the hookers walking the streets... I think almost every single apartment in the two buildings next to me and the one just around the corner have been broken into. ("Ted" - 30 years old, 7 year resident)

These risks were experienced more widely and severely in certain parts of the study area than others: respondents in the western portion of the study area (Figure 2.2) commented more on crime, litter, and infrastructure decay, while residents in the eastern half reported concerns about the sewage treatment plant and the proposed expressway (both of which are located at the eastern perimeter of the study area). By

contrast, respondents living in the "Hamilton Beach" neighbourhood (Figure 2) were most concerned about air pollution:

> People take care of the beach, they clean it up and keep their houses good. Like 98% of the people care about the appearance of their homes. And with more people coming down there and building new houses it's going to look great. Just don't build a white house and don't buy a white car. ("Bob" - 30 years old, lifetime resident)

2.5.2 Environmental action

Respondents reported using a variety of active and passive strategies for coping with air pollution in their community. For this research, "action" is defined broadly in order to capture the variety of coping strategies used by respondents. Active coping strategies identified in this research have been grouped into four categories (Table 2.3): reappraisal of lifestyle options; personal change; individual civic action; and group civic action. Reappraisal of lifestyle options is typified by individual responses to air pollution which do *not* support social change. For example, individuals reported that they had to clean (both indoors and outdoors) far more often because of air pollution, and had to limit use of their yards (e.g., by not growing vegetables, hanging laundry or letting children play) because of fallout. Respondents also limited their outdoor activities on days with poor air quality, to the extent that some respondents rarely left the house, and many felt forced to purchase air conditioners and air filters:

> I have an air cleaner on my furnace; I have air cleaners positioned throughout the house. I have an air conditioner in the bedroom, so at night the bedroom window's not open. So, I've gone to great expense to keep things a certain way. ("Sue" - 35 years old, 4 year resident)

These responses to air pollution represent an important facet of environmental action, with nearly all respondents reporting changed or limited activities as the result of air pollution.

The second category, personal change (Table 2.3), includes activities which individuals undertake to try and personally improve environmental quality. Examples include recycling and using public transit:

> Well, I have my blue box, I'm proud of it. I don't smoke in front of people who don't. You know, things like that... And I don't litter... So I'm doing a fair bit of doing the small things. ("Monique" - 45 years old, 20 year resident)

> When we moved down here we went from 2 vehicles to 1 vehicle. I ride my bike to work or I take the bus to work. My husband has to drive... but we do our part to contain it. I recycle every single thing I could possibly recycle, and everybody laughs at me because I have four recycling bins. I use phosphorous-free laundry soap... I don't dump chemicals in the sewers. ("Sue" - 35 years old, 4 year resident)

Personal change strategies allowed respondents to help manage pollution and influence environmental quality through their own actions. 'Environment' is seemingly defined broadly by respondents (see also James and Eyles, 1999), with air quality being viewed as part of a cohesive whole:

> Air pollution is all part and parcel of everything. If they are going to straighten up the whole works of it, great, air pollution will fall in its place. ("Albert" - 70 years old, 5 year resident)

This may explain why several of the "personal changes" mentioned have at best a limited connection to air quality (e.g. recycling), yet respondents consistently

mentioned these actions when asked what they had done in relation to air pollution. Conversely, some respondents may not have reported personal changes such as recycling if they felt that they were not relevant to air pollution: in this case, personal change associated with environmental concern in general may be under-reported.

A portion of those interviewed reported taking what may be called individual civic action (Table 2.3). These actions included complaining to government or industry about local air pollution, or signing petitions about the issue:

> I've signed petitions and stuff. Never organized anything though - I've never done anything like that. ("Angela" - Paul's wife, 50 years old, 24 year resident)

> I phone them up, if I'm not happy about something I'll phone up and I have phoned in radio stations sometimes about things you know or T.V., and just voice an opinion. ("Eleanor" -Albert's wife, 70 years old, 5 year resident)

An even smaller proportion of respondents had been involved in group civic action, such as active participation in an environmental group (Table 2.3):

> We helped start [a neighbourhood environmental group]. ("Beverly" - 45 years old, 25 year resident)

2.5.4 The roles of attachment to place and social capital

The third objective of this research was to explore the contributions of place attachment and social capital to our understanding of environmental action in the study community. With respect to the former, some respondents were not particularly attached to their neighbourhoods, citing air pollution, crime, and other environmental problems as reasons for their dislike. However, a slightly larger

proportion (Table 2.4) of respondents felt very attached to their communities, despite their various problems:

> It's a good neighbourhood. Our families are in the east end. We've had some pretty good friends here. This is a nice little area. ("Paul" - 55 years old, 24 year resident)

> It's quiet...friendly...and nice. It's nice. I raise my son here. He has lots of friends around here. I like the neighbourhood. Lots of pollution. I've lived here 20 years. This is the longest I've stayed put. So I love this place. ("Monique" - 45 years old, 20 year resident)

> There's a lot of people that like the north end still. They want to live down here. ("Barb" - 40 years old, lifetime resident)

This attachment to North End neighbourhoods did seem to play some role in the development of action around poor air quality. That is, all respondents who reported taking civic action (either as individuals or in groups) also reported feeling attached to their neighbourhood (Table 2.4). However, not all individuals who felt attached to their neighbourhoods actually took civic action - in fact, more than half of those who felt attached to their neighbourhood did *not* take this kind of action. Instead, some individuals who were attached to their neighbourhood accepted local problems as the price of staying in a community they otherwise enjoyed living in. A few respondents even reported becoming accustomed to poor air quality,

> What happens is you get used to your environment so you don't really smell it or anything. ("John" - 60 years old, 24 year resident)

which might further reduce their desire to take action.

Similarly, all respondents who reported taking civic action around community air quality also reported previous involvement in the community through school

and/or neighbourhood organisations (one measure of social capital) (Table 2.4). Unlike place attachment however, few respondents who reported community involvement reported that they had *not* taken some sort of civic action to deal with air pollution. Indeed, all of these respondents mentioned that they had at least *considered* participating in environment-related civic action, either through their existing organisations or in other capacities.

Those respondents who reported being active in local organizations (Table 2.5) were quick to note the importance of an existing group in facilitating their own participation, as well as encouraging others to get involved:

> We got over 200 people signed up in a matter of a week or so. And once they knew we were doing petitions and what not, and doing the neighbourhood, all out there door to door, people became very interested. And I think when they realized that someone was planning on doing something about this they decided to sign on.
> *Interviewer: So you think people are more likely to take action when there's a group of people as opposed to just individually doing something?*
> Yeah, I think when you've got a group... strength in numbers.
> ("Joan" - 40 years old, lifetime resident)

They also noted initiatives in the local community seemed to "feed" one another, and that what began as a small group of concerned citizens could "spin off" into other organizations representing different segments of the community:

> Well, with the [neighbourhood environmental group], by one person going around with a petition, from that petition having a meeting at the school, and from that school we formed a committee, and from that committee went to our local government with regards to the black soot. And then they came and they formed the [air quality task force]. All of that's been spin off and there's a lot of people working on that sort of thing... So what started out as something small, there

> was a domino effect which I think is good. ("Beverly" - 45 years old, 25 year resident)

Still, most respondents did *not* become involved in environmental action. Three main reasons were cited for their lack of involvement. First, respondents felt that they had other more important priorities and commitments, and that these were competing demands for their resources:

> I don't have a lot of time to spend on those issues. I know they're important, but when you've got a house full of kids coming and going... you've got other top priority things. ("Heather" - 35 years old, 4 year resident)

> When you work you don't have much time to do that kind of stuff, cause I'm not around here to do it. ("John" - 60 years old, 24 year resident)

Second, and perhaps more importantly, respondents felt powerless to influence a problem as large and ubiquitous as air pollution:

> I don't have the time and I don't have the resources and unfortunately I think [that] a common feeling amongst everyone is that being just a person in the crowd, you don't think that a lot of your efforts could be that substantial to make that much of a difference. You know, what could I do to make [the steel companies] change the way that they pollute the air? What am I going to do as far as this huge thing? ("Peter" - 50 years old, 15 year resident)

> One person standing up and screaming from the roof tops, that's not going to change it because one person doesn't have enough power to wield to make them listen. ("Albert" - 75 years old, 5 year resident)

For some respondents, this sense of powerlessness was associated with the 'stigma' (Edelstein, 1987) of living in their area, and to ongoing difficulties getting other complaints resolved. These respondents felt that the poor reputation of their

neighbourhood limited the extent to which others (e.g., bureaucrats) were willing to help them address their air pollution (and other) concerns:

> ... nobody'd live down here. You got to be a fool to live down here. That's why people call [Hamilton] the Smog City and that... It's like "why do we want to go to Hamilton, why would we want to visit there knowing that it's a very bad area for the environment?" This is the worst place, the worst place. And we are the worst area... [Nobody] cares though. We can't even get a hold of the Alderman half the time around here. Even the post office delivers by truck - they wouldn't walk up this far. The ad companies don't drop anything off here. They don't do nothing about down here at all. It's amazing that the city even cuts the grass. Like I said, they don't care! They don't care about nobody but themselves... we can only do so much to push the issue. ("Bill" - Barb's partner, 40 years old, lifetime resident)

Finally, respondents mentioned that they had difficulty envisioning civic actions they could take in relation to air pollution, because of a lack of pertinent information about the problem and about how to contact those responsible for monitoring it:

> You don't really know who to call. I guess you can call your councilman and stuff, but you really don't. ("Mary" - 60 years old,11 year resident)

> If I had somebody's phone number they'd be getting a call from me..and start making some noise and saying "hey, hold on a minute here"... if I knew who to call and who to speak with, you bet. ("Heather" - 35 years old, 4 year resident)

Those respondents who were active in local community groups, and even some of those not active but aware of the activities of groups in their community, did not report the same feelings of powerlessness, and seemed more comfortable with the steps necessary to contact government and other representatives about air pollution, or to contact relevant community organisations:

> Since the Beach Committee formed... we're trying to beautify the beach. Pollution gets thrown around, and of course, we need a phone number to call. So that's how we got the number. Somebody tracked it down. ("Bob" - 30 years old, lifetime resident)

2.6 DISCUSSION AND CONCLUSION

Within the study community, air pollution risk perception was influenced by everyday life experiences, particularly the sensate nature of the exposure (i.e. the ability to see, smell, touch, and even taste air pollution), and was sensitive to geographic and temporal variation. Phillimore and Moffat (1994; see also Moffatt et al., 1995) documented similar resident experiences in an industrial town in northeast England. Similar to results reported by Greenberg and Schneider (1996) in their survey of "environmentally devastated neighbourhoods", air pollution was assigned varying levels of priority by different households based on the presence and perceived severity of *other* socio-environmental risks (e.g. crime). This research, therefore, provides additional support for results found in previous work on environmental risk perception, and accentuates the importance of "insider" perceptions and prioritizations of environmental quality issues to both theory and policy.

Four types/categories of active responses to environmental risk were identified here (i.e., reappraisal of lifestyle options, personal change, individual civic action, and group action). These actions vary both in the numbers of respondents using them, and the benefits (both personal and societal) derived from their use.

Action around air pollution was widespread in the study area; residents modified their behaviour in numerous ways to try and deal with poor air quality. However, most actions were taken to reduce the impacts of exposure on everyday life; the proportion of respondents involved in activities (particularly group activities) to try and reduce the exposure itself was quite small (n=5 and 2 out of 21, respectively). Some actions seen here are more effective than others in creating positive change and developing local empowerment. For example, actions which involve personal change, such as recycling, served in many cases to increase respondent sense of control. However, these actions appear quite limited in their ability to influence local air quality. In addition, the skill development and political engagement associated with collective action (Rochon, 1998) were lacking. On the other hand, collective civic actions, such as participation in issue-related organisations, can promote individual empowerment and help re-distribute decision-making power within the community (Rochon, 1998; Ife, 1995; Rissel, 1994). They also facilitate the development of social capital by creating links between community members (Rissel, 1994; Hallman and Wandersman, 1992). Based on existing literature and the results of this research, a taxonomy of environmental action can therefore be suggested (Table 2.6). Previous investigations of environmental action have tended to rely on early expositions of this concept (e.g. Arnstein, 1969; Langton, 1978), which are perhaps better applied to traditional political participation. These models cannot deal with the full range of actions taken in response to environmental exposures, for two

reasons. First, they fail to account for the expanding avenues of and venues for participation in contemporary society, many of which fall outside the realm of traditional political action (Brown, 1997). Second, these models cannot account for the particularly intrusive nature of environmental pollution, which impinges on daily life in affected communities to such an extent that *some* response to the exposure (although not necessarily a political one) is required. The categorisation of environmental action hypothesized here, therefore, overcomes these limitations and provides a step forward in our understanding of action around environmental issues.

When this categorization is applied to the responses recorded here, it emerges that the more useful an action is in creating positive change, the *less* likely it is that residents are able to take that action; that is, participation appears to be inversely related to an action's effectiveness in initiating change to improve local health. This cannot be explained solely by the level of difficulty associated with the action because, while involvement in group civic action may require a large time or resource commitment, so may the reappraisal of lifestyle options (e.g. purchasing and installing an air conditioner), and certain rarely reported actions (e.g. phoning the air pollution "hotline" or signing a petition) generally require *less* time and resources. This observation presents a challenge to theorists, since in the past it has generally been assumed that the sacrifices associated with civic action were a major factor inhibiting participation. If this is not the case, a more nuanced understanding of the factors which promote or inhibit civic action needs to be developed. This finding poses an additional challenge to policy-makers and health promoters, since initiatives

designed to make civic action "easier" may have limited effects. Instead, policy-makers may need to grapple with the difficult issues surrounding individual and structural barriers to participation (Eyles, 1993) in order to develop more effective "public participation" initiatives.

Participation in civic action was limited by a number of these individual and structural barriers (Eyles, 1993), including the stigma associated with particular neighbourhoods and a lack of knowledge of whom to contact in relation to air pollution and how to make contact with them. The absence of information reported here could be seen as a further reflection of a lack of social capital, since the networks necessary to facilitate the transfer of this information within the community are missing (or at least inaccessible to these respondents). In the cases where respondents were actively involved in, or even just aware of, these networks, they reported increased personal involvement in air quality issues, as well as increased involvement within the wider community as a result of recruitment. In addition, low perceived self-efficacy and sense of control minimized action-taking; that is, residents who felt that the effectiveness of any civic action they took would be limited because of their own perceived powerlessness were unlikely to undertake these actions. This has important implications for policy development, since any initiative would need to overcome the widespread perception that community action, particularly in disadvantaged neighbourhoods, is doomed to fail.

One factor of potential importance in environmental action, place attachment, was found in this research to have some effect on civic action. Satisfaction with and

attachment to neighbourhood varied among respondents, and all respondents who took civic action reported feeling attached to their neighbourhoods. However, many other respondents who reported neighbourhood attachment were ambivalent about the need to make change. Place attachment, therefore, can be seen as a *necessary* but not *sufficient* condition for civic action.

The presence of social capital (as evinced by previous involvement within the community) seemed to play a larger role in facilitating action. Again, all individuals who reported civic action also reported some formal involvement in their local community networks; however, almost all of those reporting this kind of community involvement also reported having taken civic action around poor air quality in this neighbourhood. Further, individuals who were involved with community groups seemed to have a greater willingness to try and make change, and were more convinced of their own power to do so. Social capital, therefore, may represent one way in which the general sense of powerlessness surrounding environmental issues may be overcome.

There is a large and obvious overlap between respondents reporting place attachment and group involvement in this research. This is likely due to the mutually reinforcing nature of social capital and place attachment; that is, residents who are attached to their neighbourhoods may be more likely to choose to become involved in local activities, and those who are involved in such activities may feel more attached to their neighbourhoods as a result. Certainly, the sense of "belonging" in a place (associated with place attachment) could be heightened as a result of local

involvement. However, this attachment could also develop as a result of other factors (e.g. long term residence in a neighbourhood).

Overall, the results of this research indicate that, while social capital and place attachment are inextricably linked, social capital seems to have a greater effect in stimulating civic action around environmental degradation in a community. This research therefore lends support to existing theory in this area, which suggests that social capital is a primary facilitator of civic action in other (primarily political) contexts (Putnam, 1993). However, the role of other facets of social capital (beyond formal community involvement) remain unclear; more research is needed to examine the role of informal involvement in the community, and to determine the role of social trust in civic action-taking. This paper also provides additional confirmation of the important role that subjective, local perceptions play in the development of concern and action around environmental risks, thereby highlighting the need for policy which is sensitive to local differences.

2.7 ACKNOWLEDGMENTS

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2.8 REFERENCES

Abel, R. (1995) 'Contested communities', *Journal of Law and Society,* 22, pp. 113-148.

Adams, John. (1995) *Risk*, London: UCL Press.

Altman, I. and Low, S.M. (eds.) (1992). *Place Attachment*, New York: Plenum Press.

Arnstein, S. (1969) 'A ladder of citizen participation', *Journal of the American Planning Association,* 35, pp. 216 - 224.

Baxter, J., Eyles, J.D. and Elliott, S.J. (1999a) ' "Something happened": the relevance of the 'risk society' for describing the siting process for a landfill', *Geografiska Annaler,* 81, pp. 91 - 109.

Baxter, J., Eyles, J.D. and Elliott, S.J. (1999b) 'From siting principles to siting practices: a case study of discord among trust, equity and community participation', *Journal of Environmental Planning and Management*, 42 (4), pp. 501 - 525.

Beck, U. 1992. *Risk Society: Towards a New Modernity.* London: Sage.

Brown, P. and Ferguson, F.I.T. (1995) ' "Making a big stink": women's work, women's relationships, and toxic waste activism', *Gender and Society* 9 (2), pp. 145 - 172.

Brown, M.P. 1997. *RePlacing Citizenship: Aids Activism and Radical Democracy.* New York: Guilford Press.

Burnett, R.T., Cakmak, S., and Brook, J.R. (1998) 'The effects of urban ambient air pollution mix on daily mortality rates in 11 Canadian cities', *Canadian Journal of Public Health,* 89, pp. 152 - 156.

Chavis, D.M., and Wandersman, A. (1990) 'Sense of Community in the Urban Environment: A Catalyst for Participation and Community Development', *American Journal of Community Psychology*, 18, pp. 55-81.

David Suzuki Foundation. (1998) *Taking Our Breath Away: the Health Effects of Air Pollution and Climate Change*, Climate of Change Series, Vancouver, Canada.

Douglas, M. and A. Wildavsky. (1982) *Risk and Culture*, Berkeley: University of California Press.

Dunlap, R.E., G.H. Gallup Jr. and A.M. Gallup. (1992) *Health of the Planet: Results of a (1992 International Environmental Opinion Survey of Citizens in 24 Nations*, Princeton, NY: George H. Gallup Institute.

Edelstein, M.R. (1987) 'Toward a Theory of Environmental Stigma', in Henry, J. and Henning, D. (eds), *Public Environments*. Ottawa: Environmental Design Research Association, pp. 21-25.

Eisenhauer, B.W., Krannich, R.S., and Blahna, D.J. (2000) 'Attachments to special places on public lands: An analysis of activities, reasons for attachments, and community connections', *Society and Natural Resources*, 13 (5), pp. 421 - 441.

Elliott, S.J. (1999) 'Qualitative approaches in health geography: Introduction', *Professional Geographer*, 51 (2), pp. 230 - 232.

Elliott, S.J., Cole, D.C., Krueger, P. et al. (1999) 'The power of perception: health risk attributed to air pollution in an urban industrial neighbourhood', *Risk Analysis,* 19 (4), pp. 615 - 628.

Elliott, Susan .J., P. Krueger, D.C. Cole, et al. (1997). *Perceptions of Air Pollution: The North Hamilton Survey*. Hamilton: Hamilton-Wentworth Air Quality Initiative/McMaster University Environmental Health Program.

Elliott, Susan J., Taylor, S.M., Hampson, Christine, et al. (1997b). ' "It's not because you like it any better...": residents perceptions of a landfill site', *Journal of Environmental Psychology*, 17, pp. 229-241.

Eyles, J. (1998) 'Interpretive Approaches in Health Research', in Elliott, S.J. (ed), *Qualitative Analysis in Process Evaluation for Heart Health Promotion.* Conference Proceedings. February 25-27. (Population Health Fund, Health Canada).

Eyles, J. (1993) *The Role of the Citizen in Health Care Decision-Making*, McMaster University Centre for Health Economics and Policy Analysis Policy Commentary C93-1, June.

Eyles, J. (1985) *Senses of Place*, Warrington: Silverbook Press.

Finger, M.(1994) 'From knowledge to action? Exploring the relationships between environmental experiences, learning, and behavior', *Journal of Social Issues*, 50 (3), pp. 141-160.

Fischhoff, B., Slovic, P. and Lichtenstein, S. (1981) 'Lay foibles and expert fables in judgements about risk', in Riordan, T. and Turner, R. (eds.), *Progress in Environmental Resource Management and Environmental Planning*, Chichester: Wiley.

Fischhoff, B., Svenson, O., and Slovic, P. (1987) 'Active Responses to Environmental Hazards: Perception and Decision-Making', in Stokols, D. and Altman, I. (eds), *Handbook of Environmental Psychology*, New York: Wiley and Sons. Vol. 2, pp. 1039 - 1133.

Freudenberg, N. and Steinsapir, C. (1991) 'Not in our backyards: the grassroots environmental movement', *Society and Natural Resources,* 4 (3), pp. 235-245.

Greenberg M. and Schneider, D. (1997) 'Neighborhood quality, environmental hazards, personality traits, and resident actions', *Risk Analysis*,17 (2), pp. 169-175.

Greenberg, R., and Schneider, D. (1996) *Environmentally Devastated Neighborhoods,* New Brunswick, NJ: Rutgers University Press.

Habermas, Jurgen. (1984) *The Theory of Communicative Action*, Boston: Beacon Press.

Hallman, W.K. and A. Wandersman. (1992) Attribution of responsibility and individual and collective coping with environmental threats, *Journal of Social Issues*, 48 (4), pp. 101 - 118.

Hamilton Air Quality Initiative (1997a) *Summary Report,* Hamilton: Regional Municipality of Hamilton-Wentworth.

Hamilton Air Quality Initiative (1997b) *Aesthetics, Odour, and Economic Aspects of Air Quality in Hamilton-Wentworth,* Hamilton: Regional Municipality of Hamilton-Wentworth.

Hamilton Air Quality Initiative (1997c) *Human Health Risk Assessment for Priority Air Pollutants,* Hamilton: Regional Municipality of Hamilton-Wentworth.

Hughes, Rick. 'Bad air a "health crisis": doctors urge immediate action', *Hamilton Spectator*, May 13, 1998: A1.

Hayes, M. (1999) ' "Man, disease, and environmental associations": from medical geography to health inequalities', *Progress in Human Geography*, 23 (2), pp. 289-296.

Heiman, M.K. (1997) 'Community attempts at sustainable development through corporate accountability'*Journal of Environmental Planning and Management,* 40, pp. 631-643.

Herron, Shaun N. (1996) 'How safe is your neighbourhood?: Incidents of key crimes in Hamilton-Wentworth in 1995', *Hamilton Spectator* (Monday May 13): B1.

Hummon, D.M. (1990) *Commonplaces: Community Ideology and Identity in American Culture*, Albany: State University of New York Press.

Hummon, D.M. (1992) 'Community attachment: local sentiment and sense of place', in Altman, I., and Low, S.M. (eds), *Place Attachment*, New York: Plenum Press, pp. 1 - 12.

Ife, J. (1995) *Community Development,* Melbourne: Longman.

James, J. and Eyles, J.D. (1999) 'Perceiving and representing both health and the environment: an exploratory investigation', *Qualitative Health Research*, 9 (1).

Kawachi, I.., Kennedy, B., Lochner, K., and Prothrow-Stith, D. (1997) 'Social capital, income inequality, and mortality', *American Journal of Public Health*, 87, pp. 1491-1498.

Kelly, P.F. (1994) 'Towanda's triumph: social and cultural capital in the transition to adulthood in the urban ghetto', *International Journal of Urban and Regional Research*, 18: 88 - 111.

Kufrin, K. (1995) 'Environmental attitudes and behavior: a missing link', *Socijalna Ekologija*, 5 (1), pp. 1 - 20.

Langton, S. (ed.) (1978) *Citizen Participation in America*, Lexington, Mass..: D.C. Health.

Lazarus, R.S. (1993) 'Coping theory and research: past, present, and future', *Psychosomatic Medicine*, 55, pp. 234-247.

Lazarus, R.S. and S. Folkman. (1984) *Stress, Appraisal, and Coping*, New York: Springer.

Levi, M. (1996) 'Social and unsocial capital: A review essay of Robert Putnam's **Making Democracy Work**', *Politics and Society,* 24, pp. 45-55.

Lipshutz, R.D. (1996) *Global Civil Society and Global Environmental Governance*, Albany: SUNY Press.

Lober, D.J. (1995) 'Why protest? Some public behavioural and attitudinal responses to siting a waste disposal facility', *Policy Studies Journal*, 23 (3), pp. 499-518.

Lomas, J. (1998) 'Social capital and health: implications for public health and epidemiology', *Social Science and Medicine,* 47 (9), pp. 1181-1188.

McDowell, L. (1997). *Undoing Place?*, London: Arnold.

McHugh, K.E., and Mings, R.C. (1996) 'The circle of migration: attachment to place in aging' *Annals of the Association of American Geographers*, 86 (3), pp. 530 - 550.

Mesch, G.S., and Manor, O. (1998) 'Social ties, environmental perception, and place attachment', *Environment and Behavior*, 30 (4), pp. 504 - 519.

Miles, M.B. and A.M. Huberman. (1994) *Qualitative Data Analysis: a Sourcebook of New Methods* (2nd ed.), Beverly Hills: Sage.

Mittelstaedt, Martin (1999) 'Air quality rules too lax, poll finds', *Globe and Mail* (Tuesday April 20), A10.

Moffatt, S., Phillimore, P., Bhopal, R., and Foy, C. (1995) ' "If this is what it's doing to our washing, what is it doing to our lungs?" Industrial pollution and public understanding in North-east England', *Social Science and Medicine*, 41 (6), pp. 883-891.

Morgan, D.L. (1993) 'Qualitative content analysis: a guide to paths not taken', *Qualitative Health Research,* 3, pp. 112 - 121.

Morgan, G., et al. (1998) 'Air pollution and daily mortality in Sydney, Australia', *American Journal of Public Health*, 88, pp. 759-763.

Ontario Medical Association. (1998. *Ground Level Ozone Position Paper.* Toronto: OMA.

Perkins, D.D., Brown, B.B., and Taylor, R.B. (1996) 'The ecology of empowerment: predicting participation in community organizations', *Journal of Social Issues,* 52, pp. 85-110.

Phillimore, P. and Moffatt, S. (1994) 'Discounted Knowledge: Local Experience, Environmental Pollution, and Health', in Popay, J. and Williams, G. (eds), *Researching the People's Health*, London: Routledge, pp. 134 - 153.

Popay, Jennie. (2000) 'Social capital: The role of narrative and historical research', *Journal of Epidemiology and Community Health*, 54: 401.

Preston, V., Taylor, S.M., and Hodge, D.C. (1983) 'Adjustment to natural and technological hazards: a study of an urban community', *Environment and Behavior*, 15 (2), pp. 143-164.

Putnam, R. (1995) 'Bowling alone: America's declining social capital', *Journal of Democracy,* 6 (1), pp. 65-78.

Putnam, R. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton, NJ: Princeton U.P.

Qiaoming, Amy Liu, Ryan, V., Aurbach, H. and Besser, T. (1998) 'The influence of local church participation on rural community attachment', *Rural Sociology*, 63(3), pp. 432 - 450.

Quinn-Patton, Michael (1990) *Qualitative Evaluation Methods* (2nd ed.), Bevery Hills: Sage.

Richards, L. and Richards, T. (1994) 'From Filing Cabinet to Computer', in Bryman, A., and Burgess, R.G. (eds), *Analyzing Qualitative Data*, London: Routledge.

Rissel, C. (1994) 'Empowerment: the holy grail of health promotion?' *Health Promotion International*, 9, pp. 39-47.

Rochon, T.R. (1998) *Culture Moves: Ideas, Activism, and Changing Values.* Princeton, NJ: Princeton UP.

Rose, R. (2000) 'How much does social capital add to individual health? A survey study of Russians', *Social Science and Medicine*, 51 (9), pp. 1421 - 1435.

Seguin, C., Pelletier, L.C., and Hunsley, J. ((1998). Toward a model of environmental activism. *Environment and Behavior, 30,* 628-652.

Schwartz, Joel. (1994) 'Air pollution and daily mortality: a review and meta-analysis', *Environmental Research*, 64, pp. 36 - 52.

Slovic, P. (1987) 'Perception of Risk', *Science*, 236: 280 - 285.

Strauss, A. and J. Corbin. (1990) *Basics of Qualitative Research: Grounded Theory Procedures and Techniques,* Newbury Park: Sage.

Tranter, B. (1996) 'The social bases of environmentalism in Australia', *Australian and New Zealand Journal of Sociology,* 32(2), pp. 61-85.

Wakefield, S. (1998) *Psychosocial Impacts of the Landfill Siting Process in Two Southern Ontario Communities*. M.A. Thesis. Hamilton, ON: School of Geography and Geology, McMaster University.

Wakefield, S. and Elliott, S.J. (2000) 'Environmental risk perception and well being: effects of the landfill siting process in two Southern Ontario communities', *Social Science and Medicine*, 50, pp. 1139 - 1154.

Walsh, E., Warland, R., and Smith, D.C. (1993) 'Backyards, NIMBYs and incinerator sitings: implications for social movement theory', *Social Problems*, 40 (1), pp. 25-38.

Wilkinson, R.G. (1996) *Unhealthy Societies: The Afflictions of Inequality*, London: Routledge.

Wilkinson, R.G. (1997) 'Health inequalities: relative or absolute material standards?' *British Medical Journal*, 314, pp. 591 - 595.

TABLE 2.1:
Characteristics of the Interview Participants

Characteristics	Interview Participants (n = 21)	Initial Survey Respondents (n = 402)	Study Area [1, 2]	City of Hamilton[2]	Region of Hamilton-Wentworth[2]
% Female	47	50	50	51	51 [3]
% Canadian born	95	77	78	76	80
% English at home	95	91	77	82	80
% with less than high school education	32	23	56	43	40
% Low income (<$30,000)	26	25	42	30	26
Mean # persons per household	3	3	3	3	3
% Households with children	42	44	43	48	47
% Homeowners	79	71	64	64	62
% Smokers	42	39	n/a	34 [4]	27 [4]

Notes:
1. Calculated by aggregating data from census tracts which correspond to the study area (51-61, 67-71, 73).
2. Source unless otherwise noted: Statistics Canada, 1991 Census.
3. Source: Ontario Ministry of Health Morbidity and Mortality Report, 1992.
4. Source: Hamilton-Wentworth Health Survey, 1995.

N/A: data not available.

TABLE 2.2:
Air Pollution Concerns

Type of Concern	**# of Interviews in which mentioned (n=21)**
Health	15 (71%)
Inconvenient lifestyle impacts	13 (62%)
Haze and odour annoyance	10 (48%)
Environmental damage	6 (29%)
No concerns mentioned	5 (24%)
Note: more than one type of concern could be mentioned in each interview	

TABLE 2.3:
Reported Environmental Actions

Action	**# of Interviews in which mentioned (n=21)**
No action taken	3 (14%)
Reappraisal of lifestyle options	17 (81%)
Personal change	6 (29%)
Individual civic action	5 (24%)
Group civic action	2 (10%)
Note: more than one type of action could be mentioned in each interview	

TABLE 2.4:
Respondents Reporting Place Attachment, Community Involvement, and Civic Action

Place Attachment and Civic Action			
	Attachment	No Attachment	*Total*
Action	5 (24%)	-	*5 (24%)*
No Action	7 (33%)	9 (43%)	*16 (76%)*
Total	*12 (57%)*	*9 (43%)*	*21 (100%)*
Community Involvement and Civic Action			
	Involvement	No Involvement	*Total*
Action	5 (24%)	-	*5 (24%)*
No Action	2 (10%)	14 (67%)	*16 (76%)*
Total	*7 (33%)*	*14 (67%)*	*21 (100%)*

TABLE 2.5:
Types of Reported Community Involvement

Type of Involvement	**# of Interviews in which mentioned (n=21)**
Community Volunteer	3 (14%)
School Volunteer	5 (24%)
Involved with sports team(s)	3 (14%)
Not involved	11 (52%)
Note: more than one type of involvement could be mentioned in each interview	

TABLE 2.6:
A Taxonomy of Environmental Action

Action Category	Characteristics	Examples	# Respondents Reporting Action (n=21)
Reappraisal of lifestyle options	- reactive not pro-active - no associated psychological benefits - no social component	- increased cleaning - staying indoors - not hanging laundry outside - air conditioner purchase	17
Personal change	- pro-active - some psychological benefit -no social component - relatively easy to undertake	- recycling - keeping car/furnace in tune - use of alternative transit (bus or bicycle)	6
Individual civic action	- reactive or pro-active - some psychological benefit - some social component - relatively difficult	- complaints to industry, government, or the media (writing, telephoning, etc) - voting	5
Group civic action	- pro-active - large psychological benefit - large social component - very difficult/time consuming	- attending public meetings and/or protests - joining community opposition groups - petitions	2

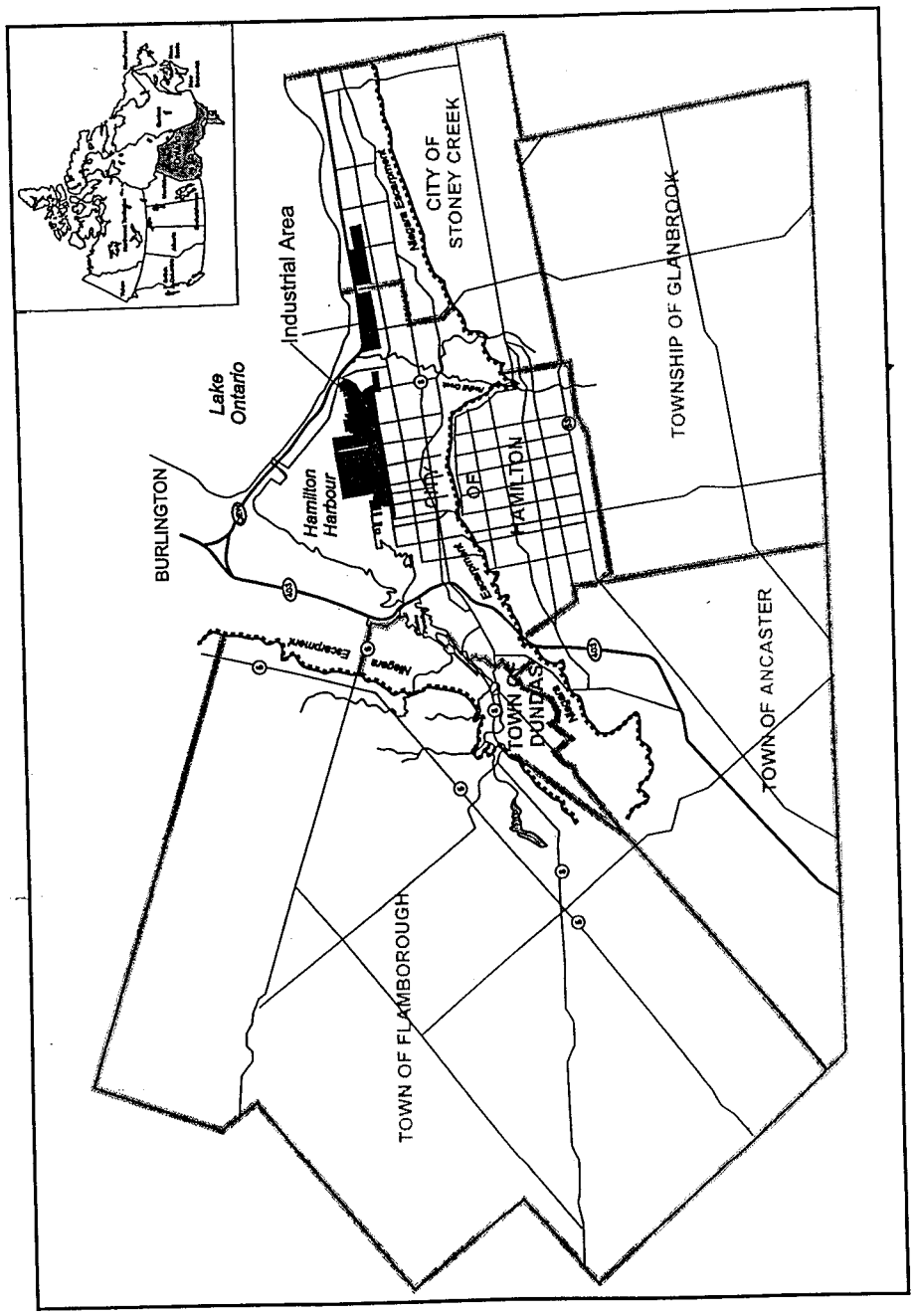

FIGURE 2.1:

Hamilton-Wentworth

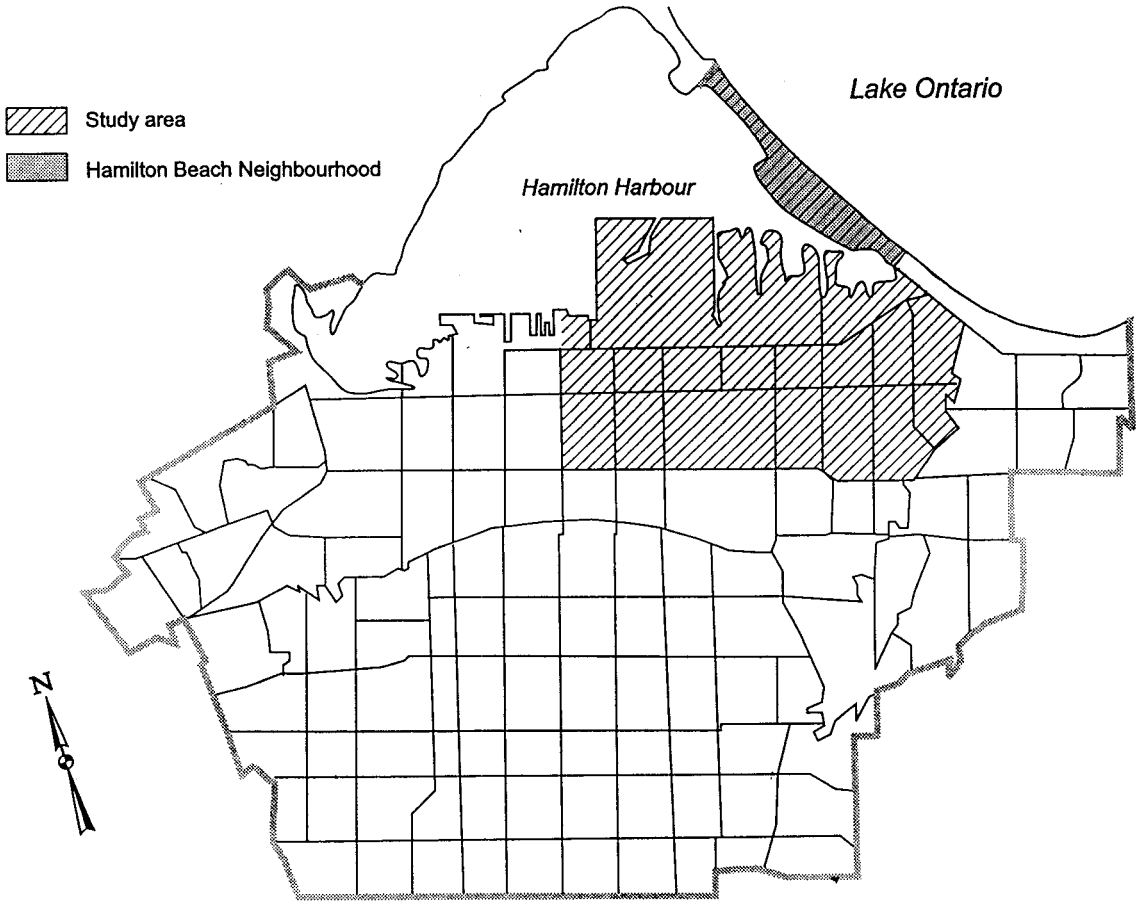

FIGURE 2.2:

North Hamilton Study Area, Including Hamilton Beach

CHAPTER 3

ENVIRONMENTAL CONCERN AND CIVIC ACTION: A CASE STUDY

Sarah E.L. Wakefield[1], Susan J. Elliott[1,2], Donald C. Cole[2,3] and John D. Eyles[1,2]

[In review with **ENVIRONMENT AND BEHAVIOR**]

ABSTRACT

This paper presents results from a study investigating predisposition and capacity for civic action around environmental concerns, using the issue of air pollution in Hamilton, Canada, as a case study. The paper has three objectives: to lay out a conceptual framework to guide environmental action research; to characterize pre-selected communities within Hamilton in relation to the components of the conceptual framework (i.e., socio-demographic characteristics, social networks, and environmental perception; predisposition and capacity; and environmental action); and to identify bivariate determinants of civic action taken in response to environmental concerns. To address these objectives, a survey was administered to 512 households in five areas within Hamilton. While substantial variation between communities was observed in terms of aggregate individual characteristics, little variation in social network characteristics and environmental action between areas was observed. Predictors of environmental action are identified through bivariate analysis, including a number of factors related to the characteristics of the environmental exposure and the social context in which respondents live. These results highlight the importance of contextual factors, both environmental and social, to civic action.

Keywords: environmental risk perception, air pollution, civic action

[1] School of Geography and Geology, McMaster University, 1280 Main St. W., Hamilton, ON L8S 1K4; email correspondence to swakefie@mcmaster.ca

[2] Institute of Environment and Health, McMaster University, 1280 Main St. W., Hamilton, ON L8S 1K4

[3] Department of Public Health Sciences, University of Toronto, 12 Queen's Park Cresent W., McMurrich Building, Toronto, ON M5S1A8

3.1 INTRODUCTION

There is a substantial and growing literature in geography and other social sciences which describes the impacts of environmental exposures on individuals and communities (Cutter, 1994; Edelstein and Wandersman, 1987; Edelstein, 1988). This work has emphasized risk and risk perception (e.g. Kasperson et al., 1988; Wildavsky and Dake, 1990), physiological health impacts (e.g., Hertzman et al., 1987; Brooks et al., 1995), and psychosocial health impacts (e.g. Elliott et al., 1993; Elliott and Taylor, 1996), in relation to a number of different environmental exposures. In general, this work has been focused on identifying the ways individuals and communities cope with environmental risks.

Recently, interest in questions of *process* around environmental decision-making has been increasing (Wakefield and Elliott, 2000; Baxter et al., 1999a, 1999b). In particular, civic action as a response to perceived pollution has emerged as a important factor for further study (Greenberg and Schneider, 1997; Elliott et al., 1999; Wakefield et al., 2001), given that it has the potential not only to result *from* environmental change, but to result in (hopefully positive) environmental change. Much of the research in geography has been concerned with the relevance of environmental action-taking to new social movement theory (Rios, 2000; Kousis, 1999; Walsh et al., 1993) and environmental justice (Bowen et al, 1995; Harvey, 1996; Jerrett et al., 1998; Jerrett et al., 2001; Cannan, 2000; McGurty, 2000). These literatures stress the importance of collective civic action as a mechanism for social and environmental change (e.g. McPhee, 1996; Martin, 1997; Prato, 1993).

However, this literature has generally failed to address questions concerning the *determinants* of civic action around environmental concerns; that is, who takes environmental action, and why (Greenberg and Schneider, 1997).

The fields of environmental and social psychology have been more prolific in their investigations of issues related to motivation for and deterrents to environmental action-taking (Gardner and Stern, 1996; Fransson and Garling, 1999; McGee, 1999). However, this research has tended to emphasize the individual (Zelezny and Schultz, 2000), despite the potential relevance of both ecological and interpersonal factors to environmental action-taking (for example, existing environmental conditions and neighborhood social networks, respectively).

The purpose of this paper, then, is to begin to draw together these disparate bodies of theory and research, in an attempt to develop a more thorough conceptualization of environmental action and its determinants. To explore these issues, this paper uses data from a community survey to examine intra-urban variation in air quality perception, concern, and action in Hamilton, Ontario, Canada (Figure 3.1). The paper has three objectives: first, to lay out a conceptual framework to guide the research and inform environmental action research more generally; second, to characterize pre-selected communities within Hamilton in relation to the components of the conceptual framework (i.e., socio-demographic characteristics, social networks, and environmental perception; predisposition and capacity; and environmental action); and finally, to identify bivariate determinants of civic action taken in response to environmental concerns. The paper therefore begins by

developing the conceptual framework for the research. The study design is then outlined, along with a brief discussion of the overall research context and the selection of the study communities. This is followed by the characterizations of these communities, and the results of bivariate analyses of the survey data. Conclusions are discussed in relation to their relevance to theory and policy around civic action as a response to environmental problems, and finally, next steps in the research program are outlined.

3.2 THE DETERMINANTS OF ENVIRONMENTAL ACTION: A CONCEPTUAL FRAMEWORK

This research attempts to link geographic and psychological theory by focusing on local communities as the context for understanding the relationship between environmental issues and civic action taken in response to these issues. This contrasts with more traditional approaches to environmental behavior which generally focus on individuals as autonomous decision-makers (Corraliza and Berenguer, 2000). While communities need not be geographically concentrated (Massey, 1994; Eyles, 1985; Israel et al., 1994), this research centers on place-based communities, because considerable social interaction still occurs at the local level (Kling, 1993), and because individuals have direct experience with environmental impacts at the local level. Environmental damage occurs in specific places (in backyards, neighborhoods, and communities), affecting residents' lives and histories (Lipshutz, 1996; Edelstein and Wandersman, 1987), and thereby potentially

providing a basis for civic action (Chavis and Wandersman, 1990; Freudenberg and Steinsapir, 1991). This paper, then, attempts to ground the investigation of environmental action in specific environmental and social contexts, by laying out a framework for data collection and analysis which includes social and environmental factors.

Many existing investigations of civic action have focused on one determinant (for example, gender - Mohai, 1992; Brown and Ferguson, 1995) or on one class of variables to interpret environmental action (Dietz et al., 1998). While this research is useful in answering questions about specific relationships, it does not provide a comprehensive picture of the factors influencing environmental action. This has led to recent calls (e.g., Stern, 2000, 418) for "synthetic theories or models that incorporate variables from more than one of [these] broad classes". To this end, the paper presents a conceptual framework (Figure 3.2) to structure this investigation of environmental action. This framework was developed from the geography, political science, and to a more limited extent the psychology literatures. In particular, research related to risk perception (Slovic, 1987; Powell and Leiss, 1997) and the individual and community impacts of environmental exposures (Baxter, 1999; Elliott et al, 1993; Luginaah et al, 2000) was used to inform the selection of determinants to be investigated. The framework was also informed by the results of an initial qualitative phase of research (Wakefield et al., 2001). It should be noted that while this conceptual framework is compatible with others in the literature, it is relatively crude in its expression of certain psychological constructs. What this model can add,

however, is a discussion of contextual factors which are rarely encountered in the psychological literature, and a schematic for looking at these variables in relation to other elements of interest.

In the conceptual framework presented in the paragraphs following, a number of pre-existing, mutually interdependent *characteristics* (i.e. of the exposure, individual, social network and wider community) set the stage for environmental action (Figure 3.2). These characteristics, and their inter-relations, can affect both *predisposition* (i.e. motivation reflected by values, beliefs and attitudes) and *capacity* (i.e. skills and resources that empower individuals and communities) to take action (Green and Kreuter, 1991). Predisposition and capacity *mediate* the relationship between characteristics of the person/environment/community and the likelihood and type of *environmental action* taken. These relationships are elaborated below.

3.2.1 Characteristics of Interest

Characteristics of the *individual* (e.g., age, education, occupation, income, ethnicity, and health status) may partially explain environmental action (Walsh et al., 1993; Jones and Dunlap, 1992; Elliott et al., 1999). However, relationships are not necessarily consistent across studies (Tranter, 1996; Berger, 1997), and in general these kinds of ascriptive characteristics have been found to have limited explanatory power in relation to many environmental actions (e.g., Dietz et al, 1998). These factors warrant continued investigation, however, as they provide important

information about an individual's life and history, if not their environmental behavior. In particular, social class (as measured by attributes such as education and income) is considered by many to be a key element in the way individuals experience their world (Kelly, 1994; Wilkinson, 1997). In addition, "class" can be experienced at both an individual and neighborhood level; that is, aggregated socio-demographic characteristics can lead to specific social conditions in an area, which then color individual experiences (Cattell, 2001; Kearns and Parkinson, 2001). Given the focus of this paper on issues related to the intersections of individual and community, these factors may have continued relevance. Similarly, residential status (e.g. housing type, tenure and length of residence - Perkins et al., 1996) can affect residents' perceptions of their community and their place in it, and so may influence both predisposition and capacity to take action around environmental health issues.

In the conceptual framework (Figure 3.2), characteristics of environmental *exposure* are also considered in relation to environmental action. Exposure, while experienced at the individual level, occurs at the ecological level; by explicitly incorporating perceived exposure, this investigation attempts to root individuals within broader (environmental) contexts. Characteristics of the perceived exposure which have been identified in other research as important predictors of concern - which may in turn influence action - include visibility, duration (acute vs. chronic), and intensity (Evans and Cohen, 1987; Darley, 1994; Gould, 1993).

This framework highlights the potential importance of *social networks* to environmental action-taking. Past research has also shown the importance of a

supportive social network in enhancing the ability of individuals to *cope* with environmental stressors (Lazarus and Folkman, 1984), and has suggested that the development of social network ties within a community may be central to the development of local capacity for action (Putnam, 1993; Rochon, 1998). Social networks may be informal (e.g., relationships with neighbors), or more formalized (e.g., involvement in local schools, organized recreational activities, clubs/societies, and other community organizations - Perkins et al., 1996; Foley and Edwards, 1999). The inclusion of social network characteristics into the conceptual framework again provides an opportunity to hypothesize about the links between context (in this case, social context) and individual action.

Not surprisingly, the conceptual framework also incorporates characteristics of the wider *community system/structure*. Characteristics of potential relevance include government regulations (e.g., the presence and local enforcement of environmental protection legislation), policies (e.g., the presence of environmental programs such as recycling), and practices (e.g., the extent to which public participation in local decision-making is encouraged) (MacIntyre et al., 1993; Stern, 2000). These factors which are unlikely to very significantly *within* a particular city/municipality, although variations among cities might be observed. Within an urban system, particular communities or neighborhoods may vary in the level of public service provision, as well as in terms of the reputation or identity a particular community may have (MacIntyre et al., 1993; also see Uzzell et al., 2002). Physical features (e.g., rivers, roadways, scarps) may serve to delineate the borders of specific

communities within a city; additionally, administrative boundaries are often used to identify communities (Bullen et al, 1996). However, community boundaries within an urban area are often fuzzy, ill-defined, and subject to dispute (Kivell et al, 1990; Chow, 1998). The definition of community, and the implications of mis-categorization of communities, has been the subject of much thought and debate in geography and elsewhere (e.g., Kearns and Parkinson, 2001; Cutter et al, 1996; Carr-Hill and Rice, 1995; Reading and Openshaw, 1993). It is not possible to present all the arguments here; suffice it to say that neighborhood characterization should include both objective variation in resident and other characteristics and the intuitive boundaries suggested by community members. Communities, however defined, may be important to environmental action.

3.2.2 Mediators

The relationship between these broad classes of variables and environmental action is not hypothesized as direct. Instead, these variables are thought to affect the development of predisposition and capacity to take action, which in turn influence environmental action-taking. *Predisposition* has been conceptualized in other work as a series of attitudinal factors which influence environmental action. For example, worldviews (Dunlap et al., 2000; Nevitte and Kanji, 1995), values and beliefs (Dietz et al., 1998; Uyeki, 1999), altruistic tendencies (Guagnano et al., 1995; Kaplan, 2000), and orientation towards activism (Koenig, 1975; Finger, 1994) have been related to environmental action taking. These attitudes and perceptions are grounded

in individual circumstances, as well as in social networks and wider community structures and identities: they therefore may be empirically related to the characteristics of the individual and context described above. Also, concern about the environment and local environmental problems may predispose individuals to environmental action, although concern about environmental problems is a poor predictor of environmental action on its own (Seguin et al., 1998; Kufrin, 1995; Finger, 1994; Lober, 1995; Elliott et al, 1993). An individual's level of attachment to place could also serve to predispose environmental action (Vorkinn and Riese, 2001). Communities can provide a focal-point for sentimental and emotional attachment (Hummon, 1990; Altman and Low, 1992); this attachment can be influenced by features of the natural, built and social environments (such as housing type and tenure, access to public services, or exposure to environmental contamination), and also by local social involvement and integration (Hummon, 1992; Rohe and Basolo, 1997). In this framework, predisposition is seen as a necessary but not sufficient determinant of environmental action; that is, predisposition is important to environmental action, but individuals must also have the capacity to take environmental action.

Capacity, then, is also seen as a necessary but not sufficient determinant of action (Figure 3.2). Individual empowerment (a sense of control of one's life and circumstances - Rissel, 1994; Labonte, 1993) is an important component of capacity. A sense of empowerment may result from high relative social status or a high level

of education, as well as from the possession of relevant skills (in the case of collective action, skills related to canvassing, organizing meetings, writing letters, etc. may be important - Ife, 1995). Empowerment is a first step, many theorists assert, in the development of group solidarity and willingness to act around an issue (Rissel, 1994).

Social capital is considered an additional indicator of capacity. "Social capital" refers to the networks, norms and trust that facilitate community co-ordination and co-operation (Putnam, 1993, 1995). In particular, this research focuses on the cognitive aspects of social capital, in the form of pro-social norms (in this case, a sense of civic responsibility) and social trust, which may result from involvement in social networks. Involvement in the community, from little league teams and social clubs, is thought to produce shared norms of behavior between community members and a generalized trust in individuals and institutions (Putnam, 1993; Levi, 1996), and these may in turn facilitate civic action around societal issues (Ife, 1995; Heiman, 1997; Hayes, 1999; Wilkinson, 1996, 1997).

3.2.3 Environmental Action

Environmental action is categorized in this framework using a taxonomy developed out of existing literature and informed by the qualitative component of this research (Wakefield et al., 2001). The differences between environmental actions have been stressed in the psychological literature, and a number of categorizations of action types have been suggested (e.g., Dietz et al., 1998; Stern et al., 1999; Uyeki,

1999). In addition, several taxonomies of political action exist in the political science literature (e.g., Arnstein, 1969; Langton, 1978). There is considerable overlap between these classifications and the one presented here. This taxonomy provides additional richness, however, by drawing on elements of both literatures, and by providing a framework which accounts for the potentially intrusive nature of environmental pollution, which may encroach on daily life to such an extent that *some* response to the exposure (although not necessarily a positive one) is necessary.

In this taxonomy, four types/categories of active responses to environmental concern were identified. First, *reappraisal of lifestyle options* is typified by individual responses to air pollution which do not support social change, but are instead behavioural modifications made necessary by the intrusion of pollution into daily lives (e.g., increased cleaning, limiting outdoor activities - Elliott et al., 1999). This type of action, particularly relevant in situations where environmental conditions directly impact on residents, may mitigate individual impacts of exposure, but does nothing to reduce the exposure itself.

Second, *personal change* consists of activities which individuals undertake to try and personally improve environmental quality (e.g. recycling and consumer behavior). This is analogous to the "private-sector household behavior" construct put forward by Dietz et al. (1998). These actions may facilitate psychological empowerment, and may have direct - if small - environmental results (Stern, 2000), but do little to develop community capital or control (Rochon, 1998).

Third, *individual civic action* refers to individual activities which attempt to change societal processes (e.g. by complaining to government or industry about environmental problems, or donating to an environmental group). Again, this is similar to a construct suggested by Dietz et al., namely "environmental citizenship behaviors". These activities could lead to environmental change; they also can promote individual empowerment, both psychologically and through the development of skills. They do not, however, lead to new linkages within the community.

Finally, *collective civic action* (e.g., attendance at public meetings and protests - "committed activism" according to Stern et al., 1999) promotes individual empowerment, and facilitates community empowerment and the development of social capital by creating links between community members (Rissel, 1994; Hallman and Wandersman, 1992; Rochon, 1998). This form of action is focused on increasing the decision-making power and influence of local community organizations, and therefore has a fundamentally communal character. As noted in the conceptual framework (Figure 3.2), all types of action in this taxonomy are influenced by predisposition and capacity to take action, which are in turn influenced by characteristics of the exposure, individual, social network, and wider community.

3.3 RESEARCH DESIGN

In order to address the remaining research objectives, a quantitative survey was administered to a geographically stratified sample of residents in the City of

Hamilton, Ontario, Canada. Given the focus of this paper on community and environmental context, a brief description of the study community is warranted.

The City of Hamilton (Figure 3.1), is located about 100 km from Toronto, and has a population of approximately 500,000 residents (including the suburban municipalities). Employment in the city is concentrated in manufacturing (RMHW,1995), of which steel making is a principal component. The two primary steel manufacturers are the largest private-sector employers in the city (RMHW, 1997), and they support a wide variety of community initiatives, including softball leagues, park development, and local charitable organisations. Unfortunately, Hamilton has a long legacy of environmental problems, associated with this steelmaking and other industrial processes (Eyles and Peace, 1990). In particular, there is considerable academic and public concern about the impact of air pollution on health (Dockery et al., 1993; Burnett et al., 1998; Schwartz, 1994; Ontario Medical Association, 1998; David Suzuki Foundation, 1998; Mittelstaedt, 1999, Jerrett et al, 2001), and air pollution is a focus of ongoing research and civic action in the City of Hamilton (Hamilton Air Quality Initiative, 1997a).

There is considerable variation amongst the neighborhoods and communities within the City of Hamilton. The Niagara Escarpment runs through the middle of Hamilton, dividing "mountain" residents from the rest of the city by a drop of approximately 300 feet. This natural feature has greatly affected transportation routes and development in the area (Dear et al., 1987), and influences regional air

patterns (Clougherty, 1999). Industrial production is concentrated along the shores of Hamilton Harbour in the north of Hamilton (Figure 1). Environmental quality varies within the city: in particular, higher than average levels of certain air pollutants, including particulate matter and sulphur dioxide, are observed in north Hamilton (Hamilton Air Quality Initiative,1997b). Residential location in the region shows a distinct pattern with respect to socio-economic status: the western parts of Hamilton have higher priced housing and a larger proportion of higher income professionals; the "Hamilton Mountain" areas (above the escarpment) are newly developing areas with many residents employed in supervisory, technical, and sales positions; the northern and eastern parts of Hamilton (below the Niagara escarpment) are characterised by affordable housing and a relatively large proportion of warehouse laborers and service workers (RMHW, 1995).

Sample selection was limited to the *urban area* of Hamilton, identified as an amalgamation of contiguous zoning neighborhoods with populations of 1000 or more. The urban area, thus defined, was divided into five "communities". These communities, identified as Central, East, Mountain, North, and West (Figure 3.1), are subdivisions of the urban area based on city zoning neighborhood boundaries. These communities were chosen to approximate existing divisions within the City of Hamilton, on the basis of socio-demographic characteristics, physical barriers (e.g., the Niagara escarpment), and exposure to air pollution (as measured by estimated exposure to suspended particulate (TSP)).

The survey was administered to a random sample of households (n = 512). Respondents were randomly selected from a household database compiled by the City of Hamilton; approximately 100 households were selected from each community.

The survey was designed to collect information related to each component of the conceptual framework (each element is listed in Table 3.1). Data collection related to environmental perception focused around one particular type of environmental exposure: air pollution. Many investigations of environmental action have focused on generalized environmental concern and values as motivation to act. While this approach is both useful and reasonable, it fails to ground the research (and the individuals being studied) in a specific environmental context (Blake, 2001; Baldassare and Katz, 1992). In this study, it was considered important to try and bring this context explicitly into the research, by asking questions specifically related to environmental exposure and risk perception (questions are also asked about environmental concerns more generally). Air pollution was identified as the specific exposure for investigation because adverse air quality has received a great deal of attention in the community selected for research. Air pollution, then, is of primary importance in the study community, and colors residents' perceptions of environmental quality. One purpose of this study is to see if this sort of environmental context has an impact on general environmental action taking. It should also be noted that, while on the surface it would appear that certain environmental actions (e.g., recycling) have at best a minimal connection to air

quality concerns, a previous study emphasized the holistic, infrangible conceptions of environment held by residents in the study community, and potentially elsewhere (James and Eyles, 1999). In this context, all environmental actions may be related to each environmental problem, and all environmental problems may be addressed by each environmental action. This conception of holism in environmental action is borne out by the qualitative component of this research (Wakefield et al., 2001), in which respondents consistently mentioned a wide range of actions, including personal changes such as recycling, when asked what actions they had taken in relation to air pollution.

In order to collect data related to perceived air pollution exposure, then, the survey instrument included substantial elements of a questionnaire developed to measure perceptions, concerns, and impacts of exposure to air pollution (Elliott et al., 1999). Predisposition to take action is measured using four indicators: level of environmental concern; health concern; orientation to activism; and place attachment (Table 3.1). Specific measurements of environmental values and worldview were not included due to time constraints.

A number of additional items collected information on neighborhood interaction and support, and community participation (Table 3.1). These were drawn from both the initial survey and other sources, including the 1990 World Values Survey (Nevitte, 1996). Social trust was measured using two indicators: trust in neighbors and trust in government (both drawn from the World Values Survey). Levels of civic responsibility were measured using a series of questions from the

1990 World Values Survey which ask about socially irresponsible behavior (e.g. claiming illegitimate government benefits, cheating on taxes, reporting damage done to a parked car, buying stolen goods - Nevitte, 1996). Respondents were considered to exhibit high levels of civic responsibility if they responded that all of the above were never justified. Data were also collected on perceived empowerment/self-efficacy, as measured by a truncated version of the Rosenberg self-esteem scale which focuses on perceived competence (Ranzjin et al., 1998). Respondents were considered to have high self-efficacy if they scored above the cut-point on this standardized scale. Environmental action questions (Table 3.1) were mostly drawn from the Hamilton Harbour Watershed ECOWISE Survey (1995).

A series of socio-demographic measures were included at the end of the questionnaire as a check on the representativeness of the sample as well as for use in subsequent analysis (Table 3.1). Where possible, items were drawn from the Canadian census questionnaire, and matched those used in the preliminary survey. Questions on health status and smoking behavior were taken from the Ontario Health Survey (1990) and the National Population Health Survey (1996).

Telephone interviews, averaging 18 minutes, were conducted by the Institute of Social Research at York University between November, 1999, and February, 2000, using double random sampling in order to ensure representativeness by gender and age. The overall response rate was 70%, although rates varied somewhat by community (Central 73%, East 70%, North 66%, Mountain 65%, and West 77%). Overall, the sample is representative of both the study community(s) and Hamilton

as a whole. Both the City and the sample are predominantly Canadian-born and English-speaking; the sample has slightly higher proportions of individuals who have completed high school and own their own homes, and slightly lower percentages of people who have low incomes, than the population as a whole (Table 3.2). In addition, females are over- or under-represented in some communities, but there is good gender representativeness overall. These differences should be kept in mind when considering generalizability of results.

The majority of the survey data was entered directly into SPSS v10.1. Open-ended responses were entered verbatim into a word processing file along with respondents' identification numbers; these responses were subsequently coded and entered into the data set. Bivariate analysis was then performed on the data to identify both areal differences in characteristics of interest and to identify characteristics related to environmental action. The results of this analysis are discussed below.

3.4 RESULTS

In order to address the research objectives, this section begins by identifying intra-urban variations in individual, exposure, and social network characteristics. Next, variation in indicators of predisposition, capacity, and environmental action by community are described. The final paragraphs in this section describe the results of bivariate analysis which explored the factors influencing environmental action (defined here as taking two or more environmental actions in the previous year).

3.4.1 Characteristics of Individuals

In many respects (e.g. age, gender, employment status, country of birth, home language), the socio-demographic characteristics of respondents do not vary significantly by community. However, higher proportions of low income households are found in the North and Central communities, with lower percentages in the West (Table 3.3). Further, fewer residents in the North have completed high school than elsewhere. Significantly more respondents lived in single-person households in the Central community than in other communities, and significantly fewer were married, had children or owned their own homes, which is not surprising given the preponderance of multiple-family rental housing units in the community. What is surprising is the high percentage of home ownership and residence in single family dwellings in the North (Table 3.3), given the low levels of income reported there. This is partially explained by lower house prices in this neighborhood as a result of its proximity to heavy industry.

Most respondents reported that their health was good, very good, or excellent (Table 3.4). This varied moderately but not significantly between communities. The highest levels of reported fair or poor health were in the Central, North, and East, with 20% overall reporting that their health was fair or poor relative to others their own age. By comparison, just over 10% of the general Canadian population reported their health as fair or poor in the 1998 National Population Health Survey (Statistics Canada, 2001). Respondents reported a variety of respiratory illnesses (Table 3.4). Reported levels of asthma and emphysema were highest (but not by a statistically

significant margin) in the North, while hayfever was reported most often in the Mountain and West, and chronic cough in the East.

Smoking behavior showed strong differences between communities. The North had a significantly higher rate of daily smoking than other communities (Table 3.4); this rate is comparable with that found in the initial North Hamilton survey. In addition, the North had more than twice the amount of households reporting that two or more people smoked inside the house on a regular basis than other areas.

3.4.2 Perceptions of Exposure

Respondents were asked what they liked and disliked about their neighborhoods, in order to assess overall community perceptions, and to determine to what extent environmental issues figure into assessments of local quality of life. With only one exception, respondents across all five communities reported 'quiet' or 'access to amenities' as their top two likes about the local area (Table 3.5). North Hamilton respondents, however, reported liking their 'friendly neighbors' as well as access to amenities. Residents of North Hamilton were also more likely to mention that they did not like anything about their neighborhood (Table 3.5).

The most frequently reported dislike in all communities was 'don't know/nothing', although respondents in North and Central were less likely to report this. Crime and nuisance issues were the next most commonly mentioned dislikes overall, followed by traffic and parking problems (Table 3.6). In North Hamilton,

air pollution was the third most frequently mentioned dislike; in other areas, the percentage of respondents reporting air pollution as a dislike was negligible.

Differences in reported perceptions of air pollution by community were observed (Table 3.7). Residents in Central and North noticed air pollution in their neighborhood in the past summer more than residents in other areas. While two-thirds of individuals who reported *noticing* air pollution in their neighborhood reported being *bothered* by it more than half the time, this was not the case in the North, where less than half of respondents who reported noticing air pollution reported being bothered more than half the time. Overall, the majority of respondents reported that air pollution has not changed over the last 5 years (Table 3.7). Reports of worsening neighborhood air pollution came primarily from the least affected neighborhoods (e.g. the West), while in the North (the community most affected by air pollution) two thirds of respondents reported that air pollution had remained the same.

3.4.3 Social Network Characteristics

A number of items assessed respondents' ties to the community (Table 3.8). When asked, 90% of respondents considered their neighbors friendly; no statistically significant difference was observed between communities. There was also no significant difference between areas in terms of how often respondents talked to their neighbors. There were, however, significant differences between communities in relation to how often respondents helped their neighbors: Central and Mountain

respondents reported that they had *never* helped their neighbors a third more than other respondents (Table 3. 8).

The vast majority of respondents (over 90% in all communities) reported having adequate social support. Respondents in the West were most likely to have someone to confide in, while respondents in the North were least likely, but these differences were not significant (Table 3. 8). However, North and Central respondents were significantly less likely to report having someone who could help them, indicating somewhat decreased access to social support in these communities.

Most respondents (60% overall) were not involved in *any* local organizations, and levels of participation varied little between areas (Table 3. 8). Attendance at meetings of local council or school boards did vary significantly between communities, however, with respondents in the West reporting greatest attendance and the Mountain and North residents the least (Table 3. 8).

3.4.4 Predisposition and Capacity

Environmental concern is an important indicator of capacity. To assess environmental awareness and concern, respondents were asked what environmental issues were of concern to them. No prompts about potential issues were given, and up to three issues per respondent were recorded. At least one local environmental concern was mentioned by over three-quarters of respondents in all communities (Table 3. 9). Air pollution was the most commonly mentioned concern overall; no statistically significant differences in air pollution concern were observed between

areas (Table 3. 11, top). Other concerns mentioned were water pollution and the proposed Red Hill Creek Expressway (Table 3. 10). Respondents in communities with specific point source polluters (e.g. the landfill, incinerator, and Plastimet plastics fire site) were more likely to mention these issues as concerns than others.

Given the study's focus on air pollution, respondents who did not identify air pollution as an environmental issue were asked explicitly whether they were concerned about this issue: over 60% of these respondents felt air pollution was a concern (Table 3. 11, middle). When these sets of responses were combined, a total of 66% of respondents overall reported air pollution as a concern in Hamilton, and little variation in response between communities was seen (Table 3. 11, bottom). There was, however, significant variation between areas in terms of the expectation that air pollution might be harming respondents and their families. Over two thirds of respondents overall felt it was very or somewhat likely that air pollution was affecting a member of the household, with significantly more respondents in the East and North reporting concern about possible health effects (Table 3. 9).

The indicators of capacity used here do not show significant variation by neighborhood. About half the respondents felt that most people could be trusted; a larger proportion of respondents (71% overall) felt they could trust the government to do what is right all or most of the time. In general, most respondents had high civic responsibility index scores, and high scores on the perceived self-efficacy scale - there were no significant differences by community in either.

3.4.5 Environmental Action

A wide range of environmental actions were reported, with no significant differences in reporting by community. The vast majority of households in the survey reported recycling; about half reported refusing to buy a product for environmental reasons; and approximately 20% reported having donated to environmental organizations (Table 3. 12). Few respondents reported contacting someone (a politician, industry representative, etc.), attending public meetings, or participating in a protest about a local environmental issue (16, 11, and 6%, respectively - Table 3. 12). Overall, 46% of respondents had conducted 2 or more environmental actions in the last year.

3.4.6 Links between Determinants and Environmental Actions

A number of socio-demographic factors were related to having taken two or more environmental actions in the previous year. Female respondents were significantly more likely to take action, as were respondents who were born in Canada and spoke English in the home (Table 3. 13). In addition, respondents who reported having good health were more likely to take environmental action. Respondents with at least high school educations and relatively high incomes were also more likely to report having taken environmental action, as were individuals who owned their own homes (Table 3. 13).

Two factors related to environmental perception were also related to taking action. Respondents who mentioned an "environmental" dislike about their

neighborhood (i.e. air and other pollution) or who noticed air pollution in their neighborhood were more likely to report having taken two or more environmental actions in the previous year (Table 3. 13).

Several social network characteristics were significantly related to taking two or more environmental actions. Local city council or school board meeting attendance and local group membership were both related to increased environmental action (Table 3. 13). In addition, respondents who reported that their neighbors were friendly, and who talked to and helped their neighbors, were more likely to take action.

A number of indicators related to both predisposition and capacity emerged as significant predictors of environmental action. Being concerned about air pollution, and being concerned about environmental issues more generally (i.e. mentioning one or more environmental concerns when prompted), were both related to environmental action-taking (Table 3. 13). In addition, reporting that air pollution was likely to affect a member of the household was significantly related to taking action. With respect to capacity, having a high score on the self-efficacy scale (i.e. having greater perceived self-efficacy) was significantly related to environmental action, as was having a high score on the civic responsibility index (i.e. having a high degree of civic responsibility). Further, respondents who reported that they felt that the government could be trusted to do what was right all or most of the time were more likely to report having taken environmental actions (Table 3. 13). It should be noted that, while many of the potential predictors of environmental action were found

to vary by community, community of residence was not a significant predictor of environmental action.

3.5 DISCUSSION AND CONCLUSION

The results of this research indicate that there is considerable intra-urban variation within Hamilton. That is, the five communities within Hamilton identified in this research differ according to a number of characteristics, in many cases significantly. The distribution of respondents with certain socio-demographic characteristics (e.g. education, income, housing type and tenure, family status) varied considerably by community. In addition, air pollution perceptions varied by community, with the North and Central areas reporting greater levels of exposure. This is not surprising given the objectively higher levels of air pollution in this area (Hamilton Air Quality Initiative, 1997b).

Despite these underlying differences in community characteristics, however, little variation was observed between communities in terms of social network characteristics, measures of predisposition and capacity, or environmental action. Respondents in all areas seem to have supportive social networks, even if formal community involvement (e.g., through community groups) is not widespread. Respondents in all communities also seem to have similar levels of concern about environmental issues, although the issues of greatest importance may vary by community. Finally, levels of group civic action observed in all communities are quite low, while levels of personal change (typified by recycling) are extremely high.

Observed levels of different types of action support the taxonomy of environmental action set out in the conceptual framework, and bear out results from the qualitative study (Wakefield et al., 2001), but do not provide evidence of intra-urban differences in environmental action.

A number of factors were found to influence environmental action at the individual level, including individual characteristics (i.e. gender, country of birth, home language, education, income, home-ownership, and self-reported health status), exposure perception measures (i.e. mentioning a neighborhood environmental dislike, and noticing air pollution in neighborhood), social network characteristics (i.e. meeting attendance, local group membership, and friendships and communication with and aid of neighbors), predisposition (e.g. air pollution concern, broader environmental concern, and health concern), and capacity (e.g. self-efficacy, civic responsibility, and trust in government). Although not all of the characteristics specified in the conceptual framework were found to have an effect on environmental action, the bivariate analysis indicates that each component of the conceptual framework for which measures were collected bore some relationship to environmental action. This provides support for the conceptual and practical validity of the hypothesized framework.

Community of residence (the only measure of community level characteristics) was *not* a significant predictor of environmental action. It is interesting that, despite the significant differences between areas with respect to many of the individual-level predictors of environmental action (e.g. income,

education, air pollution exposure, city council meeting attendance), there is no evidence of differences in environmental action at the community level. It is also interesting that these same socio-demographic differences do not lead to differing social network characteristics between communities. This is surprising given the fairly significant differences observed between communities, and the influence these characteristics are thought to have on both the development of social networks (Putnam, 1995) and environmental action (Tranter, 1996) in the literature. This could indicate that socio-demographic characteristics, at least at an aggregate scale, have little influence on the formation of social networks or the taking of environmental action.

It is possible that another, unmeasured factor may be operating to "smooth out" compositional differences in action between areas (i.e. differences which are based on the aggregation of certain types of individuals in certain communities, rather than on the characteristics of the communities themselves - Duncan, 1998). This challenges traditional views which emphasize the autonomous and individual nature of environmental decision-making, and opens the door for explanations of environmental action which take into account local (rather than simply individual) differences. For example, there is some evidence in the literature that community homogeneity is an important facilitator of community attachment and the creation of social networks (Talen, 1999). In this case, the aggregation of certain types of people in certain places could lead to the development of community networks (which may in turn facilitate environmental action), regardless of whether or not the people in

those communities are (for example) well-educated (although the form a social network takes may vary by social class - Muntaner, Lynch, and Oates, 1999).

Alternatively, the lack of observed differences between areas in relation to environmental action may be due to the fact that the communities which are most exposed to pollution are not those which have the highest proportions of residents with characteristics which are thought to facilitate action (e.g. high income and education - Walsh et al., 1993). For example, residents in low-income areas with high levels of pollution may be predisposed to take action, while residents in more affluent areas may be less affected but more capable of action because of their characteristics; this may serve to moderate the observed differences in action among communities. In any case, these are issues which are worthy of further research.

Three additional avenues for research in this area can be identified. First, the impact of ecological factors on the development of social ties and on encouraging environmental action will need to be assessed in a more systematic way. So far in this research, area-level characteristics have been measured by aggregating the responses of individual respondents, and by incorporating "community of residence" as an explanatory variable. The inclusion of other potentially relevant variables at the neighborhood/community level (for example, the number of parks and recreational facilities in each community, which may facilitate social interaction) would add to the richness of the analysis. Second, a more complex analysis of the determinants of action, using logistic regression modeling, will help tease out the relative importance of the various factors identified in this preliminary analysis.

Finally, our understanding of environmental action over time, and in the context of current social and cultural change, would be enhanced by longitudinal studies in this area. In many jurisdictions, there has been a recent devolution of responsibility to local levels of government and to the voluntary sector (e.g. welfare, health care, environmental planning). Under this new regime, neighborhood action may become central to the protection of local environments and communities (Greenberg and Schneider, 1997). An increased understanding of what motivates (or hinders) local action is a first step in the increasingly necessary process of community mobilization.

3.6 ACKNOWLEDGMENTS

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3.7 REFERENCES

Altman, I. & Low S.M., Eds. (1992) Place Attachment. Plenum Press, New York.

Arnstein, S. (1969) A ladder of citizen participation. Journal of the American Planning Association, 35, 216-224.

Baldassare, M., & Katz, C. (1992)The personal threat of environmental problems as a predictor of environmental practices. Environment and Behavior, 24, 602-616.

Baxter, J., Eyles, J.D., & Elliott, S. J. (1999a) 'Something happened': the relevance of the 'risk society' for describing the siting process for a landfill Geografiska Annaler, 81, 91-109.

Baxter, J., Eyles, J.D., & Elliott, S.J., (1999b) From siting principles to siting practices: a case study of discord among trust, equity and community participation. Journal of Environmental Planning and Management, 42, 501-525.

Berger, Ida. (1997) The demographics of recycling and the structure of environmental behavior. Environment and Behavior, 29, 515-531.

Blake, D.E. (2001) Contextual effects of environmental attitudes and behavior. Environment and Behavior, 33, 708-725

Bowen, W.M., Salling, M.J., Haynes, K.E., & Cyran, E.J. (1995) Towards environmental justice: spatial equity in Cleveland and Ohio. Annals of the American Association of Geographers, 85, 641-663.

Brooks, S.M., Gochfeld, M., Herztein, J., Jackson, R.J., & Schenker, M.B., eds. (1995) Environmental Medicine. St.Louis, Mosby.

Brown, P., & Ferguson, F.I.T. (1995) 'Making a big stink': women's work, women's relationships, and toxic waste activism. Gender and Society, 9, 145-172.

Bullen, N., Moon, G., Jones, K. (1996) Defining localities for health planning: a GIS approach. Social Science and Medicine, 42, 801-816.

Burnett, R.T., Cakmak, S. & Brook, J.R. (1998) The effects of urban ambient air pollution mix on daily mortality rates in 11 Canadian cities. Canadian Journal of Public Health, 89, 152 - 156.

Cannan, C. (2000) The environmental crisis, greens and community development. Community Development Journal, 35, 365-376.

Carr-Hill, Roy and Rice, Nigel (1995) Is enumeration district level an improvement on ward level analysis in studies of deprivation and health? Journal of Epidemiology and Community Health, 49 (suppl), S28-S29.

Cattell, Vicky (2001) Poor people, poor places, and poor health: the mediating role of social networks and social capital. Social Science and Medicine, 52, 1501-1516.

Chavis, D.M., & Wandersman, A. (1990) Sense of Community in the Urban Environment: A Catalyst for Participation and Community Development. American Journal of Community Psychology, 18, 55-81.

Chow, J. (1998) Differentiating urban neighbourhoods: a multi-variate structural model analysis. Social Work Research, 22, 131-142.

Clougherty, J.E. (1999) Diurnal Patterns in Air Pollution and Respiratory Disposition. Master's thesis, McMaster University School of Geography and Geology, Hamilton, ON.

Corraliza, J.E., & Berenguer, J. (2000) Environmental values, beliefs, and actions: a situational approach. Environment and Behavior, 32, 832-848.

Cutter, S.L. (1994) Environmental Risks and Hazards New Jersey, PrenticeHall.

Cutter, S.L., Holm, D. and Clark, L. (1996) The role of geographic scale in monitoring environmental justice. Risk Analysis, 16, 517-526.

Darley, S. (1994) But the working class don't care about the environment...do they? Social Alternatives, 13, 37-41

David Suzuki Foundation (1998) Taking Our Breath Away: the Health Effects of Air Pollution and Climate Change. Climate of Change Series, Vancouver, Canada.

Dear, M.J., Drake J.J., & Reeds, L.G., eds. (1987) Steel City: Hamilton and Region Toronto, University of Toronto Press.

Dietz, T., Stern, P.C., & Guagnano, G.A. (1998) Social structural and social psychological bases of environmental concern Environment and Behavior, 30, 450-471.

Dockery, D.W., Pope, A.C. III, Xu, X., et al. (1993) An association between air pollution and mortality in six U.S. cities. New England Journal of Medicine, 329, 1753 - 1759.

Duncan, C. (1998) Context, composition, and heterogeneity: using multi-level modelling in health research Social Science and Medicine, 46, 97-117.

Dunlap, R.E., Van Liere, K.D., Mertig, A.G., & Jones R.E. (2000) New trends in measuring environmental attitudes: measuring endorsement of the New

Ecological Paradigm: a revised NEP scale. Journal of Social Issues, 56, 425-442.

Edelstein, M.R. (1988) Contaminated Communities. Boulder CO, Westview Press.

Edelstein, M.R., & Wandersman, A. (1987) Community dynamics in coping with toxic contaminants. In I. Altman & A. Wandersman, eds, Neighbourhood and Community Environments. New York, Plenum Press.

Eyles, J.D. & Peace, W. (1990) Signs and symbols in Hamilton: an iconology of Steeltown. Geographiska Annaler, 72B, 73-88.

Elliott, S.J., Cole, D.C., Krueger, P., Voorberg, N., & Wakefield, S. (1999) The power of perception: health risk attributed to air pollution in an urban industrial neighbourhood Risk Analysis, 19, 615-628.

Elliott, S.J., Taylor, S.M. (1996) Worrying about waste: diagnosis and prescription. In D Munton, ed. Hazardous Waste Siting and Democratic Choice Washington, DC, Georgetown University Press. pp 290-318.

Elliott, S.J., Taylor, S.M., Walter, S., Steib, D., Frank, J., & Eyles, J.D. (1993) Modelling psychosocial effects of exposure to solid waste facilities. Social Science and Medicine, 37, 791-804.

Evans, G.W., Cohen, S. (1987) Environmental stress. In D. Stokols and I. Altman, eds. The Handbook of Environmental Psychology Vol 2. New York, Wiley and Sons. pp 571-610.

Eyles, J. (1985) Senses of Place. Warrington, Silverbook Press.

Finger, M. (1994) From knowledge to action? Exploring the relationships between environmental experiences, learning, and behavior. Journal of Social Issues, 50, 141-160.

Foley, M.W and Edwards, B. (1999) Is it time to disinvest in social capital? Journal of Public Policy, 19, 141 - 173.

Fransson, N., and Garling, T. (1999) Environmental concern: Conceptual definitions, measurement methods, and research findings. Journal of Environmental Psychology, 19, 369-382.

Freudenberg, N., & Steinsapir, C. (1991) Not in our backyards: the grassroots environmental movement. Society and Natural Resources, 4, 235-245.

Gardner G.T., and Stern, P.C. (1996) Environmental Problems and Human Behavior. Boston: Allyn and Bacon.

Gould, K.A. (1993) Pollution and perception: social visibility and local environmental mobilization. Qualitative Sociology, 16, 157-178.

Green, L.W., & Kreuter, M.W. (1991) Health Promotion Planning: An Educational and Environmental Approach. 2nd ed. Mountain View, CA, Mayfield Publishing.

Greenberg, M.R., & Schneider, D. (1997) Neighborhood quality, environmental hazards, personality traits, and resident actions. Risk Analysis, 17, 169-175.

Guagnano, G.A., Stern, P.C., & Dietz, T. (1995) Influences on attitude-behavior relationships: a natural experiment with curbside recycling. Environment and Behavior, 27, 699-718.

W.K., & Wandersman, A. (1992) Attribution of responsibility and individual and collective coping with environmental threats. Journal of Social Issues, 48, 101-118.

Hallman, W.K., & Wandersman, A. (1992) Attribution of responsibility and individual and collective coping with environmental threats. Journal of Social Issues, 48, 101-118.

Hamilton Air Quality Initiative (1997a) Summary Report. Regional Municipality of Hamilton-Wentworth, Hamilton, ON.

Hamilton Air Quality Initiative (1997b) Human Health Risk Assessment for Priority Air Pollutants. Regional Municipality of Hamilton-Wentworth, Hamilton, ON.

Harvey, D. (1996) Justice, Nature, and the Geography of Difference. Cambridge UK, Blackwell.

Hayes, M. (1999) 'Man, disease, and environmental associations': from medical geography to health inequalities. Progress in Human Geography, 23, 289-296.

Heiman, M.K. (1997) Community attempts at sustainable development through corporate accountability. Journal of Environmental Planning and Management, 40, 631-643.

Hertzman, C., Hayes, M., Singer, J., and Highland, J. (1987) Upper Ottawa landfill site health study. Environmental Health Perspectives, 75, 175-195.

Hummon, D.M. (1990) Commonplaces: Community Ideology and Identity in American Culture Albany NY, State University of New York Press.

Hummon, D.M. (1992) Community attachment: local sentiment and sense of place. In I. Altman & S.M. Low, eds. Place Attachment. New York, Plenum Press. pp 1-12

Ife, J. (1995) Community Development. Melbourne, Longman.

Israel, B.A., Checkoway, B., Shultz, A., & Zimmerman, M. (1994) Health education and community empowerment: conceptualising and measuring perceptions of individual, organizational, and community control. Health Education Quarterly, 21, 149-170.

Jerrett, M., Eyles, J., & Cole, D. (1998) Socio-economic and environmental co-variates of premature mortality in Ontario. Social Science and Medicine, 47, 33-49.

Jerrett, M., Kanaroglou, P., Eyles, J., Finkelstein, N., & Giovis, C. (2001) A GIS-environmental justice analysis of particulate air pollution in Hamilton, Canada. Environment and Planning A, 33, 1 - 19.

James, J. and Eyles, J.D. (1999) 'Perceiving and representing both health and the environment: an exploratory investigation', Qualitative Health Research, 9 (1).

Jones, R.E., & Dunlap, R.E. (1992) The social bases of environmental concern: have they changed over time? Rural Sociology, 57, 28-47.

Kaplan, S. (2000) Human Nature and Environmentally Responsible Behavior. Journal of Social Issues, 56, 491-508.

Kasperson, R.E., Renn, O., Slovic, P., Brown, H.S., Emel, J., Goble, R., Kasperson, J.X., Retick, S. (1988) The social amplification of risk: a conceptual framework" Risk Analysis, 8, 177-87.

Kearns, Ada, & Parkinson, M. (2001) The significance of neighbourhood Urban Studies, 38, 2103-2110.

Kelly, P.F. (1994) Towanda's triumph: social and cultural capital in the transition to adulthood in the urban ghetto. International Journal of Urban and Regional Research, 18, 88-111.

Kivell, P.T., Burton, B.J., and Dawson, B.R.P. (1990) Neighbourhoods for health service administration. Social Science and Medicine, 30, 701-711.

Kling, J. (1993) Complex society/complex cities: New social movements and the restructuring of urban space. In J. Kling, & M. Keith, eds. Mobilizing the Community: Local Politics in the Era of the Global City London, Sage. pp 28-51.

Koenig, D.J. (1975) Additional Research on Environmental Activism. Environment and Behavior, 7, 472-485.

Kousis, M. (1999) Sustaining local environmental mobilisations: Groups, actions and claims in Southern Europe. Environmental Politics, 8, 172-198.

Kufrin, K. (1995) Environmental attitudes and behavior: a missing link. Socijalna Ekologija, 5, 1-20.

Labonte, R. (1993) Community development and partnerships. Canadian Journal of Public Health, 84, 237-240.

Langton, S., ed. (1978) Citizen Participation in America Lexington MA, DC Health.

Lazarus, R.S., & Folkman, S. (1984) Stress, Appraisal, and Coping. New York, Springer.

Levi, M. (1996) Social and unsocial capital: A review essay of Robert Putnam's 'Making Democracy Work'. Politics and Society, 24, 45-55.

Lipshutz, R.D. (1996) Global Civil Society and Global Environmental Governance. Albany NY, State University of New York Press.

Lober, D.J. (1995) Why protest? Some public behavioural and attitudinal responses to siting a waste disposal facility. Policy Studies Journal, 23, 499-518.

Luginaah, I.N., Taylor, S.M., Elliott, S.J., & Eyles, J.D. (2000) A longitudinal study of the health impacts of a petroleum refinery. Social Science and Medicine, 50, 1155-1166.

MacIntyre, S., McIver, S., & Sooman, A. (1993) Area, class and health: should we be looking at places or people? Journal of Social Policy, 22, 213-234.

Martin, P. (1997) Saline politics: local participation and neoliberalism in Australian rural environments. Space and Polity, 1, 115-133.

Massey, D. (1994) Space, Place, and Gender. Cambridge UK, Polity Press.

McGee, T.K. (1999) Private responses and individual action: Community Responses to Chronic Environmental Lead Contamination. Environment and Behavior, 31, 66-83.

McGurty, E.M. (2000) Warren County, NC, and the emergence of the environmental justice movement: Unlikely coalitions and shared meanings in local collective action. Society and Natural Resources, 13, 373-387.

McPhee, E. (1996) Community environmental action: the Plumstead Common experience. Local Environment, 1, 183-196.

Mittelstaedt, Martin. 1999. Air quality rules too lax, poll finds. Globe and Mail, Tuesday April 20, A10.

Mohai, P. (1992) Men, women, and the environment: an examination of the gender gap in environmental concern and activism. Society and Natural Resources, 5, 1-19.

Muntaner, Carles, John Lynch, and Gary Oates. 1999. The Social Class Determinants of Income Inequality and Social Cohesion Part II: Presentation of an Alternative Model. *International Journal of Health Services* 29: 715-732.

Nevitte N. (1996) The Decline of Deference. Broadview Press, Peterborough ON.

Nevitte, N. and Kanji, M. (1995) Explaining environmental concern and action in Canada. Applied Behavioral Science Review,3, 85-102.

Ontario Medical Association (1998) Ground Level Ozone Position Paper. OMA, Toronto ON.

Perkins, D.D., Brown, B.B., & Taylor, R.B. (1996) The ecology of empowerment: predicting participation in community organizations. Journal of Social Issues, 52, 85-110.

Prato, G.B. (1993) Political decision making: environmentalism, ethics and popular participation in Italy. In K. Milton, ed. Environmentalism: the view from anthropology ASA Monographs, Vol 32, London, Routledge. pp 174-188.

Preston, V., Taylor, S.M., & Hodge, D.C. (1983) Adjustment to natural and technological hazards: a study of an urban community. Environment and Behavior, 15, 143-164.

Powell, D., & Leiss, W. (1997) Mad Cows and Mother's Milk. Montreal, McGill-Queen's University Press.

Putnam, R. (1995) Bowling alone: America's declining social capital. Journal of Democracy, 6, 65-78.

Putnam, R. (1993) Making Democracy Work: Civic Traditions in Modern Italy Princeton NJ, Princeton University Press.

Ranzjin, R., Keeves, J., Luszcz, M., & Feather, N.T. (1998) The role of perceived usefulness and competence in the self-esteem of early adults: confirmatory factor analyses of the Bachman Revision of the Rosenberg Self-Esteem Scale. Journal of Gerontology, 53B, 96-104.

Reading, R. and Openshaw, S. (1993) Do inaccuracies in small area deprivation analyses matter? Journal of Epidemiology and Community Health, 47, 238-241.

RMHW - Regional Municipality of Hamilton-Wentworth (1997) Greater Hamilton Factbook. Hamilton, ON, RMHW Economic Development Department.

RMHW - Regional Municipality of Hamilton-Wentworth (1995) *Commuter Study for Hamilton-Wentworth and Surrounding Areas.* Hamilton, ON: RMHW Planning and Development Department.

Rios, J.M. (2000) Environmental justice groups: Grass-roots movement or NGO networks? Some policy implications. Policy Studies Review, 17, 179-211.

Rissel, C. (1994) Empowerment: the holy grail of health promotion? Health Promotion International, 9, 39-47.

Rochon, T.R. (1998) Culture Moves: Ideas, Activism, and Changing Values Princeton NJ, Princeton University Press.

Rohe, W.M., & Basolo, V. (1997) Long-term effects of homeownership on the self-perceptions and social interaction of low-income persons. Environment and Behavior, 29, 793-819.

Seguin, C., Pelletier, L.C., & Hunsley, J. (1998) Toward a model of environmental activism. Environment and Behavior, 30, 628-652.

Schwartz, Joel (1994) Air pollution and daily mortality: a review and meta-analysis. Environmental Research 64: 36 - 52..

Slovic, P. (1987) Perception of Risk. Science, 236, 280-285.

Statistics Canada (2001) National Population Health Survey, Cycle 3 (1998-99). Public Use Microdata Files Documentation.

Stern, Paul C. (2000) Toward a coherent theory of environmentally significant behavior. Journal of Social Issues, 56, 407 - 424.

Stern, P.C., Dietz, T., Able, T., Guagnano, G.A.& Kalof, L. (1999) A value-belief-norm theory of support for social movements: the case of environmental concern. Human Ecology Review, 6, 81-97.

Talen, E. (1999) Sense of community and neighbourhood form: an assessment of the social doctrine of new urbanism. Urban Studies, 36, 1361-1379.

Tranter, B. (1996) The social bases of environmentalism in Australia. Australian and New Zealand Journal of Sociology, 32, 61-85.

Uyeki, Eugene S. (1999) Environmental beliefs, intended action, and behavior. American Sociological Association (ASA), Association Paper.

Uzzell, D., Pol, E., and Badenas, D. (2002) Place identification, social cohesion, and environmental sustainability. Environment and Behavior, 34, 26-53.

Vorkinn, M. and Riese, H. (2001) Environmental concern in a local context: the significance of place attachment. Environment and Behavior, 33, 249-263.

Wakefield, S., & Elliott, S.J. (2000) Environmental risk perception and well being: effects of the landfill siting process in two Southern Ontario communities. Social Science and Medicine, 50, 1139-1154.

Wakefield, S., Elliott, S., Cole, D., & Eyles, J. (2001) Environmental risk and (re)action: air quality, health, and civic involvement in an urban industrial neighbourhood. Health and Place, 7, 163-177.

Walsh, E., Warland, R., & Smith, D.C. (1993) Backyards, NIMBYs and incinerator sitings: implications for social movement theory. Social Problems, 40, 25-38.

Wildavsky, A. & Dake, K. (1990) Theories of risk perception: who fears what and why? Daedalus, 119, 41-60.

Wilkinson, R.G. (1996) Unhealthy Societies: The Afflictions of Inequality. London, Routledge.

Wilkinson, R.G. (1997) Health inequalities: relative or absolute material standards? British Medical Journal, 314, 591-595.

Zelezny, L.C., Chua, P-P., and Aldrich, C. (2000) Elaborating on gender differences in environmentalism. Journal of Social Issues, 56, 443 - 457.

TABLE 3.1:
Survey Constructs and Indicators

Issue/Exposure Characteristics	
sensibility	Noticed air pollution in neighborhood?
duration	How often noticed air pollution?
intensity	Air pollution changed in last 5 years? Air pollution bother you?
Individual Characteristics	
socio-demographic characteristics	age, gender, ethnicity, income, education, employment status, marital status, presence of children/seniors in household, housing type, housing tenure, self-reported health status, smoking
Social Network Characteristics	
social support	Someone to confide in? Someone to help you if you need it?
neighborhood interaction	Neighbors friendly? Talk to neighbors? Help neighbors?
community participation	Attended school board/city council meetings? How many local organisations belong to?
Wider Community Characteristics	
Intra-urban variation	"community"
Predisposition	
neighborhood attachment	Like/dislikes about neighborhood (up to 3 open-ended responses)
orientation towards activism	Would you ever participate in a protest? Sign a petition? Etc.
environmental concerns	Local environmental issues are of concern (3 open responses)
health concern	How likely that households' health affected by air pollution?
Capacity	
self-efficacy	truncated Rosenberg self-esteem scale (Ranzjin et al., 1998)
social trust	Trust the government? Trust other people?
civic responsibility	civic responsibility index (1990 World Values Survey)
Environmental Action	
reactive lifestyle change	subset of open-ended responses to "Has air pollution affected your daily life?"
personal change	Recycled? Refused to buy a product?
individual civic action	Complained to government/industry/media? Donated money?
co-operative civic action	Signed petition? Attended public meeting or protest?

TABLE 3.2:

Census and Sample Characteristics, by Area

Characteristic	Central		East		Mountain		North		West		Total Study Area - Sample	*Total Study Area - Census*	*Hamilton CMA**
	Sample	*Census*	Sample	*Census*	Sample	*Census*	Sample	*Census*	Sample	*Census*			
% female	52	*51*	60	*51*	54	*52*	42	*51*	50	*52*	52	*51*	***51***
% Canadian born	79	*70*	76	*71*	72	*76*	77	*78*	75	*75*	76	*74*	***76***
% English in home	87	*81*	90	*81*	93	*87*	93	*86*	89	*90*	90	*85*	***89***
% education <high school	32	*40*	26	*39*	32	*37*	37	*51*	18	*26*	28	*37*	***34***
% income <$30 000	31	*57*	16	*32*	23	*35*	44	*51*	13	*26*	24	*39*	***33***
% own home	47	*33*	74	*66*	71	*67*	77	*60*	79	*72*	70	*60*	***65***

*CMA = Census Metropolitan Area

Source: Statistics Canada, 1996 Census

TABLE 3.3:
Individual Characteristics Which Vary Significantly by Area

Variable	# Reporting (% Reporting)					
	Central	East	Mountain	North	West	Total
Household income less than $30 000/year*** (n = 393)	38 (52)	23 (29)	27 (32)	29 (43)	15 (17)	132 (34)
Less than high school education* (n = 506)	30 (32)	26 (26)	36 (32)	31 (38)	22 (18)	145 (29)
Own home*** (n = 510)	44 (47)	75 (74)	80 (71)	64 (77)	96 (80)	359 (71)
Live in single family dwelling*** (n = 512)	31 (33)	56 (55)	73 (65)	63 (77)	85 (71)	306 (61)
Married* (n = 510)	41 (44)	63 (62)	63 (57)	41 (50)	82 (67)	290 (57)
Child (<18 years old) living in household* (n = 512)	16 (17)	29 (29)	30 (27)	31 (37)	43 (35)	149 (29)
Single person household** (n = 512)	44 (47)	19 (19)	29 (26)	21 (25)	19 (16)	133 (26)
Household of 4 or more persons** (n = 512)	11 (12)	25 (25)	26 (23)	24 (29)	39 (32)	123 (24)

* $p < .05$ ** $p < .01$ ***$p < .001$

TABLE 3.4:
Health Status and Smoking Behaviour

Variable	# Reporting (% Reporting)					
	Central	East	Mountain	North	West	Total
Self-reported health status						
• excellent or very good	52 (56)	46 (46)	65 (58)	35 (42)	71 (58)	269 (53)
• good	15 (16)	32 (32)	29 (26)	28 (34)	34 (28)	138 (27)
• fair or poor	26 (28)	23 (23)	18 (16)	20 (24)	17 (14)	104 (20)
Presence of asthma in household	15 (16)	12 (12)	17 (16)	14 (18)	14 (13)	71 (15)
Person with hayfever/other allergies in household*	28 (30)	43 (43)	55 (50)	32 (39)	61 (50)	219 (43)
Person with emphysema/bronchitis in household	8 (9)	7 (7)	11 (10)	10 (12)	7 (6)	43 (8)
Person with persistent cough in household	19 (21)	22 (22)	23 (21)	14 (17)	15 (12)	93 (18)
Presently smoke tobacco daily**	18 (19)	19 (19)	20 (18)	34 (41)	24 (20)	115 (23)
2 or more people smoke inside the house***	9 (10)	9 (9)	7 (6)	21 (25)	9 (7)	55 (11)

* $p < .05$ ** $p < .01$ ***$p < .001$

TABLE 3.5:
Neighbourhood "Likes"

Like	# Reporting (% Reporting)					
	Central (n = 94)	East (n = 101)	Mountain (n = 111)	North (n = 83)	West (n = 122)	*Total (n = 511)*
Quiet	15 (16)	33 (33)	27 (24)	16 (19)	45 (37)	*136 (27)*
Access to amenities	29 (31)	24 (24)	32 (29)	25 (30)	25 (21)	*135 (26)*
Friendly neighbours	13 (14)	11 (11)	17 (15)	17 (20)	17 (14)	*75 (15)*
Green space	5 (5)	10 (10)	9 (8)	2 (2)	11 (9)	*37 (7)*
Other*	24 (26)	20 (20)	21 (19)	12 (15)	21 (17)	*98 (19)*
Don't know/nothing	8 (9)	3 (3)	6 (5)	11 (13)	3 (3)	*31 (6)*

* "other" category includes likes such as housing quality, familiarity with neighbourhood, and privacy; none exceed 3% of mentions
Note: percentages may not equal 100% due to rounding

TABLE 3.6:
Neighbourhood Dislikes

Dislike	# Reporting (% Reporting)					
	Central (n = 94)	East (n = 101)	Mountain (n = 112)	North (n = 83)	West (n = 122)	*Total (n = 512)*
Don't know/nothing	30 (33)	46 (46)	57 (51)	26 (31)	58 (48)	*217 (43)*
Crime/nuisance	21 (23)	9 (9)	19 (17)	14 (17)	12 (10)	*75 (15)*
Traffic/parking	14 (15)	18 (18)	16 (14)	10 (12)	16 (13)	*74 (15)*
Lack of amenities	4 (4)	9 (9)	2 (2)	2 (2)	15 (12)	*32 (6)*
Problems with neighbours	6 (7)	2 (2)	5 (5)	6 (7)	3 (3)	*23 (5)*
Air Pollution	4 (4)	4 (4)	-	11 (13)	3 (3)	*22 (4)*
Other	12 (13)	13 (13)	13 (12)	14 (17)	14 (11)	*66 (13)*

Note: percentages may not equal 100% due to rounding

TABLE 3.7:
Exposure Reporting

Variable	# Reporting (% Reporting)					
	Central	East	Mountain	North	West	Total
Noticed air pollution in the previous summer*** (n = 512)	69 (73)	57 (56)	59 (53)	61 (74)	55 (45)	301 (59)
Noticed air pollution every day* (n = 301 [1])	12 (19)	11 (21)	4 (7)	14 (25)	4 (8)	45 (16)
Air pollution bothers you more than half the time* (n = 275 [1])	31 (70)	34 (68)	41 (77)	26 (46)	32 (67)	174 (65)
Air pollution perceptions over the past 5 years** (n = 276 [1])	15 (24)	20 (38)	20 (38)	8 (14)	24 (48)	87 (32)
• air pollution has become worse	14 (23)	2 (4)	5 (9)	11 (19)	3 (6)	35 (13)
• air pollution has improved	33 (53)	31 (59)	28 (53)	39 (67)	23 (46)	154 (56)
• air pollution has stayed the same						

* $p < .05$ ** $p < .01$ ***$p < .001$
1. Subset of respondents (only those who mentioned having noticed air pollution in their neighbourhood)

TABLE 3.8:
Social Network Characteristics

Variable	# Reporting (% Reporting)					
	Central	East	Mountain	North	West	Total
Neighbours friendly (n=512)	80 (85)	90 (89)	104 (93)	77 (93)	112 (92)	463 (90)
Talk to neighbours once a week or more (n=512)	66 (70)	82 (81)	81 (72)	64 (77)	90 (74)	383 (75)
Never help neighbours/don't know neighbours* (n=503)	31 (33)	14 (14)	29 (30)	17 (20)	16 (13)	107 (21)
Have someone to confide in (n=509)	87 (93)	95 (94)	105 (94)	75 (90)	115 (97)	477 (94)
Have someone to help you if you need it** (n=510)	86 (92)	100 (99)	111 (99)	76 (92)	119 (99)	492 (96)
Lived in neighbourhood for 11 years or more (n=511)	47 (51)	64 (63)	58 (52)	42 (51)	70 (57)	281 (55)
Involved in one or more local organizations (n=512)	39 (42)	41 (41)	40 (36)	30 (36)	56 (46)	206 (40)
Attended meetings of the city council/school board* (n=512)	32 (34)	34 (34)	28 (25)	25 (30)	54 (44)	173 (34)

* $p < .05$ ** $p < .01$ ***$p < .001$

TABLE 3.9:
Indicators of Predisposition and Capacity

Variable	# Reporting (% Reporting)					
	Central	East	Mountain	North	West	Total
Mentioned at least one environmental concern (n=511)	76 (81)	84 (83)	93 (83)	63 (76)	96 (79)	412 (81)
Thinking household member likely to be affected by air pollution (n=476)*	60 (68)	76 (82)	72 (69)	58 (77)	73 (64)	339 (71)
Feel most people can be trusted (n = 479)	47 (53)	40 (42)	52 (50)	33 (43)	64 (56)	236 (49)
Trust the government to do what is right all or most of the time (n=510)	70 (75)	69 (68)	79 (71)	53 (64)	89 (72)	360 (71)
High civic responsibility score (n=502)	53 (58)	67 (68)	74 (67)	48 (59)	84 (70)	326 (65)
High self-esteem score (n=473)	81 (86)	92 (91)	105 (94)	74 (89)	112 (92)	464 (91)

* $p < .05$ ** $p < .01$ ***$p < .001$
1. Subset of respondents (those who mentioned having noticed air pollution in their neighbourhood only)

TABLE 3.10:
Environmental Concerns

Environmental Concern (1st Mention)	# Reporting (% Reporting)					
	Central (n = 94)	East (n = 101)	Mountain (n = 112)	North (n = 83)	West (n = 122)	*Total (n = 512)*
Air pollution	24 (26)	24 (24)	29 (26)	21 (25)	21 (17)	*119 (23)*
Water pollution	18 (19)	12 (12)	26 (23)	22 (27)	32 (26)	*110 (22)*
Don't know/nothing	18 (19)	17 (17)	19 (17)	20 (24)	25 (21)	*99 (19)*
Proposed expressway through Red Hill Creek	6 (6)	14 (14)	9 (8)	8 (10)	10 (8)	*47 (9)*
Local landfill/incinerator	2 (2)	21 (21)	3 (3)	-	3 (3)	*29 (6)*
Disappearing green space	3 (3)	3 (3)	3 (3)	1 (1)	12 (10)	*22 (4)*
Garbage/recycling	7 (7)	4 (4)	6 (5)	2 (2)	3 (3)	*22 (4)*
Plastimet	5 (5)	-	3 (3)	3 (4)	3 (3)	*14 (3)*
Other	11 (12)	6 (6)	14 (13)	6 (7)	12 (10)	*49 (10)*

TABLE 3.11:
Air Pollution Concerns

Air Pollution Concern: Unsolicited		
Area	Mentioned	Not Mentioned
Central (n=94)	36 (38%)	58(62%)
East (n=101)	34 (34%)	67 (66%)
Mountain (n=112)	44 (39%)	68 (60%)
North (n=83)	34 (41%)	49 (59%)
West (n=122)	43 (35%)	79 (65%)
Total (n=512)	*191 (37%)*	*321 (63%)*
Air Pollution Concern: Solicited		
Area	Concerned	Not Concerned
Central (n=50)	28 (65%)	15 (30%)
East (n=62)	43 (77%)	13 (21%)
Mountain (n=48)	24 (55%)	20 (42%)
North (n=41)	21 (64%)	12 (25%)
West (n=63)	33 (58%)	24 (38%)
Total (n=264)	*149 (64%)*	*84 (32%)*
All Air Pollution Concern		
Area	Mentioned Concern	No Concern
Central (n=94)	64 (68%)	30 (32%)
East (n=101)	77 (76%)	24 (24%)
Mountain (n=112)	68 (61%)	44 (39%)
North (n=83)	55 (66%)	28 (34%)
West (n=122)	76 (62%)	46 (38%)
Total (n=512)	*340 (66%)*	*172 (33%)*

TABLE 3.12:
Environmental Action

Variable (n = 512 for all)	# Reporting (% Reporting)					
	Central	East	Mountain	North	West	Total
Regularly sort materials for recycling	83 (88)	95 (95)	103 (92)	76 (92)	109 (89)	466 (91)
Refused to buy a product for environmental reasons	38 (40)	42 (42)	49 (44)	37 (45)	57 (47)	223 (44)
Donated money to a local environmental group	17 (18)	23 (23)	15 (13)	17 (21)	30 (25)	102 (20)
Contacted government or industry about local environmental issue	16 (17)	20 (20)	13 (12)	13 (16)	19 (16)	81 (16)
Attended a public meeting about a local environmental issue	13 (14)	13 (13)	8 (7)	9 (11)	16 (13)	59 (12)
Attended public protest about local environmental issue	8 (9)	8 (8)	3 (3)	6 (7)	4 (3)	29 (6)
Have taken 2 or more of above actions	48 (51)	55 (55)	59 (53)	44 (53)	71 (58)	277 (54)

* $p < .05$ ** $p < .01$ ***$p < .001$

TABLE 3.13:
Bi-variate determinants of environmental action (i.e. having taken 2 or more environmental actions in the previous year)

Factor	**X^2 Significance**
Individual Characteristics	
Being female	p = .007
Being born in Canada	p = .009
Speaking English at home	p = .000
Considering health to be very good or excellent	p = .000
Having completed high school	p = .001
Owning home	p = . 005
Not having a low income (>$30 000)	p = .023
Exposure Characteristics	
Mentioning an environmental dislike about neighborhood	p = .000
Noticing air pollution in neighborhood	p = .000
Social Network Characteristics	
Attending meetings of city council/school board	p = .000
Belonging to local groups	p = .024
Helping neighbors	p = .000
Talking to neighbors	p = .009
Finding neighbors friendly	p = .01
Indicators of Predisposition	
Having environmental concerns	p = .000
Thinking household member likely to be affected by air pollution	p = .000
Mentioning unsolicited air pollution concern	p = .05
Indicators of Capacity	
Having a high self-esteem score	p = .001
Having a high civic responsibility index score	p = .001
Thinking government can be trusted to do what is right	p = .021

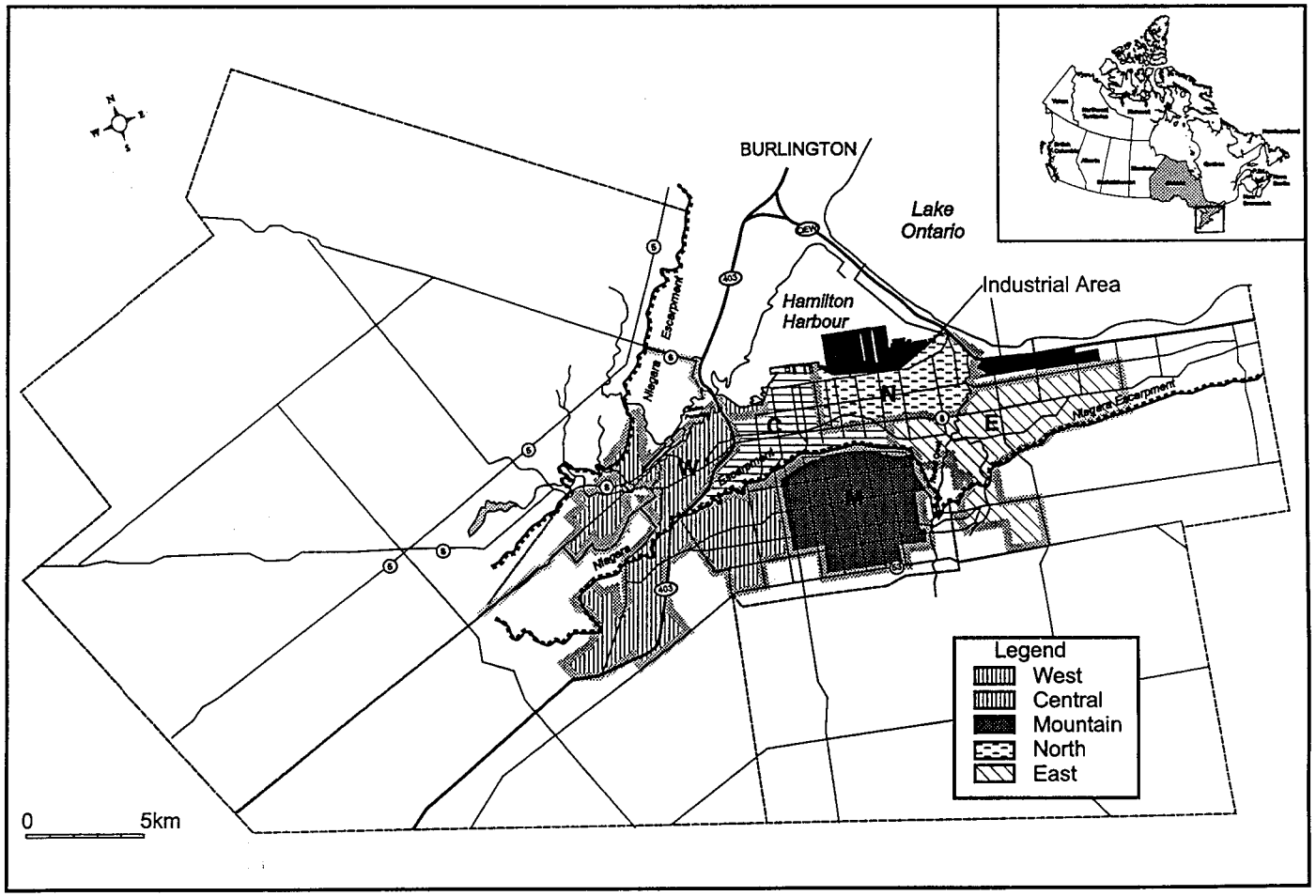

FIGURE 3.1:
Location of the Study Areas Within the City of Hamilton

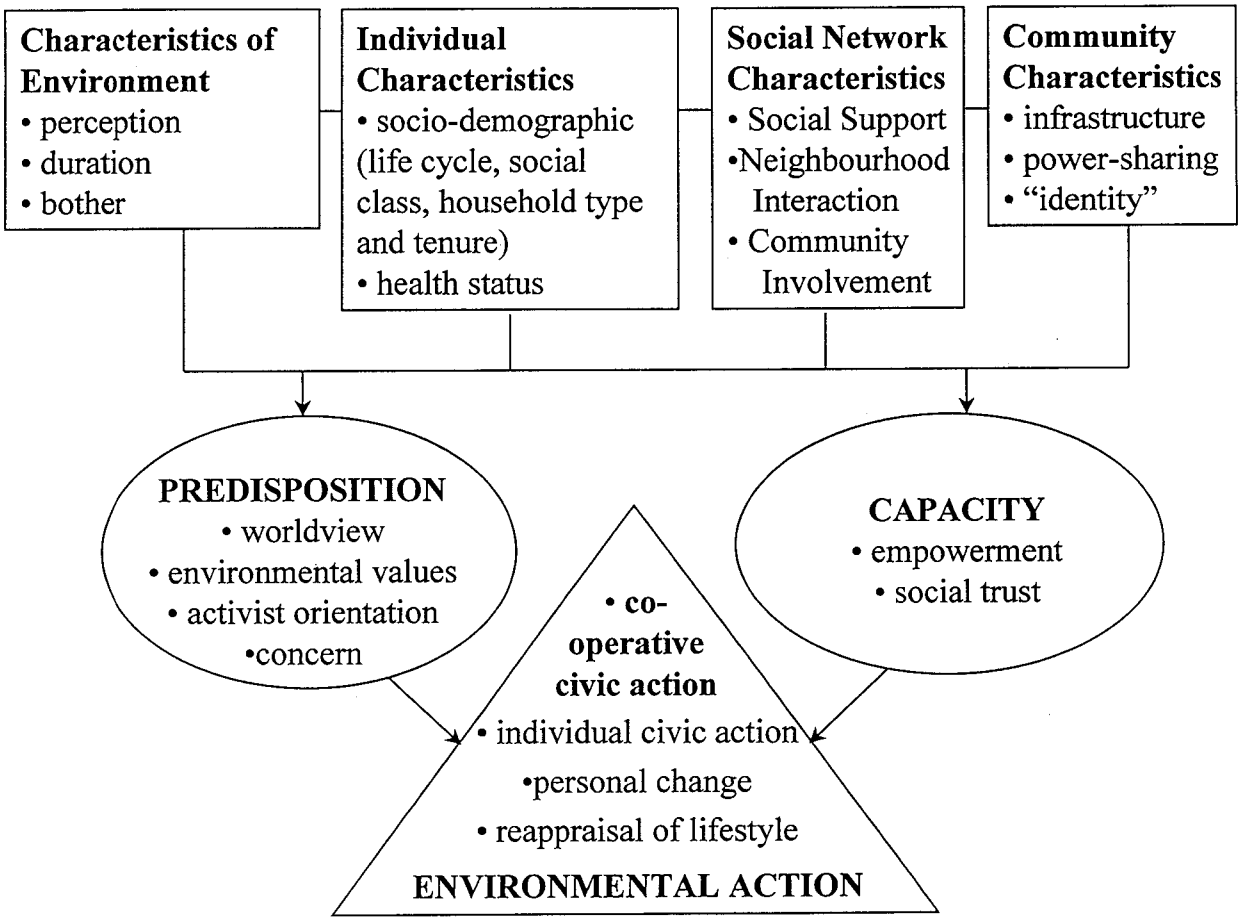

FIGURE 3.2:
Conceptual Framework

CHAPTER 4

THE DETERMINANTS OF ENVIRONMENTAL ACTION IN AN INDUSTRIAL CITY

Sarah E.L. Wakefield[1,*], Susan J. Elliott[1,2], Donald C. Cole[2,3] and John D. Eyles[1,2]

ABSTRACT

This paper presents the results of a study of individual and community action in response to perceived environmental risks in Hamilton, Ontario, Canada. While there is a considerable literature around the determinants of environmental action, the nature and intensity of observed relationships vary between studies, distinctions between types of environmental action are generally not recognized, and the role of social context in the development of environmental action has rarely been addressed. This paper furthers research in this area by identifying the determinants of environmental action across a range of different action types, and by examining the role of place/context in the development of environmental action. A quantitative survey, which investigated environmental perception and concern, individual and social network characteristics, and environmental action, was administered to a random sample of households in Hamilton (n=512, stratified by area of residence). Predictors of a variety of types of environmental action were identified through logistic regression analysis. Results suggest that substantial differences exist between types of environmental actions, and that factors related to perceptions of environmental exposure and respondents' social networks/social capital generally played a larger, more consistent role in environmental action-taking than socio-demographic factors. These results highlight the importance of contextual factors, both environmental and social, to civic action.

Keywords: environmental action, social capital, risk perception and concern

* corresponding author: Tel: 1-905-525-9140 ext 24081; Fax: 1-905-546-0463; Email: swakefie@mcmaster.ca

1 School of Geography and Geology, McMaster University, 1280 Main St. W., Hamilton, ON L8S 1K4

2 Institute of Environment and Health, McMaster University, 1280 Main St. W., Hamilton, ON L8S 1K4

3 Department of Public Health Sciences, University of Toronto, 12 Queen's Park Cresent W., McMurrich Building, Toronto, ON M5S1A8

4.1 INTRODUCTION

Civic action around local issues is of increasing importance to progressive social change, given the retrenchment of environmental protection and public health services, and the concomitant devolution of public service provision to the local level, in many jurisdictions around the globe (Chavis and Wandersman, 1990; Hay, 1998; Ackelsberg, 2001). In lieu of government control, local activism has become a driving force in local environmental and health protection, as residents band together to gain a greater say in decisions that affect their health and homes (Northridge and Shepard, 1995, 730). In this context, understanding the factors which influence action-taking around environmental issues becomes central to the development of environmental (and other) policy.

Environmental action is defined in this study (as in Stern, 2000) as behavior undertaken to benefit the environment. A considerable body of theory has developed in the social sciences around the determinants of action, and specifically around environmental action (e.g., Nevitte and Kanji, 1995; Finger, 1994). However, the nature and intensity of relationships among the variables identified in this research vary greatly from study to study (Tranter, 1996; Deitz et al, 1998), such that no clear picture of the determinants of environmental action can be drawn. This muddied picture may result from different types of environmental action measured in each study (for example, recycling versus public protest). In addition, while research in this area has increasingly recognised the importance of context in the development of environmental concern and action (Vorkinn and Riese, 2001; Blake, 2001),

"context" has been measured in a fairly limited way. In particular, the role of social capital (Putnam, 1993, 1995; Bourdieu, 1986) in the development of environmental action has rarely been addressed.

This paper addresses the shortcomings of existing research by investigating the determinants of several different types of environmental action concurrently, and by explicitly investigating the role of place and social capital in shaping environmental action. The objectives of this paper are therefore twofold: first, to identify the determinants of environmental action, across a range of different action types; and second, to examine the role of social context in the development of environmental action, especially with respect to social capital.

4.2 THE DETERMINANTS OF ENVIRONMENTAL ACTION: A CONCEPTUAL FRAMEWORK

Numerous investigations of the determinants of environmental action can be found in the literature (e.g., Greenberg and Schneider, 1997; Nevitte and Kanji, 1995). However, the determinants of environmental action remain unclear. Indeed, much of the research in this area has shown that factors which might be expected to influence environmental action-taking may not do so: for example, experiences with, knowledge of, and concern about environmental issues have been found *not* to be related to action (Blake, 2001; Obregon-Salido and Corral Verdugo, 1997; Finger, 1994; Gould, 1993; Cary, 1993). While fairly consistent (if weak) relationships have been observed between action around environmental contamination and age,

education, and income (Walsh et al., 1993; Elliott et al., 1999), exceptions are often observed (e.g Darley, 1994). In addition, many factors have demonstrated strong but inconsistent relationships with environmental action. For example, in different studies gender has played a different role: in certain contexts, women took more action (Brown and Ferguson, 1995; Zelezny et al, 2000), while in others males took more action (Mohai, 1992), and in others there was no difference (Blocker and Eckberg, 1997).

This lack of consistency in results could be due to several factors. First, many previous investigations of environmental action have focussed on a specific factor thought to influence action (for example, gender - Mohai, 1992). Alternatively, investigations have been limited by their reliance on existing data sources, which often provide data a wide range of socio-economic characteristics but few environmental outcomes, and which may fail to collect data on potentially important factors which might influence action. This has limited the extent to which the predictors of environmental action identified can be generalized to other situations.

Second, most studies use dissimilar outcome variables: environmental action has been measured in different studies in different ways (Blake, 2001). In these studies, different types of action (e.g. recycling vs attending protests) have been conflated, and/or one type of action (e.g. consumer behaviour) has been used as a surrogate measure of environmental action more generally.

Finally, few investigations have considered the role of context, especially social context, in the development of environmental action. In particular, the role of social capital - defined in the literature as the networks, norms, and social trust which facilitate collective action (Putnam, 1993) - in relation to environmental action has not been assessed. This is an important gap in the literature, given that involvement in community networks, both formal and informal, is thought to facilitate collective action around issues which affect the community (Putnam, 1993, 1995; Levi, 1996). In practice, this could mean that individuals with significant involvement in community networks are more likely to be involved in community initiatives, including environmental action. As of yet, however, little empirical investigation of the links between social capital and environmental action has been conducted.

In this research, a conceptual framework, drawing on existing literature and informed by the findings of an initial phase of qualitative research, is specified in order to undertake a clear and theoretically informed analysis of possible determinants of environmental action and the linkages between them (Figure 4.1). In particular, the framework allows for an exploration of both the (possible) direct and indirect/mediated relationships between the various factors identified and environmental action. In this framework, a number of potentially interdependent *characteristics* (i.e. of the exposure, individual, social network and wider community) set the stage for environmental action, as these characteristics can affect both *predisposition* (i.e. motivation reflected by values, beliefs and attitudes) and *capacity* (i.e. skills and resources that empower individuals and communities) to take

action (Green and Kreuter, 1991). In other words, predisposition and capacity can *mediate* the relationship between characteristics of the person/ environment/ community and the likelihood and type of *environmental action* taken (Wakefield et al, submitted).

Predisposition to take action is considered in this research to be proportional to the level of concern an individual expresses in relation to environmental issues, as environmental concern is one indicator of predisposition. Concern about environmental problems has been a poor predictor of environmental action in other studies (Seguin, Pelletier, and Hunsley, 1998; Kufrin, 1995; Finger, 1994; Lober, 1995; Elliott et al, 1993). Therefore, environmental concern is seen as a necessary but not sufficient determinant of environmental action (Nevitte and Kanji, 1995).

Predisposition works together with *capacity*, which is also seen as a necessary but not sufficient determinant of action. Individuals are considered to have greater capacity to act if they perceive themselves to be empowered (that is, if they feel in control of their lives and circumstances - Rissel, 1994; Labonte, 1993). A sense of empowerment may result from high relative social status or a high level of education, as well as from the possession of relevant skills (in the case of collective action, skills related to canvassing, organising meetings, writing letters, etc. may be important - Ife, 1995). Empowerment is a first step, many assert, in the development of group solidarity and willingness to act around an issue (Rissel, 1994).

All these factors are thought to relate to environmental action-taking, which can itself be broken down into a continuum of action types. This research pays

particular attention to the differences between different types of environmental actions. While several taxonomies of *political* action exist in the literature (e.g., Arnstein, 1969; Langton, 1978), the full range of possible avenues of participation in contemporary society (Brown, 1997) are not considered in these models, and the often intrusive nature of environmental pollution is not addressed. This research therefore uses a taxonomy developed out of the existing literature and informed by a preceding qualitative investigation (Wakefield et al, 2001), in which four types of environmental action were identified. First, *reappraisal of lifestyle options* is typified by behavioural modifications for coping with the daily life disruption resulting from pollution (e.g., increased cleaning, limiting outdoor activities - Elliott et al., 1999). Because this type of action does not benefit the greater environment, it is not investigated further in this paper (see Wakefield et al, 2001 for further discussion). Second, *personal change* consists of individual behaviours intended to improve environmental quality (e.g. recycling, buying "green" products). This type of action can enhance individual psychological empowerment. However, it does little to develop community control of local environments, or to develop links between community members (Rochon, 1998). *Individual civic action* refers to activities, undertaken alone, which attempt to change societal processes (raising concerns with government or industry, for example). These activities could lead to greater individual empowerment, both psychologically and through the development of skills (Rissel, 1994), as well as to more public influence in this area. They do not, however, develop obvious linkages within the community. Finally, *collective civic*

action (e.g., participating in public protests) has all of the benefits of individual civic action, and also creates links between community members (Hallman and Wandersman, 1992; Rochon, 1998). This taxonomy, then, provides a useful way to catalogue environmental actions, and to account for differences between actions.

4.3 RESEARCH CONTEXT

The site chosen for investigation was the City of Hamilton, Ontario, Canada (Figure 4.2). Hamilton, a city of approximately 600,000 located on the shores of Lake Ontario, is home to a variety of industries, including steel manufacturing. Not surprisingly given its industrial character, Hamilton has had long-standing air quality problems, and has been the focus of numerous investigations of air quality (Jerrett et al, 2001; Hamilton Air Quality Initiative, 1997).

In particular, ongoing research in Hamilton has investigated risk perception, concern, and action related to air pollution. In the first stage of this research programme, a preliminary quantitative survey (n=402) documented air quality concern and health effects in the North End of Hamilton, an area particularly impacted by poor air quality (Elliott et al., 1999). This survey found that, while 82% of respondents were concerned about air pollution, few (11%) reported having contacted government or industry around these concerns (Elliott et al., 1999). A subset of these survey respondents was selected to participate in qualitative interviews in order to gain a more in-depth understanding of issues raised in the survey. The interviewees reported that a number of actions were taken in response

to air pollution, but that most of these actions were *reappraisals of lifestyle options*, undertaken to reduce the impacts of exposure on everyday life rather than to try and reduce the exposure itself (Wakefield et al., 2001). Further, the interviews suggested that social capital was an important factor in facilitating more progressive forms of action (e.g., group civic action - Wakefield et al, 2001).

This is the point of departure for the subsequent investigation of the determinants of environmental action. It was determined that further research would be useful in demonstrating a generalizable relationship between social capital indicators and civic action. A further survey was therefore conducted to examine environmental action among a random sample of households in five areas of the city. It is to the design and administration of this survey that this paper now turns.

4.4 SURVEY DESIGN AND ANALYSIS

To address the objectives of this research, a survey was developed which could collect data on different types of environmental action, and on potential determinants of that action (including social capital). The survey used a combination of open- and closed-ended questions to collect data related to each component of the conceptual framework (Figure 4.1). Items pertaining to neighbourhood quality were drawn from the preliminary survey, as were questions concerning air pollution concern and health concern related to air pollution (Table 4.1). This instrument, in turn, included substantial elements of a questionnaire developed for measurement of

psychosocial impacts of exposure to environmental contaminants in a general population (Elliott et al, 1993).

Data were also collected on neighbourhood interaction and support, community participation, and social trust (Table 4.1). These indicators were drawn from both the initial survey as well as other sources. Levels of civic responsibility were measured using questions from the 1990 World Values Survey (Nevitte, 1996) which ask about socially irresponsible behaviour (e.g. cheating on taxes, reporting damage done to a parked car, claiming illegitimate government benefits, buying stolen goods - Nevitte, 1996). High levels of civic responsibility were inferred if respondents stated that these actions were never justified. Perceived empowerment/self-efficacy was measured by a truncated version of the Rosenberg self-esteem scale which focuses on perceived competence (Ranzjin et al., 1998). This scale includes items such as "I am a useful person to have around" and "I feel I can't do anything right", and is scored in a standardized fashion such that the highest value is +2 and the lowest -2. Environmental action questions (Table 4.2) were primarily drawn from the Hamilton Harbour Watershed ECOWISE Survey (1995). A series of socio-demographic measures were included at the end of the questionnaire as a check on the representativeness of the sample as well as for use in subsequent analysis (Table 4.1). Where possible, socio-demographic items were drawn from the Canadian census questionnaire, and /or matched those used in the preliminary survey. Questions on health status and smoking behaviour were taken from the Ontario Health Survey (1990) and the National Population Health Survey

(1996). The "presence of vulnerables in household" variable indicates a household in which a person over 65, under 5, or with a respiratory ailment resides (these individuals are thought to be at greater risk from environmental pollution, and particularly air pollution - Hamilton Air Quality Initiative, 1997)

The survey was administered to a random sample of households (n = 512) within the urban area of the City of Hamilton (defined here as all contiguous zoning neighbourhoods with populations of 1000 or more). The sample was stratified by area of residence, with the study area divided into 5 sub-areas (identified as Mountain, North, East, Central, and West - Figure 4.2). Approximately 100 households were selected from each area using a City of Hamilton database. The areas were chosen to approximate existing divisions within the City of Hamilton, on the basis of socio-demographic characteristics, physical barriers (e.g. the Niagara escarpment, major highways), and exposure to air pollution (as measured by estimated exposure to suspended particulate (TSP)).

Telephone interviews, averaging 18 minutes, were conducted by the Institute of Social Research at York University between November, 1999, and February, 2000, using double random sampling in order to ensure representativeness by age and gender. The overall response rate was 70%, although rates varied somewhat by area (Central 73%, East 70%, North 66%, Mountain 65%, and West 77%). Overall, the sample is representative of both the study area(s) and Hamilton as a whole. However, the sample has slightly higher proportions of individuals who have completed high school and own their own homes, and slightly lower percentages of people who have

low incomes, than the population as a whole (Table 4.3). In addition, females are over- or under-represented in some areas. These differences should be kept in mind when considering the generalisability of results.

The majority of the survey data was entered directly into the SPSS statistical software package (v10.1). Open-ended responses were entered verbatim into a word processing file along with respondents' identification numbers; these responses were subsequently coded thematically and entered into the data set. Bivariate analysis was performed on the data to identify characteristics related to environmental action, and to identify variables in which categories could be collapsed without the loss of variation within the data. Logistic regression models were then estimated for six outcome variables: sorting glass, cans, etc. for recycling; refusing to buy a product for environmental reasons; donating money to a local environment group; going to a public meeting on a local environmental issue; contacting government, industry, or the media about a local environmental issue; and, attending a public protest about a local environmental issue. In addition, models were estimated for two composite measures: first, having taken two or more environmental actions; and second, having taken one or more civic actions (i.e., attending public meetings, protests, or contacting officials about pollution). The purpose of logistic regression is to identify whether each explanatory variable renders each outcome measure more or less likely *in the context of* other explanatory variables. Logistic regression was considered the most appropriate method of analysis because the outcomes of interest are

dichotomous, while the explanatory variables are both categorical and continuous (Wrigley, 1985; Gilliland, 1998; Luginaah, 2002).

Variables were entered into the models in a staged manner. First, all variables found to be significantly related to an environmental action in bivariate analysis (i.e., where the significance level of the Chi-square test statistic was 0.10 or below) were included for further analysis. Separate models were then estimated for each component of the conceptual framework (i.e., exposure, individual, social network, community, predisposition and capacity) in relation to each outcome. Variables were retained for inclusion in the full model if they were statistically significant within the component model (i.e., if the Wald inclusion test statistic was 0.10 or below), if their removal resulted in a decrease of more than 0.03 in the Rho-square associated with the model, or if their removal resulted in a 10% or greater reduction in respondents correctly classified by the model. In cases where significant correlations were observed between variables (i.e., significance level of 0.01 or below in Spearman's Rank Coefficient for polychoric (rank-ordered) variables and Phi for tetrachoric (binary) variables), models were estimated in which each correlated variable was successively removed in order to determine their independent contribution to the model (those with independent contributions, assessed using the techniques described above, were retained).

The remaining variables were then entered into the full model for the appropriate outcome. Variables were entered in blocks according to their position in the conceptual framework (e.g., all individual variables were entered together, all

exposure variables were entered together, etc.), and a stepwise backward elimination algorithm was used within each block to further reduce the number of variables retained in the model: predictive variables were retained in the model only if the significance level of the Wald inclusion test statistic was 0.10 or below. Finally, interaction terms were calculated for each remaining independent variable in each model, and these terms were entered into the final models using forward-stepwise selection. The results of this analysis are discussed below.

4.5 RESULTS

Bivariate predictors varied by type of environmental action (Table 4.4). However, while not all variables were related to all types of action, all environmental actions were predicted by variables related to each component of the conceptual framework (i.e., exposure, individual, and social network characteristics, as well as indicators of predisposition and capacity).

In general, the bivariate relationships observed between predictors and environmental action are consistent in direction (the exceptions are gender and dwelling type). Certain variables were found, in bivariate analysis to predict different types of environmental action more consistently than others. In particular, social network characteristics (i.e. meeting attendance, environmental group membership, and helping neighbours) and environmental concern were important to all types of environmental action. Some indicators of exposure (e.g., neighbourhood environmental dislike, air pollution bother) are also relatively consistent predictors

of environmental action. Interestingly, language is the only individual characteristic related to most environmental actions reported.

The logistic regression models estimated for each environmental action are summarized in Table 4.5. This table displays the statistical significance of each predictor which remains in a given model, and reports the *relative odds* (and associated 95% confidence interval) for each variable. The relative odds (i.e., the exponential value of the logit coefficient) indicates how much the likelihood of the outcome changes for each unit increase in the independent variable (or in the case of categorical variables, for a change from one category to another). An odds ratio of greater than one indicates an increase in probability; an odds ratio of less than one indicates a decrease. In addition, Table 4.5 provides some summary statistics for each model. The *Rho-square* (ρ^2)) is a goodness-of-fit statistic that indicates whether or not a model is a powerful one (a Rho-square of 0.2 to 0.4 is generally considered to represent a very good fit of the model - see Wrigley, 1985). Information related to the *sensitivity* and *specificity* of each model are also provided in Table 4.5.

In the sections following, the models related to the different types of environmental action identified in the taxonomy described earlier (i.e., personal change, individual civic action, and group civic action) will be described. The two summary models (i.e., having taken two or more environmental actions, and having taken "civic" action) will also be described. Finally, the overall similarities and differences among the models will be highlighted.

4.5.1 Determinants of Personal Change

Of the environmental actions identified in this research, recycling and refusing products for environmental reasons were considered indicators of personal change. In the model for recycling, relatively few significant predictors were estimated, and the low Rho-square of this indicates that this model is not particularly powerful. In this model, the odds ratios indicate that individuals who lived in detached dwellings, spoke English, attended meetings of the city council or school board, or noticed air pollution in their neighbourhood were between two and three times more likely to recycle than those who did not.

The model for refusing/boycotting products for environmental reasons (Table 4.5) has a better goodness-of-fit. In this model, mentioning a neighbourhood environmental dislike and being bothered by air pollution both predicted refusing to buy a product. Certain individual characteristics - gender, age, and language - also led to an increased likelihood of product boycotting. Having friendly neighbours, helping neighbours, and being a member of an environmental group all facilitated refusing products, as did voicing health concerns. Individuals who reported trusting government all or most of the time were *less* likely than others to report refusing products.

Interestingly, there was little overlap between these two models in terms of predictors. Only language was a predictor in both cases. More generally, social network characteristics figured more prominently in relation to product boycott than recycling, as did concern and distrust.

4.5.2 Determinants of Individual Civic Action

Two outcomes - donating to environmental groups and contacting government, etc. about environmental problems - can be considered individual civic actions as defined within the taxonomy. With respect to donating to environmental groups, individuals reporting environmental group membership were (not surprisingly) more likely to report having donated money to an environmental group. Other significant predictors were: mentioning a neighbourhood environmental dislike, being employed, speaking English, and helping neighbours. Respondents who perceived their health was likely to be affected by air pollution were also more likely to donate, although this effect was not significant at $p<0.05$. This model had a relatively low explanatory power, as indicated by the low Rho-square.

The model for contacting government or industry about an environmental issue has, by contrast, a much better fit. In this model, exposure factor did not figure highly, with only those who were bothered by air pollution being more likely to take action. Individuals who reported their health as good or excellent were *more* likely to contact government or industry. Helping neighbours, attending meetings, and being a member of an environmental group were all positively related to contacting government or industry, as was expressing environmental concerns.

Again, little overlap was observed between predictors of individual civic action, although certain social network factors (i.e., helping neighbours and environmental group membership) were significant in both cases. Trust in government was not a significant factor in either model.

4.5.3 Determinants of Group Civic Action

Two group civic actions were investigated in this research: attending a public meeting, and attending a public protest. In the model for attending a public meeting, several exposure-related variables were significant predictors of environmental action: mentioning any neighbourhood dislike, noticing neighbourhood air pollution, and being bothered by air pollution. The only individual characteristic related to meeting attendance was the presence of a vulnerable person in the household (that is, someone who, because of age or respiratory health, could be more susceptible to the effects of air pollution), with the presence of vulnerables leading to less meeting attendance rather than more as might be expected. This result, however, is not significant at $p<0.05$. Individuals who were members of environmental groups and had attended meetings of other sorts (e.g. school board) were more than five times more likely to attend meetings than those who were/had not. In terms of environmental concern, individuals who reported unsolicited concern about air pollution, and who voiced environmental concerns more generally, were more likely to attend a meeting. Finally, those who did *not* trust the government were more likely to attend meetings.

The variables which significantly increased the likelihood of attending a protest were: mentioning a neighbourhood environmental dislike, helping neighbours, being a member of an environmental group, and voicing environmental concerns. Mentioning an effect of air pollution on daily life also increased the likelihood of protest attendance, but was not significant at $p<0.05$. Trust in

government decreased the likelihood of attending a protest. In this model, no individual characteristics were significant.

More overlap was observed among predictors in the group civic action models than in other action types. Specifically, environmental group membership, environmental concern, and government *dis*trust increased the likelihood of both meeting and protest attendance. Interestingly, no individual characteristics are significant below 0.05 in either model.

4.5.4 Determinants of Action in Summary Models

The two composite models, having taken two or more environmental actions, and having taken civic action, were both quite robust, with Rho-squares of above or close to 0.3. In the 2+ action model, individual and social network characteristics were paramount. Specifically, being relatively young, female, married, and speaking English at home increased the likelihood of an individual taking two or more environmental actions, as did finding your neighbours friendly, helping your neighbours, belonging to an environmental group, and attending meetings of the city council/school board. In addition, expressing a neighbourhood-based environmental dislike and being bothered by air pollution were positively related to taking 2+ actions. Environmental concern (i.e., expressing environmental concerns and concern about the health effects of air pollution) was also significant in this model.

Similar to the 2+ action model, in the civic action model individuals who expressed a neighbourhood-based environmental dislike, were bothered by air

pollution, and expressed environmental concerns were more likely to take civic action, as were those who helped their neighbours, belonged to an environmental group, and attended meetings of the city council/school board. In addition, the more community groups an individual belonged to, the more likely they were to have taken civic action. Interestingly, considering neighbours friendly in this model decreased the likelihood of having taken civic action. The only significant individual characteristic in this model is language. Trust in government was also significant, with those who did *not* trust the government more likely to take civic action. In this case, a significant interaction effect between trust in government and finding neighbours friendly was also observed, such that individuals who both mistrusted the government *and* disliked their neighbours were even *more* likely to take action.

4.5.5 Overall differences and similarities across models

In the logistic regression models, significant predictors vary by type of environmental action. The overall strength of the models (as indicated by the Rho-squares) also varies by outcome (Table 4.5). The Rho-squares are highest for the group civic action types, and quite similar between the two actions; for individual civic and personal change behaviours, however, the Rho-squares associated with the models are lower and more variable: in two cases (recycling and donating money), the Rho-squares are below 0.2 and therefore cannot be considered "good fits".

If the models are considered together, the most consistent predictors in each category of the conceptual framework appear to be: *neighbourhood environmental*

dislike and *air pollution bother* (both of which figure in five of eight models); *language* (which also figures in five of eight models); *helping neighbours*, *environmental group membership* (both in six of eight models) and *attending meetings* (in five of eight); *number of environmental concerns* (in five of eight); and *mistrust of government* (which figures in four of eight models). It appears that, while socio-demographic/ individual characteristics figure as predictors of product refusal and recycling (i.e., personal change), these predictors tend not to figure as often in the models of individual civic actions, and hardly at all in group civic action.

4.6 DISCUSSION AND CONCLUSION

In general, results indicate the presence of fundamental differences between predictors of the outcome measures used in both bivariate analysis and logistic regression modelling. This in turn suggests that substantive differences exist between environmental action types. While in most cases, the direction of relationships remained consistent across outcomes, for three variables - gender, dwelling type, and considering your neighbours friendly - this was not observed. These inconsistencies may be explained by differences between the actions themselves. Women may be more likely to boycott products because of their continuing responsibility for domestic tasks such as shopping (Perkins and Demeis, 1994; Burke and McKeen, 1993), while men may feel more comfortable using adversarial approaches such as protests (Shaw, 2000; Reynolds, 1996). In addition, individuals residing in single family dwellings may find it easier to recycle than those

in apartment buildings (a situation observed in other research - Berger, 1997), while individuals in apartments (which are generally in high-density urban areas) may find that they are more aware of protests taking place. The lack of consistency in relation to finding your neighbours friendly is more difficult to explain; however, it may indicate the importance of discomfort (in relation to both neighbours and government) to civic action taking but not to action-taking more generally.

Similarly, predictors which figure in only one environmental action model tend to bear specific relevance to that action. For example, being employed may facilitate individuals making donations, since these individuals may feel more secure about their financial situation (a consideration which is not as relevant for, say, attending a protest).

These explanations, while based in the literature, are hypothetical - the key point here is that all environmental actions are not equal in terms of the factors which facilitate or hinder them. That said, certain broad conclusions about the nature of environmental action can be drawn from this research.

First, all the environmental action models - with the exception of protesting - incorporated variables related to each component of the conceptual framework (i.e., exposure, individual, and social network characteristics, as well as indicators of predisposition and capacity). This provides support for the conceptual and practical validity of the hypothesized framework. In particular, results show the importance of social networks (and social capital factors) in facilitating environmental action. By contrast, individual socio-demographic factors proved much less important in

environmental action than the literature would suggest, particularly with respect to civic action types. Factors related to exposure to environmental problems and to environmental concern were also important in most cases. The exception is recycling behaviour, which has become institutionalized and normalised across the study community; other environmental behaviours were considerably less common.

The results of this research, then, suggest that a much larger emphasis needs to be placed on the role of context in the development of environmental action, and civic action more particularly. Certainly, results indicate that exposure to environmental problems (air pollution and otherwise) in one's neighbourhood can lead to environmental action. Given that exposure is, at least in this case, perceived variably in different places (Wakefield et al., submitted), the role of place-specific factors in environmental action-taking should not be ignored.

Perhaps even more importantly, the results of this research reveal the significance of social context, in the form of social network and social capital factors, to environmental action. The consistent and substantial contribution of these variables to the environmental action models suggests that the lack of attention paid to these factors in past research may have limited their ability to explain the determinants of action. The contribution of these factors was not uniform, however: different social network characteristics had different effects depending on the outcome being investigated. Recycling, for example, was only minimally influenced by social network characteristics, while the perceived friendliness of neighbours encourages environmental action-taking in general, but discourages civic action more

specifically. In addition, not all characteristics have positive impacts on action: trusting in the government, for example, reduces the likelihood of environmental action in all cases where this variable is significant. So, while results indicate that social context factors play a significant role in environmental action, their effect is not uniform. In particular, factors related to participation in social networks (whether formally, through meeting attendance and group membership, or informally by helping neighbours) appear to facilitate environmental actions, while trust in (and contentment with) government and neighbourhood appears to discourage certain environmental actions. This suggests a need to engage in greater depth with the literatures around neighbourhood and neighbouring, in order to help tease out the relationships between local linkages and civic participation.

This paper makes a substantial contribution to the literature by beginning to explore the nature of the links between certain social relationships and various environmental actions, and by identifying the importance of social context and interpersonal, neighbourhood-level factors to environmental action. However, additional research is also needed to continue the development of the social capital concept, and particularly to identify the importance of different facets of social capital (e.g., formal group involvement versus social trust) to civic action. Continued research in this area is central, as many jurisdictions come to rely on voluntary participation to guide decision-making and manage public-sector initiatives, and as

the concept of social capital is increasingly incorporated into sustainable development and public health practice.

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4.8 REFERENCES

Ackelsberg, Martha. 2001. (Re)conceiving politics? Women's activism and democracy in a time of retrenchment. Feminist Studies 27 (2): 391-418.

Arnstein, S. 1969. A ladder of citizen participation. Journal of the American Planning Association, 35, 216-224.

Berger, Ida E. 1997. The Demographics of Recycling and the Structure of Environmental Behavior. Environment and Behavior; 29, 4, 515-531.

Blake DE, 2001, Contextual effects of environmental attitudes and behavior. Environment and Behavior 33 708-725

Blocker, T. Jean, and Eckberg, Douglas L. 1997. Gender and Environmentalism: Results from the 1993 General Social Survey. Social Science Quarterly, 78 (4): 841 - 858.

Bourdieu, P. 1986. The Forms of Capital. In John G. Richardson, ed., Handbook of Theory and Research for the Sociology of Education. New York: Greenwood Press.

Brown, M.P. 1997. RePlacing Citizenship: Aids Activism and Radical Democracy. New York: Guilford Press.

Brown, P. and Ferguson, F.I.T. 1995. 'Making a big stink': women's work, women's relationships, and toxic waste activism. Gender and Society 9 (2): 145 - 172.

Burke, Ronald J., and McKeen, Carol A. 1993. Career Priority Patterns among Managerial and Professional Women. Applied Psychology: An International Review, 42 (4), 341-352.

Cary, J. 1993. The nature of symbolic beliefs and environmental behavior in a rural setting. Environment and Behavior 25: 555 - 576.

Chavis, D.M., and Wandersman, A. 1990. Sense of Community in the Urban Environment: A Catalyst for Participation and Community Development. American Journal of Community Psychology 18: 55-81.

Darley, S. 1994. But the working class don't care about the environment...do they? Social Alternatives 13: 37 - 41.

Dietz T, Stern PC, Guagnano GA, 1998, Social Structural and social psychological bases of environmental concern. Environment and Behavior 30 450-471708-725

Elliott, S.J., Cole, D.C., Krueger, P. et al. 1999. The power of perception: health risk attributed to air pollution in an urban industrial neighbourhood. Risk Analysis 19 (4): 615 - 628.

Elliott, S.J., Taylor, S.M., Eyles, J.D., et al. 1993. Modelling psychosocial effects of exposure to solid waste facilities. Social Science and Medicine 37 (6): 791 - 804.

Finger, M. 1994. From knowledge to action? Exploring the relationships between environmental experiences, learning, and behavior. Journal of Social Issues 50 (3): 141-160.

Gilliland, J.A. 1998. Modeling residential mobility in Montreal, 1860 - 1900. Historical Methods 31 (1): 27 - 42.

Green, L.W. and M.W. Kreuter. 1991. Health Promotion Planning: An Educational and Environmental Approach. 2nd ed. Mountain View, CA: Mayfield Publishing.

Greenberg M. and Schneider, D. 1997. Neighborhood quality, environmental hazards, personality traits, and resident actions. Risk Analysis 17 (2):169-175.

Gould, K.A. 1993. Pollution and Perception: Social Visibility and Local Environmental Mobilization. Qualitative Sociology 16: 157-178.

Hallman, W.K. and A. Wandersman. 1992. Attribution of responsibility and individual and collective coping with environmental threats. Journal of Social Issues 48 (4): 101 - 118.

Hamilton Air Quality Initiative (HAQI). 1997. Summary Report. Hamilton: Regional Municipality of Hamilton-Wentworth..

Hay, Colin. 1998. Globalisation, welfare retrenchment and 'the logic of no alternative': why second-best won't do. Journal of Social Policy 27 (4): 525-32.

Ife, J. 1995. Community Development. Melbourne: Longman.

Jerrett M, Burnett RT, Kanaroglou P, Eyles J, Finkelstein N, Giovis C, Brook R, 2001, A GIS-environmental justice analysis of particulate air pollution in Hamilton, Canada. Environment and Planning A 33: 955-973

Kufrin, K. 1995. Environmental attitudes and behavior: a missing link. Socijalna Ekologija 5 (1): 1-20.

Labonte, R. 1993. Community development and partnerships. Canadian Journal of Public Health 84: 237-240.

Langton, S. (ed.) 1978. Citizen Participation in America. Lexington, Mass.: D.C. Health.

Levi, M. 1996. Social and unsocial capital: A review essay of Robert Putnam's Making Democracy Work. Politics and Society 24(1):45-55.

Lober, D.J. 1995. Why protest? Some public behavioural and attitudinal responses to siting a waste disposal facility. Policy Studies Journal 23 (3): 499-518.

Luginaah, I.N., Taylor, S.M., Elliott, S.J., and Eyles, J.D. 2002. Community Reappraisal of the perceived effects of a petroleum refinery. Social Science and Medicine 55: 47 - 61.

Mohai, P. 1992. Men, women, and the environment: an examination of the gender gap in environmental concern and activism. Society and Natural Resources, 5: 1-19.

Nevitte N. (1996) The Decline of Deference. Peterborough ON: Broadview Press.

Nevitte, N. and Kanji, M. 1995. Explaining environmental concern and action in Canada. Applied Behavioral Science Review 3 (1):85-102.

Northridge M.E. and P.M. Shepard. 1995. Environmental racism and public health. American Journal of Public Health 87 (5): 730-731.

Obregon-Salido F, Corral-Verdugo V, 1997, "Systems of belief and environmental conservation behavior in a Mexican community" Environment and Behavior 29 213-235

Perkins, W.H., and Demeis, D.K. 1994. Gender and Family Effects on the "Second Shift" Domestic Activity of College-Educated Young Adults. Papers of the American Sociological Association (ASA). Hobart & William Smith Colls, Geneva NY.

Putnam, R. 1995. Bowling alone: America's declining social capital. Journal of Democracy 6 (1): 65-78.

Putnam, R. 1993. Making Democracy Work: Civic Traditions in Modern Italy. Princeton, NJ: Princeton U.P.

Ranzjin, Rob, Keeves, John, Luszcz, Mary, and Feather, N.T. 1998. The role of self-perceived usefulness and competence in the self-esteem of elderly adults: confirmatory factor analysis of the Bachman Revision of Rosenberg's Self-Esteem Scale. Journal of Gerontology 53B (2): P96-P104.

Reynolds, Margaret. 1996. Towards a Republic and Women's Equal Participation in Parliament. Journal of Australian Studies, 47, 87-94.

Rissel, C. 1994. Empowerment: the holy grail of health promotion? Health Promotion international 9: 39-47.

Rochon, T.R. 1998. Culture Moves: Ideas, Activism, and Changing Values. Princeton, NJ: Princeton University Press.

Seguin, C., Pelletier, L.C., and Hunsley, J. (1998). Toward a model of environmental activism.. Environment and Behavior, 30, 628-652.

Shaw, Sylvia. 2000. Language, Gender and Floor Apportionment in Political Debates. Discourse and Society 11, 3, 401-418.

Tranter, B. 1996. The Social bases of environmentalism in Australia. Australian and New Zealand Journal of Sociology 32(2):61-85.

Vorkinn M, Riese H, 2001, "Environmental concern in a local context: the significance of place attachment" Environment and Behavior 33 249-263.

Wakefield, S., Elliott, S., Cole, D., & Eyles, J. 2001. Environmental risk and (re)action: air quality, health, and civic involvement in an urban industrial neighbourhood. Health and Place, 7, 163-177.

Wakefield, Sarah E.L., Elliott, Susan J., Cole, Donald C., and Eyles, John D. Environmental concern and civic action: A case study. Submitted to Environment and Behavior (October 2001).

Walsh, E., Warland, R., and Smith, D.C. 1993. Backyards, NIMBYs and incinerator sitings: implications for social movement theory. Social Problems 40 (1): 25-38.

Wrigley, Neil. 1985. Categorical Data Analysis. London: Longman.

Zelezny, LynetteC., Chua, Poh-Pheng, and Aldrich, Christina. 2000. Elaborating on gender differences in environmentalism. Journal of Social Issues, 56 (3), 443 - 457.

TABLE 4.1: Type, Coding, and Distributions of Explanatory variables

Component of Framework/ Variable name	Type	Coding (* = reference category)	# reporting (% reporting)
Issue/Exposure Characteristics			
Neighbourhood dislike mentioned	categorical	dislike mentioned *vs* no dislike mentioned*	295 (58)
Neighbourhood environmental dislike	categorical	environmental dislike mentioned *vs* no dislike *	32 (6)
Past summer noticed air pollution	categorical	yes *vs* no/don't know*	301 (59)
Air pollution bother	categorical	bothered more than half the time *vs* less than half*	174 (65)
Air pollution affected daily life	categorical	yes *vs* no/don't know*	119 (23)
Individual Characteristics			
Age category	categorical	Less than 40 years old, 40 - 59, 60+ *	Less than 40 = 129 (25) 40 - 59 = 204 (40) 60 + = 174 (34)
Gender	categorical	male *vs* female*	246 (48)
# in household	ordinal	1, 2, 3, 4 or more*	1 = 133 (26) 2 = 146 (29) 3 = 101(20) 4+ = 125(25)
Marital status	categorical	married/partner *vs* no current partner/refused	290 (57)
Employment status	categorical	working for pay *vs* not working for pay *	292 (57)
Education	categorical	less than high school *vs* high school + *	145 (29)
Household income	categorical	less than $30 000/year *vs* $30 000+/year*	132 (34)
Home ownership	categorical	owned *vs* rented/other*	359 (71)
Dwelling type	categorical	single family detached *vs* other*	306 (61)
Language spoken at home	categorical	English *vs* other*	463 (90)
Health status	categorical	excellent/very good/good *vs* fair/poor *	307 (80)
Vulnerable person in household	categorical	vulnerable person present *vs* not present*	421 (82)

TABLE 4.1, continued: Explanatory variables

Component of Framework/ Variable name	Type	Coding (* = reference category)	# reporting (% reporting)
Social Network Characteristics			
People in neighbourhood friendly	categorical	friendly *vs* not friendly*	463 (90)
How often talk to neighbours	categorical	less than every week *vs* once a week or more*	129 (25)
How often help neighbours/ask for help	categorical	never, once/twice a year, once/twice a month*	108 (21)
# of volunteer organizations belong	continuous	(0 - 22)	mean = 0.76
Member of environmental group	categorical	yes *vs* no *	43 (8)
Attend meetings of city council/school board	categorical	yes *vs* no*	173 (34)
Wider Community Characteristics			
Area of residence	categorical	Central, East, Mountain, North, West*	Central = 94 (18) East = 101 (20) Mountain = 112 (22) North = 83 (16) West = 122(24)
Predisposition			
Unsolicited air pollution concern	categorical	mentioned *vs* not mentioned*	191 (37)
# of environmental concerns mentioned	continuous	(maximum = 3)	mode = 1
Health likely affected by air pollution	categorical	very/somewhat likely *vs* unlikely*	339 (66)
Capacity			
Most people can be trusted	categorical	most can be trusted *vs* can't be too careful*	236 (46)
Trust government to do right	categorical	most of the time, sometimes, almost never*	Most of time = 92 (18) Some of time = 268 (53) Almost Never = 133 (26)
Civic responsibility index score	continuous	(0 = low, 4 = high)	mean = 3.3
Self-esteem scale score	continuous	(-2 = low, +2 = high)	mean = 1.6

TABLE 4.2: Frequency of Environmental Action-Taking in the Past Two Years

Components of Framework and Variables (n = 512 for all)	Total # reporting (% reporting)
Personal Change	
Regularly sort materials for recycling	466 (91)
Refused to buy a product for environmental reasons	223 (44)
Donated money to a local environmental group	102 (20)
Individual Civic Action	
Contacted government or industry about local environmental issue	81 (16)
Group Civic Action	
Attended a public meeting about a local environmental issue	59 (12)
Attended public protest about local environmental issue	29 (6)
Summary Measures	
Have taken 2 or more of above actions	277 (54)
Have taken "civic action" (i.e., one or more of contacting government etc., attending meetings, attending protests)	110 (21)

TABLE 4.3: Sample Characteristics

Characteristic	Central		East		Mountain		North		West		Total Study Area - Sample	*Total Study Area - Census*	*Hamilton CMA**
	Sample	*Census*	Sample	*Census*	Sample	*Census*	Sample	*Census*	Sample	*Census*			
% female	52	*51*	60	*51*	54	*52*	42	*51*	50	*52*	52	*51*	***51***
% Canadian born	79	*70*	76	*71*	72	*76*	77	*78*	75	*75*	76	*74*	***76***
% English in home	87	*81*	90	*81*	93	*87*	93	*86*	89	*90*	90	*85*	***89***
% education <high school	32	*40*	26	*39*	32	*37*	37	*51*	18	*26*	28	*37*	***34***
% income <$30 000	31	*57*	16	*32*	23	*35*	44	*51*	13	*26*	24	*39*	***33***
% own home	47	*33*	74	*66*	71	*67*	77	*60*	79	*72*	70	*60*	***65***

*CMA = Census Metropolitan Area

Source: Statistics Canada, 1996 Census

TABLE 4.4: Bivariate predictors ($p<0.05$) of environmental action, all types, with direction of relationship indicated by + (positive), - (negative), or inv-U (inverted U)

Component of Framework / Predictors	recycle	donate $	refuse product	contact	public meeting	protest	2+ actions	civic action
Issue/Exposure Characteristics								
Neighbourhood dislike		+	+	+	+	+	+	+
Environmental dislike		+	+	+	+	+	+	+
Notice air pollution	+		+		+		+	+
Air pollution bother	+		+	+	+	+	+	+
Air pollution affected daily life				+	+	+	+	+
Individual Characteristics								
# in household	inv-U*		inv-U				inv-U	
Age category		inv-U	inv -U	inv-U	inv-U		inv-U	inv-U
Gender (Female)			+	-		-	+	-
Health status		+	+	+	+		+	+
Education	+		+	+	+		+	+
Marital status	+			+		+	+	+
Employment status		+	+	+			+	+
Income category		+	+	+			+	+
Home ownership	+			+	+		+	+
Dwelling (detached)	+					-	+	+
Born in Canada	+		+	+	+		+	+
Language (English)	+	+	+	+	+		+	+
Social Network Characteristics								
Neighbours friendly	+	+	+				+	
Talk to neighbours	+						+	
Help neighbours	+	+	+	+	+	+	+	+
# groups a member		+		+	+		+	+
Environmental group	+	+	+	+	+	+	+	+
Attended meetings	+	+	+	+	+	+	+	+
Predisposition								
# of environmental concerns mentioned	+	+	+	+	+	+	+	+
Unsolicited air pollution concern	+		+		+		+	
Health likely affected by air pollution	+	+	+	+		+	+	+
Capacity								
Trust in government			-	-	-	-	-	-
Civic responsibility	+		+			-	+	
Self-esteem	+	+	+		+		+	

* inverted U

TABLE 4.5: Odds Ratios of Significant Predictors of Environmental Action, all Types, in Logistic Regression

Predictors	Odds Ratios with 95% Confidence Intervals and Significance Levels (* p < .05, ** p < .01, ***p < .001)							
	recycle	refuse product	donate $	contact	public meeting	protest	2+ actions	civic action
Neighbourhood dislike				-	2.55* (1.1-5.9)	-	-	
Environmental dislike	-	5.57* (1.4 - 21.4)	2.57* (1.0-6.3)	-	-	4.77*(1.3-16.9)	3.17 (0.9-10.1)	3.42* (1.2 -9.7)
Notice air pollution	3.18**(1.5-6.7)		-	-	2.87* (1.1-7.9)	-	-	-
Air pollution (AP) bother	-	2.84*** (1.7-4.9)	-	3.29***(1.9-5.8)	3.37** (1.6-6.9)	-	3.16***(1.9-5.3)	3.69***(2.1-6.6)
AP affect daily life	-		-			2.47 (0.99-6.2)	-	-
Age category								-
Less than 40	-	2.76** (1.4-5.5)	-	-	-	-	2.31**(1.2-4.3)	
40-59	-	2.89** (1.6-5.3)	-	-	-	-	2.19**(1.3-3.8)	
Gender	-	0.29***(0.2-0.5)	-	-	-	-	0.39***(0.2-0.6)	-
Marital status	-	-	-	-	-	-	1.73* (1.1-2.8)	-
Employment status	-	-	2.12** (1.2-3.6)	-	-	-	-	-
Dwelling type (detached)	3.03**(1.5-6.3)	-		-	-	-	-	-
Language	2.35 (0.9-6.1)	10.0***(2.8-35.3)	4.57* (1.0-20.7)	-	-	-	11.59***(3.7-35)	15.13* (1.5-149)
Health Status	-	-	-	2.49* (1.0-6.2)	-	-	-	-
Vulnerable person	-	-	-	-	0.43 (0.2-1.0)	-	-	-
Neighbours friendly	-	3.37* (1.1-9.9)	-	-	-	-	2.13 (0.9-5.2)	0.33** (0.1-0.4)
Help neighbours								
Never	-	0.51 (0.2-1.1)	0.26** (0.1-0.6)	0.26* (0.1-0.8)	-	0.55 (0.1-2.2)	0.41** (0.2-0.8)	0.27** (0.1-0.7)
Once or twice a year	-	0.54* (0.3-0.9)	0.35***(0.2-0.6)	0.81 (0.4-1.5)	-	0.27* (0.1-0.8)	0.45** (0.3-0.8)	0.53* (0.3-0.9)
# Groups belong to	-	-	-	-	-	-	-	1.29* (1.1-1.7)
Member of environmental group	-	-	4.63***(2.3-9.3)	2.71* (1.3-5.8)	5.27***(2.2-12.7)	4.8**(1.7-13.7)	4.71** (1.6-13.9)	3.49** (1.5-8.4)
Attended meetings	3.13* (1.2-8.4)	-	-	2.48** (1.4-4.4)	7.15***(3.3-15.5)	-	2.02** (1.2-3.4)	3.99***(2.2-7.3)
Unsolicited AP concern	-	-	-	-	0.49 (0.2-1.1)	-	-	-
# of environmental concerns	-	-	-	2.36***(2.4-1.7)	1.72* (2.2-2.7)	2.59**(1.5-4.4)	1.82***(1.3-2.4)	2.21***(1.6-3.1)
Health affected by AP	-	2.69** (1.5-4.9)	1.70 (0.9-3.1)	-	-	-	2.45** (1.4-4.2)	-
Trust in government								
All/most of the time	-	0.34* (0.1-0.8)	-	-	0.57 (0.2-1.8)	0.49 (0.1-1.9)	-	0.35 (0.1-1.2)
Some of the time	-	0.59 (0.3-1.1)	-	-	0.37** (0.2-0.8)	0.17**(0.1-0.5)	-	0.28** (0.1-0.6)
Trust government X neighbours friendly	-	-	-	-	-	-	-	0.85* (0.7-0.9)
Model Rho-square (ρ^2)	0.13	0.24	0.14	0.24	0.33	0.3	0.29	0.35
Sensitivity	0	75	83	86	89	96	71	87
Specificity	92	70	64	58	59	88	75	72

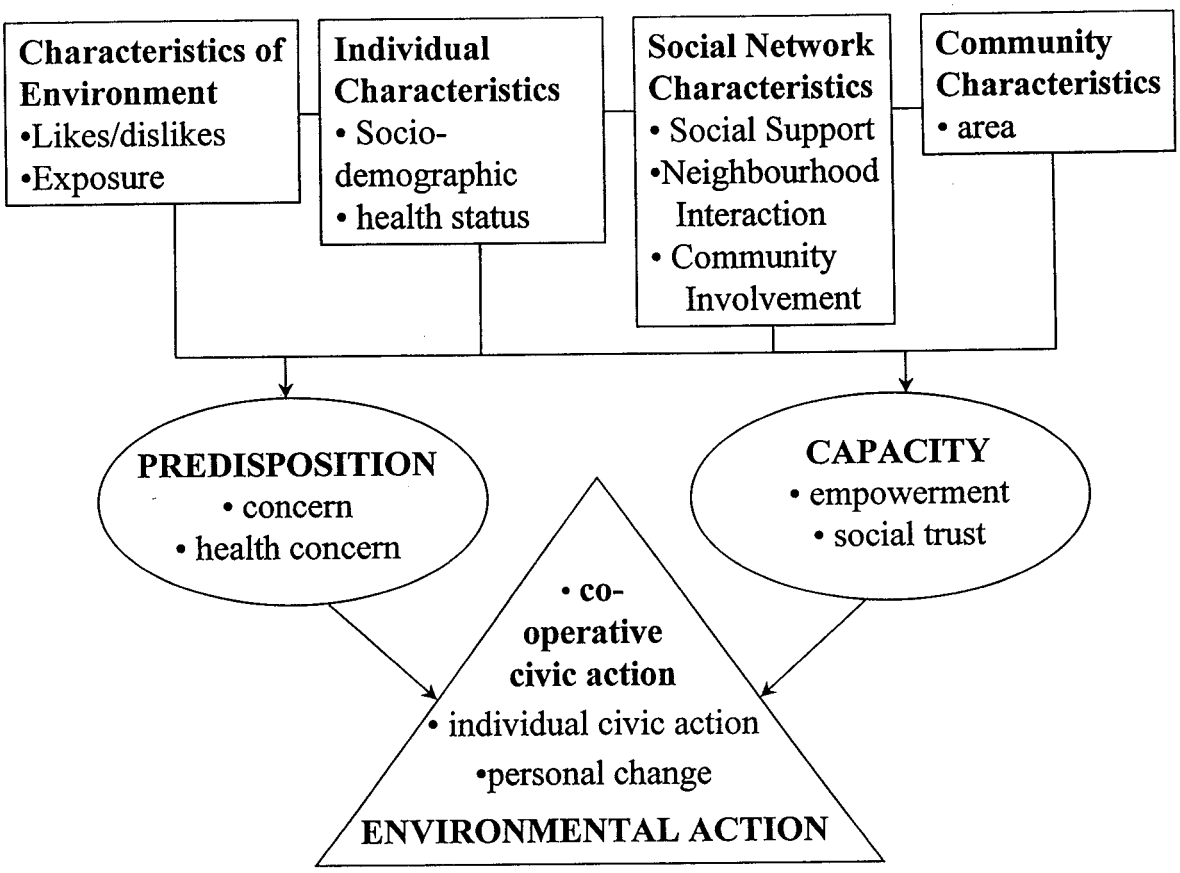

FIGURE 4.1:
Conceptual Framework

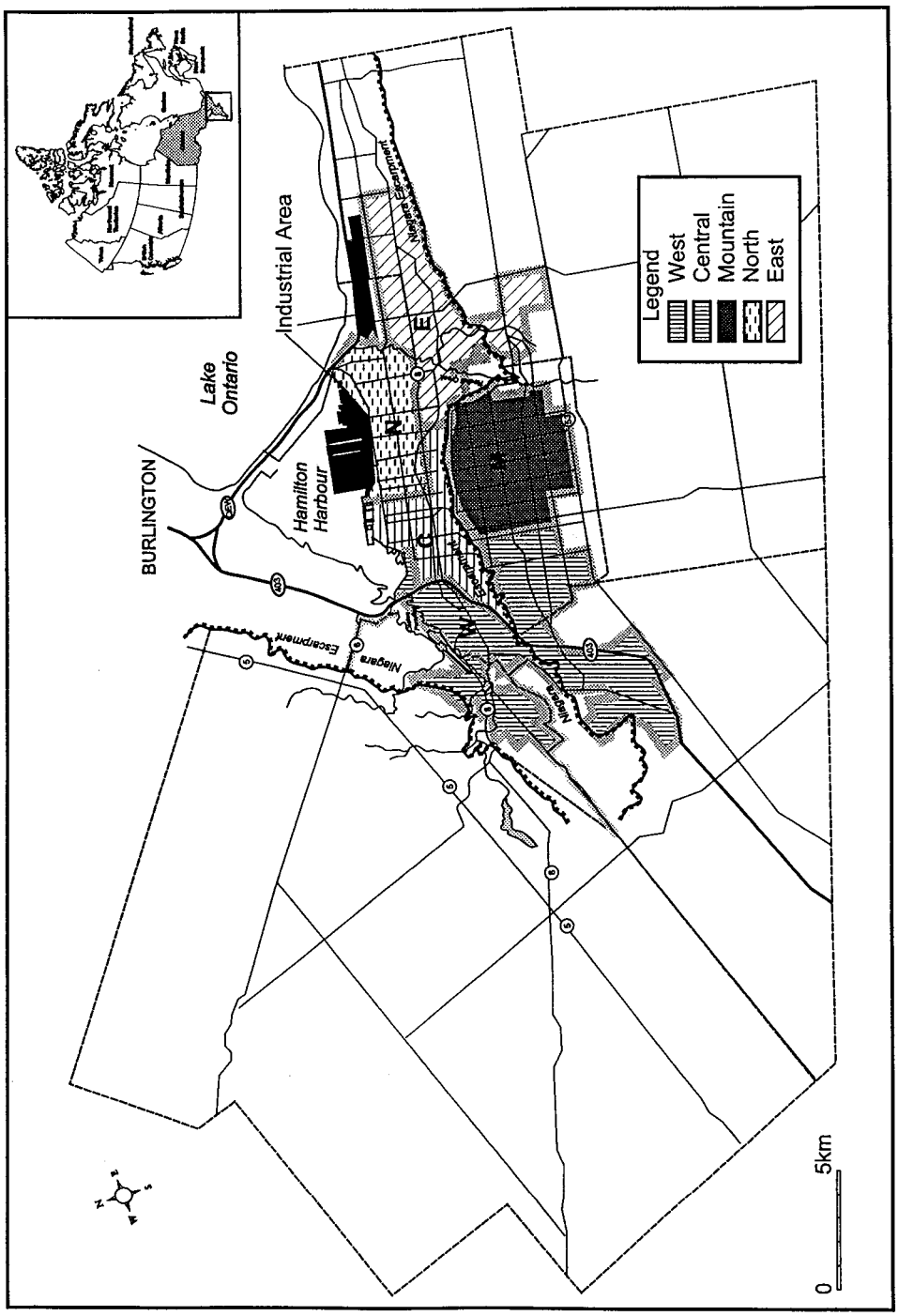

FIGURE 4.2:
Location of the Study Areas Within the City of Hamilton

CHAPTER 5

DISCUSSION AND CONCLUSIONS

5.1 SUMMARY OF KEY FINDINGS

This dissertation had three substantive chapters. In **Chapter 2**, risk perceptions and concerns related to adverse air quality in the most affected area of the city (i.e., North Hamilton) were investigated using in-depth interviews. The results presented suggest that air pollution risk perceptions in this area were influenced by everyday life experiences. Respondents were very aware of sensate exposures, and could detail even small geographic and temporal variations in these exposures. However, respondents used contextual information (e.g., the presence of other problems in the community) to assign relative importance to air pollution concerns; others about social issues as crime, or just making ends meet were often paramount.

Environmental action was also investigated in Chapter 2, and a taxonomy of environmental action was outlined. In the taxonomy, four types/categories of active responses to environmental risk were identified: reappraisal of lifestyle options, personal change, individual civic action, and group civic action. Actions in each category were found to differ in terms of the numbers of respondents using them, and

the personal and societal benefits derived from their use. Reappraisal of lifestyle options in relation to air pollution was common amongst respondents, while involvement in group activities to directly reduce exposure to air pollution was rare. Three categories of this taxonomy - personal change, individual civic action, and group civic action - were explicitly investigated in the quantitative component of the research.

Two factors of potential importance to environmental action, place attachment and social capital, were explicitly investigated in this chapter. Results indicated that, while there is often considerable interplay and overlap between place attachment and social capital, social capital seems to influence civic action-taking to a greater degree, by facilitating access to community networks and increasing perceived efficacy.

Intra-urban variation within Hamilton was examined in **Chapter 3**. Results indicate that levels of reported education, and income, as well as housing type and tenure, and family status varied by area, with the highest levels of education, income, and home ownership in the West. By contrast, respondents perceived air pollution most in the North and Central areas. Little variation was observed between areas in terms of social network characteristics, or in measures of predisposition (particularly overall environmental concern), capacity, and environmental action. Group civic action was uncommon in all areas, while personal changes like recycling were very common.

Potential determinants of civic action taken in response to environmental concerns were also identified in this chapter using bivariate analysis. While not *all* of the characteristics specified in the conceptual framework influenced environmental action-taking, many factors related to individual characteristics, exposure perception measures, social network characteristics, predisposition, and capacity were found to influence environmental action. Area of residence, however, was *not* a significant predictor of environmental action. These results were used to inform the development of the logistic regression models found in Chapter 4.

In **Chapter 4**, logistic regression modelling was used to identify the determinants of a number of different environmental actions. Results indicate that the predictors of environmental action vary considerably according to the type of environmental action modelled; this suggests that there are substantive differences between environmental action types. Variables related to each component of the conceptual framework featured in each of the models - that is, while not every potential factor in each category was significant, at least one characteristic relevant to exposure, individual, and social network, as well as to predisposition and capacity to act were relevant in most contexts. This suggests that the conceptual framework is an effective means of structuring the investigation of environmental action.

Factors related to exposure to environmental problems and to environmental concern figured in most models. Social network and social capital factors played a large and consistent role in facilitating environmental action, while individual socio-

demographic factors were less important, particularly in terms of group civic action.

5.2 METHODOLOGICAL IMPLICATIONS

This research contributes to the methodological literature in three key areas. First, it highlights the importance of specificity in measurement, particularly in relation to environmental action. In past research, different types of action have often been conflated (e.g. recycling is seen as equivalent to attending protests), or one type of action (e.g. consumer behaviour) has been used as a surrogate measure for all environmental actions (cf. Blake, 2001). While other recent research has also begun to tease out the differences between types of environmental action (e.g., Uyeki, 1999; Stern, 2000), differences between individual and civic actions, in particular, continue to be ignored.

In this research, the potential for dissimilarity between environmental actions was explicitly recognized, and therefore a taxonomy of environmental action was developed to guide data collection. This taxonomy was then modified based on the results of the in-depth interview analysis. Survey results supported this characterization of action types by demonstrating that the frequency of each type of action varied (for example, recycling was more commonly observed than protest attendance), and that each action type had different predictors. This research, therefore, emphasizes the importance of collecting data on a variety of outcome measures.

Furthermore, this research shows the importance of using a theoretically informed approach to data collection. One of the strengths of this research was the explicit use of theory to inform structure of the empirical investigation. The conceptual framework specified at the beginning of the research (described in previous chapters, and laid out in Figure 5.1) drew on the literatures around environmental risk perception, environmental concern, social capital, and environmental action to help structure data collection and analysis. This framework, which highlighted the importance of exposure, individual, and social network characteristics to the development of predisposition and capacity to take environmental action, was validated by the results of both the qualitative and quantitative analysis. The development of this conceptual framework is particularly important given recent calls for "synthetic theories or models that incorporate variables from more than one [broad class of explanatory variables], postulate relationships among them, and use them to explain one or more types of environmentally significant behavior" (Stern, 2000, 418).

Finally, and perhaps most importantly, this research provides an example of the effective use of a mixed-method research design. A number of recent papers outline the merits of combining qualitative and quantitative research (Baum, 1995; Graham, 1999), but these papers rarely address the technical issues related to timing, administration, and synthesis which come to the fore when the data is actually being collected and analysed. While methods of data integration are not explicitly stated in the substantive chapters of this thesis, there *was* considerable synthesis of the data

collected in the qualitative and quantitative components of this research. The way in which the integration was structured is outlined in Chapter 1; to reiterate, the results of the qualitative component of this research programme enhanced the conceptual framework and informed survey development. In addition, while the primary analysis of the interview data occurred early in the research programme, the interviews were revisited during the survey analysis to help interpret survey results and identify and resolve discrepancies between findings from the two methods (Green et al., 1989; Brewer and Hunter, 1989; Winchester, 1999).

The qualitative interviews were also used to elaborate specific aspects of the conceptual framework which were difficult to explore using a quantitative approach (cf. Elliott, 1999), and to provide a rich description of various phenomena (including air pollution experience and social capital) in the respondent's own words (Eyles, 1998; Strauss and Corbin, 1990). The quantitative component, on the other hand, was used to extend the investigation to more areas of Hamilton, and to provide results which were more readily generalised.

The mixed-method approach used here allowed the investigation of a wider range of phenomena, while respecting the limitations of the two data sets (Mason, 1994; Baum, 1995). Quantitative and qualitative methods, on their own, are each limited by the way the relationship between the researcher and the research participants is conceptualised, the type of research strategy used, and the nature of the data generated (Eyles, 1998). As Eisner (1981, 9) notes, "looking through one eye

never did provide much depth of field": mixed-method approaches can add a new depth and range of vision to environmental health research if used to address appropriate research questions. By using more than one method in this study, the scope of the investigation was widened, and a more comprehensive study of environmental perception, concern, and action around air quality in Hamilton was therefore conducted. In addition, the convergence of results in the qualitative and quantitative investigations (for example, with respect to the importance of social capital, and in particular of social networks, to environmental action) lends strength to the conclusions drawn, since despite the differences between the two methods, similar results were seen (Quinn-Patton, 1990; Greene et al., 1989; Baxter and Eyles, 1997).

The use of a mixed-method approach required more time and more varied expertise to administer and analyze all study components (Mason, 1994; Creswell, 1994). However, many other potential difficulties associated with a mixed methodology (including difficulties in meeting journal page limits and limited acceptance of the approach) were not experienced by this researcher. This may be due to the approach taken by the researcher to publication (i.e., to publish the components of the research separately), and an academic environment supportive of mixed-method research (which may or may not be widespread). Overall, however, the benefits of using multiple methods within one research project greatly outweighed the drawbacks. This research, therefore, illustrates the benefits derived

from a mixed-method research design, and in particular demonstrates how these methods can complement and inform each other when used in tandem to collect information on similar constructs (e.g., environmental risk perception, social capital). It also provides an example of how to combine qualitative and quantitative methods in practice.

5.3 SUBSTANTIVE AND THEORETICAL CONTRIBUTIONS

This thesis makes a number of important contributions to our existing understanding of environmental action, social capital, and civic action more generally. The results of this research indicate that environmental action is widespread. Not only is there reactive lifestyle change in areas exposed to environmental contamination, but personal changes such as recycling have been undertaken by the majority of the study population. However civic action, and group civic action in particular, was rare throughout the study area. This adds to the existing literature around environmental action, which rarely provides an indication of the relative rates of participation in given types of environmental action.

The taxonomy of environmental action developed from this research provides a mechanism to characterize different environmental actions according to their effectiveness in empowering individuals and in achieving substantive change within a community. The taxonomy incorporates existing literature around political action (e.g., Arnstein, 1969; Langton, 1978), but adds environmental specificity. In the taxonomy developed in this thesis, reactive behavioural modifications (such as

staying indoors on days with poor air quality) were seen as least effective in providing psychological or social benefits to those who undertook these actions[2]. Conversely, group civic actions were seen as most effective in increasing respondents' perceived empowerment, and in developing social ties between community members. The other action types, personal change and individual civic action, both provide some degree of psychological benefit but provide little opportunity for social network development. The development of this taxonomy, therefore, adds to the literature by highlighting environmental action as a distinct type of political action, which often takes place outside of the traditional political sphere (cf. Brown, 1997). The taxonomy also highlights the differences between environmental actions, helping to develop a new understanding of the differences between action types.

The in-depth interviews suggest that issues related to capacity and self-efficacy play a large role in the decision to take civic action. Respondents felt that they lacked the skills and resources required (i.e., the capacity) to take civic action; in particular, many were unsure of how to "go about" civic action, and did not know at whom to direct their energies. However, individuals who were part of certain (more "active") local social networks reported being more familiar with whom to

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2 It should be noted, however, that while behavioural modifications do not address the root causes of environmental problems, they may deliver the greatest relief from a particular situation (e.g., staying indoors on a poor air quality day will prevent respiratory discomfort better in the short term than a letter to the Environment Minister).

contact in relation to local social problems, and how. This finding therefore points to the importance of social capital in facilitating civic action around environmental issues, consistent with conclusions of other research (Putnam, 1993). It goes beyond past research, however, by suggesting that access to information networks, as one component of social capital, is particularly relevant to civic action around environmental issues.

The results of the bivariate analysis and logistic regression modelling support the conclusion that social capital, particularly in the form of social networks, is important to environmental action. The consistent and substantial contribution of social network variables to the environmental action models suggest that the lack of attention paid to these factors in past research may account for their inability to adequately explain environmental action. In addition, this investigation adds to past research which has focussed on individual characteristics and behaviours (Zelezny and Shultz, 2000; Stern, 2000) and generally neglected social structures and interactions (Engel and Potschke, 1998).

This research also suggests, however, that the contribution of social capital variables to environmental action is not uniform. Instead, different social network characteristics have different effects depending on the outcome being investigated. In particular, factors related to participation in social networks (whether formally, through meeting attendance and group membership, or informally by helping neighbours) appear to facilitate environmental actions, while trust in (and contentment with) government and neighbourhood appears to discourage certain

environmental actions. These are important distinctions, which begin to differentiate elements within the social capital concept. Given that this concept has been criticised for its amorphous and overly inclusive nature (Fine, 1999; Foley and Edwards, 1999; Popay, 2000; Mohan and Stokke, 2000), the elaboration of these differences is central to the development of social capital as a focus of investigation within environmental health and elsewhere (Forbes and Wainright, 2001).

The results of this research also suggest that greater emphasis should be placed on the role of place in the study of environmental action. Certainly, this research showed that, while environmental differences among places were not sufficient on their own to generate environmental action, they played an important role in predisposing individuals to action. In this research, exposure was perceived variably in different places, and these subjective, "insider" perceptions in and prioritizations of environmental quality issues had implications for environmental concern (as in Greenberg and Schneider, 1996) and for action-taking.

Further, while environmental concern was not localised, results show ed that exposure did indeed facilitate certain kinds of environmental action. This finding, then, adds to the literature around environmental risk perception and concern (e.g., Elliott et al, 1993; Elliott, 1998; Luginaah et al., 2000), by emphasizing the importance of place-specific exposures to a wider range of environmental actions than had previously been investigated.

The role of place with respect to capacity for environmental action is perhaps less obvious, but no less important. This research highlighted well-documented differences between areas of Hamilton with respect to socio-demographic characteristics (e.g., income, education, housing tenure), but found little evidence of variation in social network characteristics between areas. This result therefore provides the empirical support of one case study (Hamilton) to the emerging hypothesis that community homogeneity and placed-based interaction are more important to the creation of social capital than overall income and education levels (Talen, 1999; Muntaner, Lynch, and Oates, 1999; Ife, 1995). In this context, the lack of variation in social capital and indeed in environmental concern and action by area is *not* evidence that "place doesn't matter"; instead, it shows that variations in environmental action cannot be accounted for solely in terms of individual characteristics. This further highlights a need to revisit the neighbourhood and neighbouring literatures, in order to help tease out the relationships between social context, local networks, and civic participation

Overall, this research contributes to academic scholarship by advancing our understanding of the relationship between environmental risk perception, concern, and action vis-a-vis ambient, ongoing environmental contamination. It has generated much needed knowledge about the influences of community context on collective action by identifying the role of different factors, particularly social capital, in influencing predisposition and capacity to take action around chronic environmental

exposure. In so doing, it provides a better understanding of the larger relationships between social capital, civic action, and health.

5.4 POLICY IMPLICATIONS

This research has a number of implications for policy development. First, it provides much-needed data on environmental exposure, local environmental action, and social network development in Hamilton. Once this data is disseminated to interested parties[3], it could be used to inform policy-making in environmental health at the municipal and health region levels. For example, data on environmental exposures and concerns could assist in determining resource allocation for environmental health interventions, and guide the development of risk education programs related to the issues raised. In addition, the information on participation rates in environmental action, and the determinants of these actions, could also be used by municipalities to help structure municipal programs. For example, Hamilton's new waste management strategy will require a 90% participation rate in recycling (City of Hamilton, 2001): this research could give decision-makers an idea of how realistic that goal is (i.e., 90% seems achievable based on this data), and could inform the development of strategies designed to increase participation (such

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[3] Once the dissertation is completed, executive summaries of the thesis material will be provided to the Hamilton Public Health Department and Clean Air Hamilton, as well as to members of the organizations who participated in the in-depth interviews. Chapter 2 has already been disseminated to a wide range of stakeholders through inclusion in Upwind Downwind (an international air quality conference held in Hamilton February 25 -26th, 2002) conference proceedings.

as the development of programs to facilitate recycling in multi-family dwellings). The results of this dissertation may also enable community leaders to more effectively encourage local action around poor air quality and other local environmental issues, by designing programs which address specific determinants of the actions of interest to them (e.g., focussing programs on non-English-speakers, who tend to be less involved in environmental action).

More generally, this research points to the importance of creating interventions which, either singly or in tandem, address factors related to all aspects of the conceptual framework developed here. Some researchers have recognised the limitations associated with the use of single-variable strategies to encourage behaviour change (e.g, Stern, 2000): this research provides a framework which can guide the development of intervention strategies to address the complex of factors which facilitate or inhibit environmental action.

As well, this research highlights the need for environmental health (and other) policy which is sensitive to local differences. It shows the importance of both environmental and social contexts in predicting different types of environmental action. It also underscores the importance of local data collection to policy development. This research shows that people will react differently to issues in differing environmental and social contexts, and that individual socio-demographic variations figure little in the development of these reactions. The assertion of MacIntyre et al. (1993) that places, as well as people, provide opportunities for useful intervention is therefore borne out by this research.

This research also shows that, while differences in exposure to environmental problems are important, environmental concern is not only the result of exposure, but also of social processes operating more generally in the community. In the case of air pollution, for example, concern was not limited to the areas which perceived greater exposure. Rather, air pollution concern was widespread throughout the study area, potentially because of the attention this issue has received locally from government and in the media. In any case, this finding is important to local policy-makers because it illustrates the importance of air quality problems to *all* residents of Hamilton, which in turn suggests that air pollution related interventions would garner widespread support, even if their effects were felt most in the areas with greatest exposure. It also suggests that the scale at which an environmental exposure is perceived (locally versus regionally, for example) is important to the development of public concern. This finding also may resonate with decision-makers in other jurisdictions, who are faced with making decisions in relation to environmental issues of regional (and even national) significance.

The finding that social capital is important in facilitating civic action also has relevance for policy decisions in this and other jurisdictions, and in particular for initiatives to develop civic action and involvement around (environmental health) issues. Recent literature has focussed on developing "capacity for advocacy" (Nathan et al, 2002) as a means of promoting health and environmental equity. This builds on previous calls for the development of organizational capacity to address health issues (e.g, Elliott et al, 1998), and the deployment of human and social capital

in developing countries for sustainable environmental management (e.g, World Bank, 1997; Al-Jayyousi, 2001). This research suggests that interventions aimed at increasing social networks and other forms of capacity have the potential to effectively increase environmental action.

In particular, this research suggests that particular forms of capacity-building may be particularly effective in facilitating certain types of environmental action. First, it is important to note that results from both the qualitative and quantitative components of this research indicate that participation in a given environmental action type is inversely related to the level of interpersonal engagement that action provides. While participation may be influenced by amount of time and energy required to undertake that action, this is not the only factor of relevance, since certain civic actions may require little time or resources (e.g. phoning an MPP or signing a petition), and certain behavioural modifications may have considerable costs in both money and time (e.g. purchasing and installing an air filter). This research suggests that issues related to capacity (for example, access to community networks) may help explain the differing levels of action observed. In this context, interventions which engage local citizens, and provide them with mechanisms to connect with each other (e.g., public meetings and even block parties) may be more effective in encouraging environmental action than broad, generalised environmental education programs. This conclusion parallels other recent research which suggests that interventions to encourage environmental action should aim at the social rather than the individual level (Steinheider, 1999).

The perceptions of the poor efficacy of civic actions reported in the in-depth interviews highlight also the potential of capacity-building efforts in the environmental health arena. Other research has suggested that current environmental education programs, which emphasize individual responsibility and altruism in relation to environmental action, create a "corrosive sense of helplessness" which actually diminishes enthusiasm for action (Kaplan, 2000, 491). Instead, initiatives which aim to connect with local social networks in order to provide the information and skills necessary for civic action may be more effective in facilitating action. In addition, issues related to the perceived ineffectiveness of participation in making change must be addressed in order to increase public involvement. That is, legitimate concerns about the effectiveness of civic action must be addressed if widespread action of this type is to be encouraged. This suggests the need for a different kind of capacity building: policy organizations need to ensure that proper structures exist within their organizations to effectively integrate, facilitate, and *respond to* citizen participation.

Finally, the finding that the area in which a person lives has little influence over the development of their social networks and social capital also has implications for initiatives designed to increase community capacity for environmental action. First, it serves as a useful caution to theorists and policy-makers, who tend to imply that socio-economically disadvantaged communities are somehow lacking in relation to social capital (Forrest and Kearns, 2001; Catell, 2001). Second, this finding points

once again to the importance of interventions which build on *existing* placed-based interactions to facilitate further social capital development and environmental action.

5.5 FUTURE RESEARCH DIRECTIONS

A number of specific areas which merit future research were identified in the substantive chapters of this thesis. Many of these suggestions focus on elaborating in greater detail the links between place, individual, social capital, and action. This is particularly important given that, while environmental exposures and socio-demographic characteristics thought to be relevant to action (e.g., age, income, education - Walsh, Warland and Smith, 1993) vary by area, observed levels of social capital and action do not. Further research is needed to determine how place may serve to moderate expected differences in this regard. Specifically, is the lack of variation the result of a balance between predisposition and capacity factors in each area? Or is our understanding of environmental action as rooted in individual characteristics fundamentally flawed? These questions require further research.

In addition, further investigation of the *scales* at which community issues may be viewed and acted on is necessary to better understand environmental action, as this cross-sectional research can only provide a necessarily partial view of the interactions that occur between people at a specific scale of analysis. Furthermore, the impact of the characteristics of places (e.g., the number and quality of local parks and recreational facilities) on the development of social ties and environmental action

requires further investigation. The use of methods which can incorporate a sensitivity to issues of context and scale, such as multi-level modelling (Duncan et al, 1998), should be considered in this context.

Additional research is also needed to develop a nuanced, empirically valid conception of social capital, and to continue to tease out the relationships between different facets of social capital (e.g., formal group involvement versus social trust) and civic action. In addition, longitudinal studies of environmental action, focussing on individuals who change their behaviour over time, would help to increase our understanding of the factors which encourage individuals to "make the jump" from actions like recycling to active participation in environmental and other civic action groups.

Overall, this research consisted of an investigation of a specific form of socially motivated behaviour (environmental action) in the context of one particular exposure (air pollution) in one particular place (Hamilton, Ontario, Canada). The conceptual framework developed in this research, however, could be used to frame investigations of other types of exposures (environmental and otherwise), other kinds of socially motivated behaviours (e.g., action around health care provision), in other contexts (e.g., extremely marginalized communities, workplaces, other cultures). This framework, then, could provide the foundation for much needed research which goes far beyond the environmentalist focus of this particular research program.

Continued research in this area is central to advancing our understanding of civic action in relation to environmental, health, and other issues. Increasing our

understanding in this area is vitally important, as many jurisdictions come to rely on voluntary participation to guide decision-making and manage public-sector initiatives. This is particularly of importance in the context of ongoing government retrenchment with respect to environmental and health service provision. In this situation, knowing what facilitates and what frustrates local action may help to protect environments and enhance communities.

5.6 REFERENCES

Al-Jayyousi, O. 2001. Capacity building for desalination in Jordan: necessary conditions for sustainable water management. *Desalination*, 141 (2): 169-179.

Arnstein, S. 1969. A ladder of citizen participation, *Journal of the American Planning Association,* 35: 216 - 224.

Baum, A. 1995. Researching public health: behind the qualitative-quantitative methodological debate. *Social Science and Medicine* 40 (4): 459-468.

Baxter, J. and J. Eyles. 1997. Evaluating qualitative research in social geography: establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers* 22 (4): 505-525.

Blake DE, 2001, Contextual effects of environmental attitudes and behavior. Environment and Behavior 33 708-725

Brewer, J. and Hunter, A. 1989. *Multi-method Research: a Synthesis of Styles.* Newbury Park, CA: Sage.

Brown, M.P. 1997. *RePlacing Citizenship: Aids Activism and Radical Democracy.* New York: Guilford Press.

Cattell, Vicky. 2001. Poor people, poor places, and poor health: the mediating role of social networks and social capital. *Social Science and Medicine*, 52: 1501 - 1516.

City of Hamilton. 2001. *Solid Waste Management Master Plan.* Available Online at: http://www.city.hamilton.on.ca/citydepartments/toe/wm/image/PDF/ TOE_master_plan_2001.pdf

Creswell, J. 1994. *Research Design: Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage.

Duncan, C., Jones, K., and Moon, G. 1998. "Context, composition and heterogeneity: using multi-level modelling in health research" *Social Science and Medicine*, 46 (1): 97 - 117.

Eisner, Elliott W. 1981. On the difference between scientific and artistic approaches to qualitative research. *Educational Researcher* (April): 5 - 9.

Elliott, S.J. 1999. Qualitative approaches in health geography: Introduction, *Professional Geographer*, 51 (2), 230 - 232.

Elliott, S.J. 1998. A comparative analysis of public concern over solid waste incinerators, *Waste Management Research*, 16 (4): 351-364.

Elliott, S.J., Taylor, S.M., Cameron, R., and Schabas, R. 1998. Assessing public health capacity to support community-based heart health promotion: the Canadian Heart Health Initiative - Ontario Project (CHHIOP). *Health Education Research*, 13 (4): 607 - 662.

Elliott, S.J., Taylor, S.M., Eyles, J.D., et al. 1993. Modelling psychosocial effects of exposure to solid waste facilities. Social Science and Medicine 37 (6): 791 - 804.

Engel, Uwe, and Potschke, Manuela. 1998. Willingness to pay for the environment: social structure, value orientation, and environmental behaviour in a multi-level perspective. *Innovation*, 11 (3): 315 - 332.

Eyles, J. 1998. Interpretive Approaches in Health Research, in Elliott, S.J. (ed), *Qualitative Analysis in Process Evaluation for Heart Health Promotion.* Conference Proceedings. February 25-27. (Population Health Fund, Health Canada).

Fine, B. 1999. The developmental state is dead - long live social capital? *Development and Change*, 30: 1 - 19.

Foley, M.W and Edwards, B. 1999. Is it time to disinvest in social capital? *Journal of Public Policy*, 19 (2): 141 - 173.

Forbes, A., and Wainright, S.P. 2001. On the methodological, theoretical and philosophical context of health inequalities research: a critique. Social *Science and Medicine*, 53 (6): 801 - 816.

Forrest, R. and Kearns, A. 2001. Social cohesion, social capital and the neighbourhood. *Urban Studies*, 38 (12): 2125 - 2143.

Graham, Elspeth. 1999. Breaking out: Opportunities and challenges of multi-method research. *Professional Geographer* 51 (1): 76 - 89.

Greenberg, M.R., and Schneider, D. 1996. *Environmentally Devastated Neighborhoods* New Brunswick, NJ, Rutgers University Press.

Greene, J.C., Caracelli, V.J., and Graham, W.F. 1989. Towards a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis,* 11: 255-274.

Ife, J. 1995. *Community Development.* Melbourne: Longman.

Luginaah, I.N., Taylor, S.M., Elliott, S.J., & Eyles, J.D. 2000. A longitudinal study of the health impacts of a petroleum refinery. *Social Science and Medicine,* 50: 1155-1166.

Langton, S. (ed.) 1978. *Citizen Participation in America.* Lexington, Mass.: D.C. Health.

Kaplan, S. 2000. Human Nature and Environmentally Responsible Behavior. *Journal of Social Issues*, 56 (3): 491-508.

Mason, J. 1994. 'Linking qualitative and quantitative data analysis', in Bryman, A. and Burgess, R.G. (eds), *Analyzing Qualitative Data,* London: Routledge, pp. 89-110.

MacIntyre, S., McIver, S., & Sooman, A. 1993. Area, class and health: should we be looking at places or people? *Journal of Social Policy,* 22; 213-234.

Mohan, Giles and Stokke, Kristian. 2000. Participatory development and empowerment: the dangers of localism. *Third World Quarterly*, 21 (2): 247 - 268.

Muntaner, Carles, John Lynch, and Gary Oates. 1999. The Social Class Determinants of Income Inequality and Social Cohesion Part II:

Presentation of an Alternative Model. *International Journal of Health Services* 29: 715-732.

Nathan, S., Rotem, A., and Ritchie, J. 2002. Closing the gap: building the capacity of non-governmental organizations as advocates for health equity. *Health Promotion International*, 17 (1): 69 - 78.

Quinn-Patton, Michael (1990) *Qualitative Evaluation Methods* (2nd ed.), Bevery Hills: Sage.

Popay, Jennie. 2000. Social capital: the role of narrative and historical research. *Journal of Epidemiology and Community Health*, 54: 401.

Putnam, R. 1993. *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton, NJ: Princeton U.P.

Steinheider, B., Fay, D., Hilburger, T., Hust, I., Prinz, L., Vogelgesang, F., and Hormuth, S.E. 1999. Social Norms as Predictors of Environmental Behavior. *Zeitschrift fur Sozial Psychologie*, 30 (1): 40 - 56.

Stern, Paul C. 2000. Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56 (3): 407 - 424.

Strauss, A. and J. Corbin. 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques,* Newbury Park: Sage.

Talen, E. 1999. Sense of community and neighbourhood form: an assessment of the social doctrine of new urbanism. *Urban Studies,* 36: 1361-1379.

Uyeki, Eugene S. 1999. Environmental beliefs, intended action, and behavior. *American Sociological Association (ASA)*, Association Paper.

Walsh, E., Warland, R., and Smith, D.C. 1993. Backyards, NIMBYs and incinerator sitings: implications for social movement theory. *Social Problems* 40 (1): 25-38.

Winchester, Hillary P.M. (1999) Interviews and questionnaires as mixed methods, *Professional Geographer*, 51 (1): 60-67.

World Bank. 1997. *World Development Report: The State in a Changing World.* Oxford: World Bank/Oxford University Press

Zelezny, L.C., and Shultz, P.W. 2000. Promoting Environmentalism. *Journal of Social Issues*, 56 (3): 365 - 371.

APPENDIX A

In-Depth Interview Checklist

Basic Interview Schedule/Checklist

Topic/Rationale	Questions	Probes
1. Community Context/ Social Network	How would you describe the area that you live in?	
	What are the things you like most/least about your neighbourhood/ community?	- Q of L - work - services - "community" - "environment"
	How well do you know your neighbours? How well do you get along?	- positive things?
	How *involved* are you in your community?	- member of groups? - kids?
2. Awareness	How *aware* are you of air quality/pollution?	- triggers? - "moments"?
3. Concerns/ Coping	How concerned are you about air pollution/air quality? why/not? how?	- high priority?
	What are your *concerns*?	- concerns related to health?
6. Knowledge and Information Sources	How much do you *know* about air pollution?	- reasons?
	How do you get *information* about air pollution?	- are there sources that you don't use that others do?
	Do you *trust* these sources of info?	- fair/balanced? - accurate?

	How could your sources of information have been improved?	- get enough information about air pollution? - what kind of information would you like to see (that you don't get currently)?
5. Perception of other actors (responsibility)	Who is responsible for "taking care" of air pollution?	- why?
	Who is "doing their share"?	- how? why/not?
	Who else is *involved*? What sorts of *roles* have they played?	- MOEE, Region, companies, NGOs - helpful/ unhelpful
	Who do you *trust*?	- why?
7. Feelings/Self-reported Effects	How does air quality/ pollution *affect* you?	- emotionally? - physically? - family? - friends?
8. Action	What do you *do*/ what have you done about air pollution?	- altered behaviour? (stayed inside, etc.) - thought about moving? - phoned? joined group? - why/not?
	What would make (have made) you take action?	- what motivates you? - what keeps you from getting (more) involved?
	What were the *consequences* of your action(s)?	- what happened?
8. Closing Remarks	Is there anything you'd like to add, or something that I haven't brought up that you think is important?	

APPENDIX B

Survey Instrument

```
==========================================================
HAMILTON ENVIRONMENTAL RISK AND ACTION SURVEY (HERAS)
project p873     ***v5***              10DEC99
==========================================================

>gend< [return][open cb][allow 1][loc 26/1]
     [setkey <f3> to <skcb>]
     [setkey <f7> to <j>]
[bold][yellow]
   INTERVIEWER:  Record respondent gender
[n][white]
        <1> male
        <5> female

        <8> don't know
    ====>

>ssss< [if BTIM is <>][settime BTIM][endif]
     [open cb]

>addR< [allow 35][inputloc 1/33] [# street address from setup case line]
>CITY< [allow 12][inputloc 1/68] [# city from sample]
>PSTL< [allow 7][inputloc 2/58]  [# postal code from sample]
>UIN<  [allow 4][inputloc 1/28]  [# unique identifier number from sample]

>size< [# household size including children]
     [r] Could you please tell me how many people, INCLUDING YOURSELF,
[n]
     [r] other adults, adult children, and children under the age of 18 [n]
     [r] years, live at this address altogether?                  [n]
[bold][yellow]
   INTERVIEWER:  Adults includes both relatives and non-relatives,
              such as boarders.
[n][white]
        <1> one person only

      <2-96> enter number of people

        <97> 97 or more people

        <98> don't know        <99> Refused
    ====>
```

[# check for correct street address]
>adrs< [r] Do you still live at: [n]
[r] [fill addR]? [n]

<1> yes [goto a1]
<5> no

<8> don't know <9> refused
====>

[#code wrong address as ineligible and exit]
>xxxx< [store <44> in CODE]
[store <44> in FNL]
[goto MOD7]

[#SECTION A: SOCIAL AND COMMUNITY NETWORKS]
>a1< [r] How long have you lived in your neighbourhood? [n]

<0> less than one year
<1-96> specify number of years 1 to 96
<97> 97 years or more

<98> don't know <99> refused
====>

>a2a< [r] What do you like MOST about your neighbourhood? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter first mention (specify) [specify][goto a2b]

<96> no first mention / nothing

<98> don't know <99> refused
====> [goto a3a]

>a2b< [r] Is there anything else you like about your neighbourhood? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter second mention (specify) [specify][goto a2c]

<96> no second mention

<98> don't know <99> refused
====> [goto a3a]

>a2c< [r] Is there anything else you like about your neighbourhood? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter third mention (specify) [specify]

<96> no third mention

<98> don't know <99> refused
====>

>a3a< [r] What do you DISLIKE MOST about your neighbourhood? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter first mention (specify) [specify][goto a3b]

<96> no first mention / nothing

<98> don't know <99> refused
====> [goto a4]

>a3b< [r] Is there anything else you dislike about your neighbourhood? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter second mention (specify) [specify][goto a3c]

<96> no second mention

<98> don't know <99> refused
====> [goto a4]

>a3c< [r] Is there anything else you dislike about your neighbourhood? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]

<1> enter third mention (specify) [specify]

<96> no third mention

<98> don't know <99> refused
====>

>a4<

[r] In general, would you describe the people in your neighbourhood as very [n]
[r] friendly, somewhat friendly, not very friendly, or not at all friendly? [n]

<1> very friendly
<3> somewhat friendly
<5> not very friendly
<7> not at all friendly

<8> don't know <9> refused
====>

>a5< [r] How often do you talk to your neighbours? [n]
[r] Would you say never, once or twice a year, once or twice a month, [n]
[r] once or twice a week, or more than twice a week? [n]
[bold][yellow]
INTERVIEWER: "talk" includes the occassional "Hi" as well as
more indepth conversations.
[n][white]
<1> never/don't know neighbours [goto a7]
<2> once or twice a year,
<3> once or twice a month,
<4> once or twice a week
<5> more than twice a week

<8> don't know <9> refused
====>

>a6< [r] How often do you help a neighbour or ask for help from a [n]
[r] neighbour? Would you say never, once or twice a year, once or [n]
[r] twice a month, once or twice a week, or more than twice a week? [n]
[bold][yellow]
INTERVIEWER: helping a neighbour or asking for help includes
things like borrowing tools or food, watching
each other's homes or children while away, or

helping each other with home repairs, etc.
[n][white]
<1> never/don't know neighbours
<2> once or twice a year,
<3> once or twice a month,
<4> once or twice a week
<5> more than twice a week

<8> don't know <9> refused
====>

>a7< [r] About how many volunteer organizations or clubs do you [n]
[r] belong to? Examples include children's groups, like the Girl [n]
[r] Guides, social service clubs, like the Kinsmen, sports teams, [n]
[r] a church, or environmental group. [n]

<1-96> specify number of groups
<97> 97 or more groups

<0> none [goto a9a]

<98> don't know [goto a9a] <99> refused [goto a9a]
====>

>a8a< [r] How involved are you in the activities and affairs of the groups [n]
[r] you belong to? Would you say very involved, somewhat involved, [n]
[r] not very involved, or not at all involved? [n]
[bold][yellow]
INTERVIEWER: Involvement means attending meetings and participating in activities, etc.
[n][white]
<1> very involved
<3> somewhat involved
<5> not very involved
<7> not at all involved

<8> don't know <9> refused
====>

>a8b< [r] Do any of these groups have environmental issues [n]
[r] as their main concern? [n]

<1> yes
<5> no

<8> don't know <9> refused
====>

>a9a< [#pretest, keep as is]
[r] Have you ever attended meetings of the city council or school board?[n]

<1> yes [goto a9b]
<5> no

<8> don't know <9> refused [goto a9b]
====>[goto a9a1]

>a9a1<

[r] Is this something you might ever do? [n]
[cyan]
Attend meetings of the city council or school board?
[n][white]
<1> yes, might ever do
<5> no, would never do

<8> don't know <9> refused
====>

>a9b< [#pretest]

[r] Have you ever voted in a national, provincial, or local election? [n]

<1> yes [goto a9c]
<5> no

<8> don't know <9> refused [goto a9c]
====>[goto a9b1]

>a9b1< [r] Is this something you might ever do? [n]
[cyan]
Vote in a national, provincial, or local election?
[n][white]
<1> yes, might ever do
<5> no, would never do

<8> don't know <9> refused
====>

>a9c< [#pretest]
[r] Have you ever signed a petition? [n]
<1> yes [goto a9d]
<5> no

<8> don't know <9> refused [goto a9d]
====>[goto a9c1]

>a9c1< [r] Is this something you might ever do? [n]
[cyan]
Sign a petition?
[n][white]
<1> yes, might ever do
<5> no, would never do

<8> don't know <9> refused
====>

>a9d< [#pretest]

[r] Have you ever joined in boycotts or protests? [n]
[bold][yellow]
INTERVIEWER: "boycott" means refusing to buy a product or service.
[n][white]
<1> yes [goto b1a]
<5> no

<8> don't know <9> refused [goto b1a]
====>[goto a9d1]

>a9d1<

[r] Is this something you might ever do? [n]
[cyan]
Join in a boycott or protest?
[white]
<1> yes, might ever do
<5> no, would never do

<8> don't know <9> refused

====>

[#SECTION B: SPECIFIC ENVIRONMENTAL CONCERN]
>b1a< [r] The next few questions are about environmental issues in the [n]
[r] Hamilton-Wentworth Region. First, can you please tell me what [n]
[r] local environmental issue is of the MOST concern to you? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter first mention (specify) [specify]

<96> no first mention / nothing [goto air]

<97> air pollution

<98> don't know [goto air] <99> refused [goto air]
====>

>b1b< [r] Are there any other local environmental issues of concern to you? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter second mention (specify) [specify]

<96> no second mention [goto b3]

<97> air pollution

<98> don't know [goto b3] <99> refused [goto b3]
====>

>b1c< [r] Are there any other local environmental issues of concern to you? [n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY
[n][white]
<1> enter third mention (specify) [specify]

<96> no third mention

<97> air pollution

<98> don't know <99> refused
====>

```
>b3< [#keep]
   [r] How certain are you that your environmental concerns are being or [n]
   [r] will be addressed?  Would you say very certain, fairly certain,   [n]
   [r] not very certain, or not at all certain?                          [n]

       <1> very certain
       <3> fairly certain
       <5> not very certain
       <7> not at all certain [goto air]

       <8> don't know [goto air] <9> refused [goto air]
   ====>

>b4a< [#keep]
    [r] Who is addressing or who do you think will address your concerns?[n]
[bold][yellow]
   INTERVIEWER:  ENTER ONE MENTION ONLY
[n][white]
       <1>  enter first mention (specify) [specify]

      <96>  no first mention / nothing [goto air]

       <98> don't know [goto air]    <99> refused [goto air]
   ====>

>b4b< [#dropped]
>b4c< [#dropped]

[#air pollution flag]
>air< [allow 1][store <0> in air]
[if b1a eq <97>][add <1> to air][endif]
[if b1b eq <97>][add <1> to air][endif]
[if b1c eq <97>][add <1> to air][endif]

>b5UT< [allow 1][#b5 UTMOST counter]

>b5a< [#dropped]
>b5b< [#dropped]
>b5c< [#dropped]
>b5d< [#dropped]
>b6a< [#dropped]
>b6b< [#dropped]
```

[#SECTION C: AIR POLLUTION AWARENESS, CONCERN AND EFFECTS ON DAILY LIFE]
[#if respondent DID NOT mention air pollution as a concern in Section B, ask c1a; otherwise, skip to c1b]
>c1a< [#keep]
[if air gt <0>][goto c1b][endif][#skip if air already mentioned]
[r] Some people who we talked to mentioned air pollution as an [n]
[r] environmental problem in Hamilton-Wentworth. Are you concerned [n]
[r] about air pollution in Hamilton-Wentworth? [n]
[bold][yellow]
INTERVIEWER: "air pollution" refers to odours, visible pollution, and soot/fallout.
[n][white]
<1> yes
<5> no

<8> don't know <9> refused
====>

>c1b< [r] Over the past summer did you notice any air pollution in YOUR [n]
[r] neighbourhood? [n]
[bold][yellow]
INTERVIEWER: "air pollution" refers to odours, visible pollution, and soot/fallout.
[n][white]
<1> yes
<5> no [goto gwh0]

<8> don't know [goto gwh0] <9> refused [goto gwh0]
====>

>c1c2< [#dropped]

>c1c3< [#dropped]

>c1d< [r] Over the past summer, did you notice air pollution in your [n]
[r] neighbourhood every day, several times a week, about once a [n]
[r] week, about once a month, or less than once a month? [n]

<1> every day
<2> several times a week
<3> about once a week
<4> about once a month

<5> less than once a month

<8> don't know [goto c4] <9> refused [goto c4]
====>

>c2< [r] When you noticed air pollution, did it BOTHER you every time, [n]
[r] almost every time, more than half the time, less than half the [n]
[r] time, or never? [n]

<1> every time
<2> almost every time
<3> more than half the time
<4> less than half the time
<5> never bothered [goto c4]

<8> don't know [goto c4] <9> refused [goto c4]
====>

>c3< [r] Did air pollution bother you a great deal, somewhat, only a [n]
[r] little, or not at all? [n]

<1> a great deal
<3> somewhat
<5> only a little
<7> not at all

<8> don't know <9> refused
====>

>c1c1< [r] How do you know when the air quality in your neighbourhood is poor?[n]
[bold][yellow]
INTERVIEWER: ENTER ONE MENTION ONLY.
R can answer from their own experience or from
information from the Weather Channel, etc.
[n][white]
<1> enter first mention (specify) [specify]

<96> no first mention

<98> don't know <99> refused
====>

```
>c4< [r] In the last five years has air pollution in your neighbourhood [n]
   [r] gotten better, worse, or has it stayed about the same?        [n]

       <1> better
       <3> worse
       <5> about the same

       <7> have not lived in neighbourhood for 5 years

       <8> don't know    <9> refused
   ====>

>gwh0< [allow 60][#c6 fill]
     [if size eq <1>]
          [store <your health> in gwh0]
     [endif]
     [if size gt <1>]
          [store <your health, or the health of anyone in your household,> in
gwh0]
     [endif]


>c6< [#pretest]
   [r] How likely do you think it is that [n]
   [r] [fill gwh0] [n]
   [r] will be affected by air pollution?                    [n]
   [r] Do you think it is very likely, somewhat likely, somewhat  [n]
   [r] unlikely, or very unlikely?                           [n]

       <1> very likely
       <3> somewhat likely
       <5> somewhat unlikely
       <7> very unlikely

       <8> don't know    <9> refused
   ====>

[#fills for c7]
>gwh1< [allow 70]
     [if size eq <1>]
          [store <in any way?> in gwh1]
```

```
    [endif]
    [if size gt <1>]
        [store <or the daily lives of anyone in your household, in any way?> in
gwh1]
    [endif]
[#fills for c7a]
>gwh2< [allow 70]
    [if size eq <1>]
        [store <?> in gwh2]
    [endif]
    [if size gt <1>]
        [store <, or the daily lives of anyone in your household?> in gwh2]
    [endif]
[#fills for c8a,c9a]
>gwh3< [allow 70]
    [if size eq <1>]
        [store < in other ways?> in gwh3]
    [endif]
    [if size gt <1>]
        [store <, or the daily lives of anyone in your household, in other ways?>
in gwh3]
    [endif]

>c7< [r] Has air pollution in your neighbourhood affected your daily life, [n]
   [r] [fill gwh1] [n]

      <1> yes [goto c7a]
      <5> no

      <8> don't know          <9> refused
   ====> [goto d1a]


[#first problem]
>c7a< [r] How has air pollution in your neighbourhood MOST affected your [n]
    [r] daily life[fill gwh2] [n]
[bold][yellow]
   INTERVIEWER:  DO NOT READ LIST
[n][white]
      <1> allergies
      <2> asthma [goto c7b1]
      <3> breathing/respiratory problems (unspecified)
      <4> burning eyes
```

<5> cough
<6> emphysema/bronchitis [goto c7b1]
<7> fatigue
<8> future health impacts
<9> headaches
<10> sinus problems
<11> sore throats

<0> other (specify) [goto c7s]

<98> don't know [goto d1a] <99> refused [goto d1a]
====> [goto PRB1]

>c7s< [allow 40][#other specify only]
[bold][yellow]
INTERVIEWER: enter other mention. DO NOT use ///
[n][white]

| |
====>

>c7b< [#other specify only]
[r] Do you consider this problem to be health-related? [n]

<1> yes
<5> no

<8> don't know <9> refused
====> [goto PRB1]

>c7b1< [#asthma or emphysema/bronchitis only]
[r] Has this been diagnosed by a doctor? [n]

<1> yes
<5> no

<8> don't know <9> refused
====>

>PRB1< [allow 40][store <> in PRB1]
[if c7a eq <1>][store <allergies> in PRB1][endif]
[if c7a eq <2>][store <asthma> in PRB1][endif]
[if c7a eq <3>][store <breathing/respiratory problems> in PRB1][endif]

```
    [if c7a eq <4>][store <burning eyes>              in PRB1][endif]
    [if c7a eq <5>][store <cough>                    in PRB1][endif]
    [if c7a eq <6>][store <emphysema/bronchitis>       in PRB1][endif]
    [if c7a eq <7>][store <fatigue>                  in PRB1][endif]
    [if c7a eq <8>][store <future health impacts>      in PRB1][endif]
    [if c7a eq <9>][store <headaches>                in PRB1][endif]
    [if c7a eq <10>][store <sinus problems>            in PRB1][endif]
    [if c7a eq <11>][store <sore throats>            in PRB1][endif]
    [if c7a eq <0>][store c7s                      in PRB1][endif]

[#second problem]
>c8a< [r] Has air pollution in your neighbourhood affected your  [n]
    [r] daily life[fill gwh3] [n]
[bold][yellow]
   INTERVIEWER:  DO NOT READ LIST
[n][white]
       <1> allergies
       <2> asthma [goto c8b1]
       <3> breathing/respiratory problems (unspecified)
       <4> burning eyes
       <5> cough
       <6> emphysema/bronchitis [goto c8b1]
       <7> fatigue
       <8> future health impacts
       <9> headaches
      <10> sinus problems
      <11> sore throats

       <0> other (specify) [goto c8s]

      <96> no other ways [goto c7c] <98> don't know [goto c7c] <99> refused
[goto c7c][#goto details]
   =====> [goto PRB2]

>c8s< [allow 40][#other specify only]
[bold][yellow]
   INTERVIEWER:  enter other mention.  DO NOT use ///
[n][white]
      _____________________________________________
      |                          |
    ====>

>c8b< [#other specify only]
```

[r] Do you consider this problem to be health-related? [n]

<1> yes
<5> no

<8> don't know <9> refused
====> [goto PRB2]

>c8b1< [#asthma or emphysema/bronchitis only]
[r] Has this been diagnosed by a doctor? [n]

<1> yes
<5> no

<8> don't know <9> refused
====>

>PRB2< [allow 40][store <> in PRB2]
[if c8a eq <1>][store <allergies> in PRB2][endif]
[if c8a eq <2>][store <asthma> in PRB2][endif]
[if c8a eq <3>][store <breathing/respiratory problems> in PRB2][endif]
[if c8a eq <4>][store <burning eyes> in PRB2][endif]
[if c8a eq <5>][store <cough> in PRB2][endif]
[if c8a eq <6>][store <emphysema/bronchitis> in PRB2][endif]
[if c8a eq <7>][store <fatigue> in PRB2][endif]
[if c8a eq <8>][store <future health impacts> in PRB2][endif]
[if c8a eq <9>][store <headaches> in PRB2][endif]
[if c8a eq <10>][store <sinus problems> in PRB2][endif]
[if c8a eq <11>][store <sore throats> in PRB2][endif]
[if c8a eq <0>][store c8s in PRB2][endif]

[#third problem]
>c9a< [r] Are there any other ways air pollution in your neighbourhood has [n]
[r] affected your daily life[fill gwh2] [n]
[bold][yellow]
INTERVIEWER: DO NOT READ LIST
[n][white]
<1> allergies
<2> asthma
<3> breathing/respiratory problems (unspecified)
<4> burning eyes
<5> cough
<6> emphysema/bronchitis

<7> fatigue
<8> future health impacts
<9> headaches
<10> sinus problems
<11> sore throats

<0> other (specify) [specify]

<96> no other ways <98> don't know <99> refused
====>

[#details, problem1]
>c7c< [if size eq <1>][goto d1a][endif][#skip all details if 1 person hh]
[if c7a eq <0>][if c7b ne <1>][goto c8c][endif][endif][#skip to prob#2 details if other non-health]
[r] How many people in your household have been affected by [n]
[r] [fill PRB1]? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one [goto c8c][#skip to prob#2 details]

<98> don't know <99> refused
====>

>C7C< [allow 25][store <Are any of these people> in C7C]
[if c7c eq <1>][store <Is this person> in C7C][endif]

>c7d< [r] [fill C7C] under 18 years of age? [n]

<1> yes [goto c7e]
<5> no

<8> don't know <9> refused
====> [goto c7g]

>c7e< [if c7c eq <1>][goto c8c][endif][#skip to prob2 if only 1 person]
[r] How many people under 18 years of age have been affected by [n]
[r] [fill PRB1]? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
=====>

>c7g< [if c7c eq c7d][goto c8c][endif][#skip to #2 if only person is under 18]
[if c7c eq c7e][goto c8c][endif][#skip to #2 if ALL are under 18]

[r] [fill C7C] affected by [fill PRB1] over 64 years old? [n]

<1> yes [goto c7h]
<5> no

<8> don't know <9> refused
=====> [goto c8c]

>c7h< [if c7c eq <1>][goto c8c][endif][#skip if only 1 person affected]
[r] How many people over 64 years of age have been affected by [n]
[r] [fill PRB1]? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

[#details, problem2]
>c8c< [if c8a gt <11>][goto d1a][endif][#skip if no 2nd problem]
[if c8a eq <0>][if c8b ne <1>][goto d1a][endif][endif][#skip if other non-health]
[r] How many people in your household have been affected by [n]
[r] [fill PRB2]? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one [goto d1a][#skip out]

<98> don't know <99> refused
====>

>C8C< [allow 25][store <Are any of these people> in C8C]
[if c8c eq <1>][store <Is this person> in C8C][endif]

>c8d< [r] [fill C8C] under 18 years of age? [n]

<1> yes [goto c8e]
<5> no

<8> don't know <9> refused
====> [goto c8g]

>c8e< [if c8c eq <1>][goto d1a][endif][#skip out if only 1 person]
[r] How many people under 18 years of age have been affected by [n]
[r] [fill PRB2]? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

>c8g< [if c8c eq c8d][goto d1a][endif][#skip out if only person is under 18]
[if c8c eq c8e][goto d1a][endif][#skip out if ALL are under 18]

[r] [fill C8C] affected by [fill PRB2] over 64 years old? [n]

<1> yes [goto c8h]
<5> no

<8> don't know <9> refused
====> [goto d1a]

>c8h< [if c8c eq <1>][goto d1a][endif][#skip if only 1 person affected]

[r] How many people over 64 years of age have been affected by [n]
[r] [fill PRB2]? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

[#SECTION D: ACTIONS RELATED TO ENVIRONMENTAL CONCERN]
>d1a< [r] Now, we'd like to ask you about some things you may have done to [n]
[r] try and help deal with local environmental issues. In the [n]
[r] last two years, have you done any of the following? [n]

[r] First, have you regularly sorted glass, cans, plastic, or paper [n]
[r] for recycling? [n]
[bold][yellow]
INTERVIEWER: this only refers to "at home".
[n][white]
<1> yes
<5> no

<8> don't know <9> refused
====>

>d1d< [#dropped]

>d1e< [r] In the last two years, have you refused to buy a product for [n]
[r] environmental reasons? [n]

<1> yes
<5> no

<8> don't know <9> refused
====>

>d1j< [cyan]In the last two years, have you [n][white]
[r] gone to a public meeting at which a local environmental issue [n]
[r] was discussed? [n]

```
      <1> yes
      <5> no

      <8> don't know          <9> refused
   ====>

>d2a< [#dropped]
>d2b< [#dropped]

>d2c< [cyan]In the last two years, have you [n][white]
    [r] donated money to a local environmental group or organization?  [n]

      <1> yes
      <5> no

      <8> don't know          <9> refused
   ====>

>d2d< [cyan]In the last two years, have you [n][white]
    [r] telephoned, written or spoken to government staff, politicians,    [n]
    [r] industry representatives, or the media about a local environmental [n]
    [r] issue?                                                             [n]

      <1> yes
      <5> no

      <8> don't know          <9> refused
   ====>

>d2h< [cyan]In the last two years, have you [n][white]
    [r] attended a public protest about a local environmental issue? [n]

      <1> yes
      <5> no

      <8> don't know          <9> refused
   ====>

[#SECTION J: GENERAL HEALTH STATUS (moved)]
[#fills for j3]
>gwh4< [allow 40]
    [if size eq <1>]
        [store <you> in gwh4]
```

```
    [endif]
    [if size gt <1>]
        [store <you, or other household members> in gwh4]
    [endif]
[#fills for allergies,asthma]
>gwh5< [allow 30]
    [if size eq <1>]
        [store <Do you> in gwh5]
    [endif]
    [if size gt <1>]
        [store <Does anyone in your household> in gwh5]
    [endif]

>j1< [r] Now, thinking about your health, in general, would you say your  [n]
   [r] health is excellent, very good, good, fair, or poor?          [n]

      <1> excellent
      <2> very good
      <3> good
      <4> fair
      <5> poor

      <8> don't know          <9> refused
   ====>

[#allergies]
>scrn< [r] Now I'd like to ask you a number of questions about long-term  [n]
    [r] health problems [fill gwh4] may have.                  [n]

      <1> to continue
   ====>

>j3< [if c7a eq <1>][goto j4][endif][#skip if c7a=allergies]
   [if c8a eq <1>][goto j4][endif][#skip if c8a=allergies]
   [r] [fill gwh5] have hay-fever or other allergies? [n]
[bold][yellow]
   INTERVIEWER:  if R had allergies earlier in the year but not now,
            still record this as "yes"
[n][white]
      <1> yes [goto j3b]
      <5> no

      <8> never been told/don't know        <9> refused
```

====> [goto j4][#skip to asthma]

>j3b< [if size eq <1>][goto j4][endif][#skip if 1 person hh]
[r] How many people in your household have been affected by [n]
[r] hay-fever or other allergies? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one [goto j4]

<98> don't know <99> refused
====>

>J3B< [allow 25][store <Are any of these people> in J3B]
[if j3b eq <1>][store <Is this person> in J3B][endif]

>j3c< [r] [fill J3B] under 18 years of age? [n]

<1> yes [goto j3d]
<5> no

<8> don't know <9> refused
====> [goto j3f]

>j3d< [if j3b eq <1>][goto j4][endif][#skip if only 1 person affected]
[r] How many people under 18 years of age have been affected by [n]
[r] hay-fever or other allergies? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

>j3f< [if j3b eq j3d][goto j4][endif][#skip if ALL are under 18]

[r] [fill J3B] with hay fever or other allergies over 64 years old? [n]

<1> yes [goto j3g]
<5> no

<8> don't know <9> refused
====> [goto j4]

>j3g< [if j3b eq <1>][goto j4][endif][#skip if only 1 person affected]
[r] How many people over 64 years of age have been affected by [n]
[r] hay-fever or other allergies? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

[# asthma]
>j4< [if c7a eq <2>][goto j5][endif][#skip if c7a=asthma]
[if c8a eq <2>][goto j5][endif][#skip if c8a=asthma]
[r][fill gwh5] currently have asthma diagnosed by a doctor?[n]

<1> yes [goto j4b]
<5> no

<8> don't know <9> refused
====> [goto j5][#skip to emphysema]

>j4b< [if size eq <1>][goto j5][endif][#skip if 1 person hh]
[r] How many people in your household have been affected by [n]
[r] asthma diagnosed by a doctor? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one [goto j5]

<98> don't know <99> refused
====>

>J4B< [allow 25][store <Are any of these people> in J4B]
[if j4b eq <1>][store <Is this person> in J4B][endif]

>j4c< [r] [fill J4B] under 18 years of age? [n]

<1> yes [goto j4d]
<5> no

<8> don't know <9> refused
====> [goto j4f]

>j4d< [if j4b eq <1>][goto j5][endif][#skip if only 1 person affected]
[r] How many people under 18 years of age have been affected by [n]
[r] asthma diagnosed by a doctor? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

>j4f< [if j4b eq j4d][goto j5][endif][#skip if ALL are under 18]

[r] [fill J4B] with asthma diagnosed by a doctor over 64 years old? [n]

<1> yes [goto j4g]
<5> no

<8> don't know <9> refused
====> [goto j5]

>j4g< [if j4b eq <1>][goto j5][endif][#skip if only 1 person affected]
[r] How many people over 64 years of age have been affected by [n]
[r] asthma diagnosed by a doctor? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

[#emphysema or chronic bronchitis]
>j5< [if c7a eq <6>][goto j6][endif][#skip if c7a=emphysema/bronchitis]
[if c8a eq <6>][goto j6][endif][#skip if c8a=emphysema/bronchitis]
[r] [fill gwh5] have emphysema or chronic bronchitis, [n]
[r] as diagnosed by a doctor? [n]

<1> yes [goto j5b]
<5> no

<8> never been told/don't know <9> refused
====> [goto j6][#skip to cough]

>j5b< [if size eq <1>][goto j6][endif][#skip if 1 person hh]
[r] How many people in your household have been affected by [n]
[r] emphysema or chronic bronchitis, as diagnosed by a doctor? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one [goto j6]

<98> don't know <99> refused
====>

>J5B< [allow 25][store <Are any of these people> in J5B]
[if j5b eq <1>][store <Is this person> in J5B][endif]

>j5c< [r] [fill J5B] under 18 years of age? [n]

<1> yes [goto j5d]
<5> no

<8> don't know <9> refused
====> [goto j5f]

>j5d< [if j5b eq <1>][goto j6][endif][#skip if only 1 person affected]

[r] How many people under 18 years of age have been affected by emphysema or [n]
[r] chronic bronchitis diagnosed by a doctor? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

>j5f< [if j5b eq j5d][goto j6][endif][#skip if ALL are under 18]

[r] [fill J5B] affected by emphysema or chronic bronchitis [n]
[r] over 64 years old? [n]

<1> yes [goto j5g]
<5> no

<8> don't know <9> refused
====> [goto j6]

>j5g< [if j5b eq <1>][goto j6][endif][#skip if only 1 person affected]

[r] How many people over 64 years of age have been affected by emphysema [n]
[r] or chronic bronchitis diagnosed by a doctor? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

[#cough]
>j6< [if c7a eq <5>][goto g8][endif][#skip if c7a=cough]
[if c8a eq <5>][goto g8][endif][#skip if c8a=cough]
[r] [fill gwh5] have a persistent cough? [n]

<1> yes [goto j6b]
<5> no

<8> never been told/don't know <9> refused
====> [goto g8][#skip to section G]

>j6b< [if size eq <1>][goto g8][endif][#skip if 1 person hh]
[r] How many people in your household have been affected by [n]
[r] a persistent cough? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one [goto g8]

<98> don't know <99> refused
====>

>J6B< [allow 25][store <Are any of these people> in J6B]
[if j6b eq <1>][store <Is this person> in J6B][endif]

>j6c< [r] [fill J6B] under 18 years of age? [n]

<1> yes [goto j6d]
<5> no

<8> don't know <9> refused
====> [goto j6f]

>j6d< [if j6b eq <1>][goto g8][endif][#skip if only 1 person affected]
[r] How many people under 18 years of age have been affected by [n]
[r] a persistent cough? [n]

<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

>j6f< [if j6b eq j6d][goto g8][endif][#skip if ALL are under 18]

[r] [fill J6B] with a persistent cough over 64 years old? [n]

<1> yes [goto j6g]
<5> no

<8> don't know <9> refused
====> [goto g8]

>j6g< [if j6b eq <1>][goto g8][endif][#skip if only 1 person affected]
[r] How many people over 64 years of age have been affected by [n]
[r] a persistent cough? [n]
<1-95> enter number of people

<96> 96 or more

<97> no one

<98> don't know <99> refused
====>

[#SECTION G: WORLDVIEW]
>g1a< [#dropped]
>g1b< [#dropped]
>g8< [#pretest]
[r] Now I'd like to ask you a few questions about your views in general. [n]

[r] First, how much do you trust the government to do what is right? [n]
[r] Do you trust it always, most of the time, only some of the time, [n]
[r] or almost never? [n]

<1> always
<3> most of the time
<5> only some of the time
<7> almost never

<8> don't know <9> refused
====>

>g7< [#pretest]
[r] Generally speaking, would you say that most people can be [n]
[r] trusted, or that you can't be too careful in dealing with people? [n]

<1> most people can be trusted
<5> can't be too careful

<8> don't know <9> refused
=====>

>g9a< [#pretest]

[r] Now I'd like to ask your OPINION about some hypothetical situations. [n]

[r] Please tell me for each situation whether you think it can always, [n]
[r] sometimes, or never be justified: [n]

[r] First, do you think claiming government benefits to which you are not [n]
[r] entitled can always, sometimes, or never be justified? [n]

<1> can always be justified
<3> can sometimes be justified
<5> can never be justified

<8> don't know <9> refused
====>

>g9b< [#dropped]

>g9c< [#pretest]
[r] Do you think cheating on your taxes if you get the chance can [n]
[r] always, sometimes, or never be justified? [n]

<1> can always be justified
<3> can sometimes be justified
<5> can never be justified

<8> don't know <9> refused
====>

>g9d< [#pretest]
[r] Do you think buying something you knew was stolen can always, [n]
[r] sometimes, or never be justified? [n]

<1> can always be justified

<3> can sometimes be justified
<5> can never be justified

<8> don't know <9> refused
====>

>g9e< [#pretest]

[r] What about failing to report damage that you have done accidentally to [n]
[r] a parked car? [n]
[cyan]
Can this always, sometimes, or never be justified?
[white]
<1> can always be justified
<3> can sometimes be justified
<5> can never be justified

<8> don't know <9> refused
====>

>g9f< [#dropped]

[#SECTION H: EMPOWERMENT]
>h1a< [#dropped]
>h1b< [#dropped]
>h1c< [#dropped]

>h2a< [#pretest]
[r] Next, we want to know how you feel about yourself these days. [n]

[r] I'm going to read you some statements. Please tell me whether you [n]
[r] strongly agree, somewhat agree, neither agree nor disagree, somewhat [n]
[r] disagree, or strongly disagree with the statement as it applies to [n]
[r] you. [n]

[r] First, I am a useful person to have around. [n]

[r] Do you strongly agree, somewhat agree, neither agree nor disagree, [n]
[r] somewhat disagree, or strongly disagree? [n]

<1> strongly agree
<2> somewhat agree
<3> neither agree nor disagree

<4> somewhat disagree
<5> strongly disagree

<8> don't know <9> refused
====>

>h2b< [#pretest]
[r] I feel I can't do anything right. [n]

[r] Do you strongly agree, somewhat agree, neither agree nor [n]
[r] disagree, somewhat disagree, or strongly disagree? [n]

<1> strongly agree
<2> somewhat agree
<3> neither agree nor disagree
<4> somewhat disagree
<5> strongly disagree

<8> don't know <9> refused
====>

>h2c< [#pretest]
[r] When I do a job, I do it well. [n]
[cyan]
Do you strongly agree, somewhat agree, neither agree nor
disagree, somewhat disagree, or strongly disagree?
[n][white]
<1> strongly agree
<2> somewhat agree
<3> neither agree nor disagree
<4> somewhat disagree
<5> strongly disagree

<8> don't know <9> refused
====>

>h2d< [#pretest]
[r] I feel that my life is not very useful. [n]
[cyan]
Do you strongly agree, somewhat agree, neither agree nor
disagree, somewhat disagree, or strongly disagree?
[n][white]
<1> strongly agree

<2> somewhat agree
<3> neither agree nor disagree
<4> somewhat disagree
<5> strongly disagree

<8> don't know <9> refused
====>

>a10< [#keep, cannot change; moved from section A]
[r] Is there someone in your family or a close friend that you can [n]
[r] confide in or talk to freely about your problems? [n]

<1> yes
<5> no

<8> don't know <9> refused
====>

>a11< [#keep; moved from section A]
[r] Is there someone among your friends or in your family who can [n]
[r] help you if you need it? [n]

<1> yes
<5> no

<8> don't know <9> refused
====>

[#SECTION SD: SOCIO-DEMOGRAPHIC QUESTIONS]
>sd1< [#intro now, year of birth moved to front of Q]
[# year of birtth relocated back nere by rm]
[r] Now I have a few final questions about your background. [n]

<1> to continue
====>

>rage< [#respondent age]
[r] First, in what year were you born? [n]
[bold][yellow]
INTERVIEWER: If asked, explain that some of the questions that
follow depend on the age of the respondent.
[n][white]
<1900-1982> enter year

<9998> don't know <9999> refused
====>

>rag2< [# dropped]

>rag3< [# dropped]

>sd2< [r] What is the highest level of education you have obtained? [n]

<0> no schooling
<1> some elementary school
<2> completed elementary school
<3> some high school/ junior high
<4> completed high school (NS&PQ'11, ONT'13 or 12, OTHERS'12)
<5> some community college
<6> completed community college
<7> some technical school (College Classique, CEGEP)
<8> completed technical school (College Classique, CEGEP)
<9> some university
<10> completed bachelor's degree (Arts, Science, Engineering, etc.)
<11> post graduate training: Master's of Arts, M. Sc., MLS, MSW, etc.
<12> post graduate training: PhD, doctorate
<13> professional degree (law, medicine, dentistry)

<98> don't know <99> refused
====>

>sd3< [r] At present are you married, living with a partner, widowed, [n]
[r] divorced, separated, or have you never been married? [n]

<1> married or living with a partner
<2> widowed
<3> divorced
<4> separated
<5> never married

<8> don't know <9> refused
====>

>sd4< [r] Are you presently working for pay in a full-time or in a part- [n]
[r] time job, are you unemployed, retired, a homemaker, a student [n]
[r] or something else? [n]

<1> full-time job, including during vacations from work
<2> part-time job
<3> sick leave, maternity leave, strike, etc.
<4> unemployed
<5> retired
<6> homemaker [goto sd9a]
<7> student (includes students working part-time)[goto sd9a]

<0> other (specify) [specify][goto sd9a]

<8> don't know [goto sd9a] <9> refused [goto sd9a]
====>

>SD5< [allow 60]
[store <What is your main occupation?> in SD5]
[if sd4 eq <5>]
[store <Before you retired, what was your occupation?> in SD5]
[endif]
[if sd4 eq <4>]
[store <When you were last employed, what was your occupation?> in SD5]
[endif]

>work< [allow 1][store <> in work][#currently employed flag]
[if sd4 eq <1>][store <1> in work][endif]
[if sd4 eq <2>][store <1> in work][endif]

>sd5a< [r][fill SD5][n]
[bold][yellow]
INTERVIEWER: If more than one job, ask about main job.

If not clear, probe with:
What do you do at work?
What exactly does the job entail?
What kind of industry do you work in?
[n][white]
<1> enter text, end with /// [specify]

<9> refused

====>

>sd5b< [if work ne <1>][goto sd9a][endif]
[r] Which of the following best describes the hours you usually work: [n]
[r] in the daytime, the afternoon or evening, the night shift, or on [n]
[r] a rotating shift? [n]
[bold][yellow]
INTERVIEWER: ASK ABOUT MAIN JOB
[n][white]
<1> daytime
<2> afternoons or evenings
<3> night shift
<4> rotating shift
<5> other (specify) [specify]

<8> don't know <9> refused
====>

>sd9a< [r] Could you please tell me how much income you and other members [n]
[r] of your household received in 1998? Be sure to include income [n]
[r] from all sources such as savings, pensions, rent, and [n]
[r] unemployment insurance as well as wages. [n]

[r] To the nearest thousand dollars, what was your total 1998 household [n]
[r] income before taxes and other deductions were made? [n]

<1-996> enter exact income in thousands [goto sd10]

<997> $996,000 or more [goto sd10]

<998> don't know <999> refused
====>

>sd9b< [r] We don't need the exact amount. Which of these broad categories [n]
[r] does your 1998 household income fall into...? [n]

<1> ...Less than $20,000
<2> ...$20,000 - $30,000 (29,999)
<3> ...$30,000 - $40,000 (39,999)
<4> ...$40,000 - $50,000 (49,999)
<5> ...$50,000 - $60,000 (59,999)
<6> ...$60,000 - $70,000 (69,999)

<7> ...$70,000 - $80,000 (79,999)
<8> ...$80,000 - $90,000 (89,999)
<9> ...$90,000 - $100,000 (99,999)
<10> ...or over $100,000

<98> don't know <99> refused
====>

>sd10< [#dropped]

>sd12< [r] Is your dwelling owned or being bought by you or a member of [n]
[r] this household, or do you rent it? [n]

<1> owned or being bought by member of household
<5> rented (even if no cash rent is paid)

<8> don't know <9> refused
====>

>sd13< [r] Is your dwelling part of a condominium or cooperative? [n]

<1> yes, part of a condominium or cooperative
<5> no

<8> don't know <9> refused
====>

>sd15< [r] Is your dwelling a single family detached, single family [n]
[r] attached, a duplex, triplex, or quad, an apartment building of [n]
[r] five stories or more, or some other type of dwelling? [n]

<1> single family detached
<2> single family attached (townhouse, semi)
<3> duplex, triplex, quad and apartments less than five storeys
<4> apartments five storeys or more
<5> other (specify) [specify]

<8> don't know <9> refused
====>

>sd18< [r] Were you born in Canada? [n]

<1> yes [goto sd21]

<5> no

<8> don't know [goto sd21] <9> refused [goto sd21]
====>

>sd19< [r] In what country were you born? [n]

<1> specify country [specify]

<8> don't know <9> refused
====>

>sd21< [r] What language do you speak most often at home? [n]

<1> English
<3> French

<5> other (specify) [specify]

<8> don't know <9> refused
====>

>sd22< [r] At the present time, do you smoke cigarettes daily, [n]
[r] occasionally, or not at all? [n]

<1> daily
<3> occasionally
<5> not at all

<8> don't know <9> refused
====>

>sd23< [r] Including yourself, how many people in your household smoke [n]
[r] tobacco regularly INSIDE the house? [n]
[bold][yellow]
INTERVIEWER: This includes everyone including babysitters, boarders, etc.
[n][white]
<0> nobody smokes inside
<1-96> enter number
<97> 96 or more

<98> don't know <99> refused

```
   ====>

[# HOUSEHOLD]
>n1a< [#1][if size eq <1>][goto stop][endif][#skip if 1 person hh]
    [r] In order to get a better picture of your household, we would    [n]
    [r] like to ask you a couple of questions about each person in your [n]
    [r] household. This information will allow us to compare different  [n]
    [r] types of households.                                            [n]

    [r] Starting with the oldest person in your household, REMEMBER TO  [n]
    [r] INCLUDE YOURSELF, what is their gender?                         [n]

       <1> male
       <5> female

       <8> don't know   <9> refused
   ====>

>n1b< [r] How old is that person? [n]
[bold][yellow]
   INTERVIEWER:  enter exact age
[n][white]
      <0-96> enter age
       <97> 97 or older

       <98> don't know   <99> refused
   ====>

>n2a< [#2]
    [r] Now for the second oldest person in your household, [n]
    [r] what is their gender?                               [n]

       <1> male
       <5> female

       <7> no one else in household [goto stop][#if size unknown]

       <8> don't know   <9> refused
   ====>

>n2b< [r] How old is that person? [n]
[bold][yellow]
   INTERVIEWER:  enter exact age
```

[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n3a< [#3][if size lt <3>][goto stop][endif]
[r] The third oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n3b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n4a< [#4][if size lt <4>][goto stop][endif]
[r] The fourth oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n4b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]

<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n5a< [#5][if size lt <5>][goto stop][endif]
[r] The fifth oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n5b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n6a< [#6][if size lt <6>][goto stop][endif]
[r] The sixth oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n6b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age

<97> 97 or older

<98> don't know <99> refused
====>

>n7a< [#7][if size lt <7>][goto stop][endif]
[r] The seventh oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n7b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n8a< [#8][if size lt <8>][goto stop][endif]
[r] The eighth oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n8b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n9a< [#9][if size lt <9>][goto stop][endif]
[r] The ninth oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n9b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused
====>

>n10a< [#10][if size lt <10>][goto stop][endif]
[r] The tenth oldest person, what is their gender? [n]

<1> male
<5> female

<7> no one else in household [goto stop]

<8> don't know <9> refused
====>

>n10b< [r] How old is that person? [n]
[bold][yellow]
INTERVIEWER: enter exact age
[n][white]
<0-96> enter age
<97> 97 or older

<98> don't know <99> refused

====>

>stop< [if ETIM eq <>][settime ETIM][endif][goto SET]