

The Mediating Effects of Social Capital and Social Support on the Income and Health
Relationship

by

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B.A., McMaster University, 2003

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ABSTRACT

Conceptualizations of social cohesion, social support, and social capital are often overlapping. This thesis aims to clarify and operationalize the term social cohesion, and empirically test the mediating effects of social cohesion on the income and health relationship. First, the inequality/social cohesion treatise postulated by Wilkinson (1996) is deconstructed and its limitations extrapolated. Second, relevant literature is drawn upon to create a social cohesion model that is inclusive of both social capital and social support variables. Third, multiple regression statistical analyses is performed using survey data administered to randomly selected middle-aged residents (N=918) of Victoria, British Columbia. It is argued that past research concerning social capital has been hastily conducted and erroneous conclusions have been drawn concerning social capital as a social determinant of health. This research vindicates the hypothesis that a critical re-examination of the social determinants of health literature is necessary.

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List of Acronyms

BC	British Columbia
CBSC	Community Behavioural Social Cohesion
CC	Chronic Conditions
CDR	Coronary Heart Disease Rates
CHLC	Chance Health Locus of Control
CIHR	Canadian Institute for Health Research
CPSC	Community Psychosocial Social Cohesion
Df	Degrees of Freedom
DV	Dependent Variable
EH	Emotional Health
GDP	Gross Domestic Product
GPH	General Perceived Health
IHLC	Internal Health Locus of Control
ISS	Perceived Instrumental Support Scale
IV	Independent Variable
MHLC	Multidimensional Health Locus of Control
MOS	Medical Outcomes Survey
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PATH	Promoting Action Towards Health
PESS	Perceived Emotional Support Scale
PF	Physical Functioning
PHLC	Powerful others Health Locus of Control
PSS	Perceived Stress Scale
RLEH	Role Limitations due to Emotional Health
RLPH	Role Limitations due to Physical Health
SES	Socioeconomic Status
SF-36	36-item Short Form
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

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Introduction

In the last hundred years, epidemiology¹ has moved beyond a purely biomedical understanding of illness and has begun to address the effects of social determinants on health. This epistemological shift created the term social epidemiology, which became pronounced in the sociology of medicine and health literatures during the later half of the 20th century (Young, 1998). The sociology of medicine tended to focus on institutional aspects of health and illness (e.g., health care system, bio-medical ideology); whereas, the sociology of health literature focussed on the individual aspects of health and illness (e.g., socio-demographic, socio-psychological, and environmental influences) (Clarke, 2000). This gave renewed emphasis to the study of health disparities between social groups, such as studies on the health difference across the socioeconomic continuum (Young, 1998). In 1980, the UK's Black Report was the first public document in Britain to state there was a class gradient that influenced mortality rates. This was a highly controversial finding, as policy makers and the public tended to view the lower classes as people deserving of their poor health outcomes because of their poor lifestyle choices (Townsend, Davidson & Whitehead, 1990). The Black Report played a substantial role in shifting the ideology in health from a 'blaming the victim' perspective towards one that also looked at the social causes of health inequalities. Whereas the Black Report determined class position by occupational status, now researchers prefer the more-inclusive term of socio-economic status (SES). SES, in addition to occupation, also

¹ Epidemiology is defined as "the study of the determinants, occurrence, and distribution of health and disease in a defined population" (Brachman, 1996: 1). This definition refers to the epistemological shift that occurred within epidemiology towards what is now commonly referred to in the literature as 'social epidemiology.' Social epidemiology puts the focus of study on the "social determinants of population distributions of health, disease, and wellbeing, rather than treating such determinants as mere background to biomedical phenomena" (Krieger, 2001: 693).

considers income and education levels when determining one's status in society (Pearce & Smith, 2003). For example, an individual is considered of low SES if s/he has low income and education levels, and a job as an unskilled labourer. There is a virtual consensus among researchers that those with low SES will have poor health (Evans, 1994).

In addition to the Black report, research from the Whitehall Study in the UK brought a whole new series of questions for the researcher regarding the impact low income has on health. The Whitehall Study determined that health status decreased the further down the SES continuum one was. Yet, it was not just those in abject poverty who suffered losses in life expectancy but also those located below the highest SES level. Following the Whitehall Study, the assumption by researchers (Angell, 1993; Wilkinson, 1996; Adler & Snibbe, 2003) was that individuals in developed countries have access to the basic necessities for good health, and therefore income must not have a direct influence on health (as in developing nations) but instead influenced health through indirect mechanisms.

One of these suggested indirect mechanisms explaining the health gradient includes the stress process. Conceptually, the stress process model posits that stressors impact the body through neuroendocrine pathways, and if one is under chronic stress this can impact the body negatively (Marmot & Wilkinson, 2001). It has been further suggested that where one is located in the SES continuum can determine how well one deals with the stressors in their life (Marmot & Wilkinson, 2001; Wilkinson & Marmot, 2003). For instance, in the Whitehall study, the presence of job stress (which was mediated by one's sense of control in the workplace) was found to have dramatic impacts

on coronary heart disease rates (CDR), which varied according to job classification. In other words, the lower the job classification the greater the job stress and feeling of lack of control in the workplace and subsequently the higher the CDR (Marmot, Kogevinas & Elston, 1987).

Another area of the health literature that considers the stress process is social support research. A number of studies have looked at the direct and mediating effects of social support on health, and have provided much evidence that the presence of social support is associated with higher life expectancies (Berkman, Glass, Brissette, & Seeman, 2000a). The most predominant types of social support that are studied in this context are: emotional (close friends and family to confide in); instrumental (people to rely on for practical purposes), and; membership in groups (e.g., usually church membership) (Berkman et al., 2000a). These types of social support have been used to examine the health gradient in further detail. When applying the stress process to the relationship between SES and health, social support tends to be examined in terms of being a mediator (Pearlin, 1989) that reduces the negative effect of acute or chronic stressors (e.g., low SES) on health (Stansfeld, 2002). In relation to the health gradient, social support is examined as to whether or not it reduces the negative effects that a lower income can have on health.

One of the predominant theorists in this area of health research is Richard G. Wilkinson (1996), who argues that people with higher incomes have greater levels of social cohesion, which in turn leads to healthier outcomes. Conversely, low-income earners who have low levels of social cohesion are unhealthier. This thesis will test Wilkinson's argument by empirically examining the extent to which various areas of

social cohesion (e.g., social capital and social support) mediate the relationship between income and health.

Wilkinson conceptualizes social cohesion as an integral part of an egalitarian society, which he describes as having the following attributes:

[Egalitarian societies] have a strong community life. Instead of social life stopping outside the front door, public space remains a social space. The individualism and the values of the market are restrained by a social morality. People are more likely to be involved in social and voluntary activities outside the home...There are fewer signs of anti-social aggressiveness, and society appears more caring. In short, the social fabric is in better condition (Wilkinson, 1996:4).

Wilkinson, like Emile Durkheim (1897) before him, believed that social cohesion was the glue that held society together and functioning efficiently, and is a reflection of the stasis of its citizens. According to Wilkinson (1996) and others (United Nations Development Programme, 2004), a well functioning society will have low health inequality (a life expectancy that is equal across the SES continuum) and low income inequality (a small gap between those with low income and high income). In addition, Wilkinson suggests that a society with high income inequality can create a tear in its social fabric and subsequently create an unequal distribution of life expectancy across the SES continuum.

This occurs due to one's perception of their place in the SES hierarchy. Poorer people become jealous of those who have more than them and thus a lack of trust between people is fostered, causing anti-social behaviour and thus a less socially cohesive society, which will produce poorer health status. Wilkinson (1996) characterizes these types of societies with high income inequality and low social cohesiveness as societies with low levels of social capital. He borrows his definition of social capital from Putnam (1995) who defines social capital as, "the features of social

organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit" (67). Wilkinson suggests that by using variables such as interpersonal trust and membership in formal groups and organizations, one can determine how socially cohesive a society is. Wilkinson believes that income inequality explains much more of the health gradient in Western societies than absolute income does.

This thesis addresses three main problems with Wilkinson's argument. First, it is primarily a theoretical argument that has little empirical evidence to support it. Second, social cohesion is represented using social capital variables and thus barely acknowledges the individual-level of social cohesion (e.g., social support) by focusing mainly on the community-level. Third, the measures used in Wilkinson's research tend to be limited and fail to examine other behavioural and psychosocial community factors that could contribute to social cohesion. Such examples would include neighbouring, sense of community, fear of crime, etc.

This thesis contributes empirical evidence to the theoretical debate surrounding social capital by using a multidimensional approach to analyse social cohesion as a mediator between the income and health relationship. To do this, Wilkinson's notion of social cohesion is extended in two ways. First, Wilkinson's definition of social cohesion is expanded to include four types of social cohesion (emotional support, instrumental support, community behavioural, and community psychosocial). Second, Wilkinson's conceptualization of community-level social cohesion is expanded from the sole use of social capital measures to include more behavioural and psychosocial measures. This allows for the contextual environment in which the individual is embedded to be taken

into account (Corin, 1994). This is of paramount importance, since Wilkinson's (1996) claims have influenced policy makers of industrial nations and international institutions (e.g. World Bank, World Health Organization). For these reasons, it is important to analyze social cohesion and its mediating effects on income and health by utilizing a multidimensional approach. To complement this analysis of Wilkinson's definition of social cohesion, this thesis discusses his concepts of income inequality and absolute income and how they are conceptualized. Overall, this thesis addresses three research questions: first, does income, education or socioeconomic status have a greater direct effect on health status; second, what types of social cohesion play a mediating role in the relationship between income and health, and; third, are community psychosocial social cohesion indicators and length of residency more highly correlated with social capital and community behavioural social cohesion levels than social inequality indicators.

Chapter 1 describes Wilkinson's income inequality/social cohesion treatise, and in so doing, exposes some weaknesses in his argument. In sections 1.1 to 1.4 of this thesis, four main elements of Wilkinson's argument are addressed: first, his preference for income inequality over absolute income in explaining mortality rates in Western countries; second, his use of the social comparison perspective to explain the health gradient in society; third, how an individual's perceived placement in the social hierarchy determines her/his level of social cohesion; and fourth, the stress process model as an explanation of how lower income levels lead to poorer health outcomes. Outlining Wilkinson's theoretical framework reveals his work as mostly based on highly theoretical assumptions backed by contradictory evidence, and allows for a highlighting of the places where his argument could be enhanced and better tested empirically.

Following a critique of Wilkinson's income inequality/social cohesion treatise, the thesis describes a multidimensional approach, which improves Wilkinson's argument and empirical analysis. The empirical portion of the thesis tests his assumptions utilizing multiple regression analyses, examining the extent to which social cohesion acts as a mediator between income and health and whether it is predicted by income. In order to limit the scope of this thesis, the empirical portion focuses specifically on Wilkinson's conceptualization of social cohesion, and to a lesser extent his concepts of income inequality and absolute income. Following the introduction of the multidimensional approach to analysing social cohesion, a description and rationale are provided for the variables that are used in the thesis. Chapter 1 ends with a discussion of the research questions that are analysed in the empirical portion of this thesis.

Chapter 2 discusses the methodology used in this thesis. A description of the dataset, the benefits and downfalls of the chosen methodology, and an outline of the analysis for each research question are presented. Chapter 3 presents the results for all three research questions. Chapter 4 discusses the results and relates the findings to the critique of Wilkinson's treatise. The thesis concludes with a discussion on how this research adds to the social capital and health literature and the implication of the findings for future research.

Chapter 1 – Literature Review

Wilkinson's income inequality/social cohesion treatise (1996) is rooted in his work examining the health differences between rich developed nations. Wilkinson conceptualizes individual health as influenced by the structure of society; whether a society is considered egalitarian or not will ultimately determine how socially cohesive its citizens will be and how healthy the society will be. However, to understand how, according to Wilkinson, the macro affects the micro level, an outline of the four main elements of his treatise is warranted.

After the four main elements of Wilkinson's treatise are outlined, a critique of his argument follows in section 1.5. This section concentrates on flaws in his core assumptions and the empirical support he offers. This critique provides the basis of explanation for the proposed improvements to Wilkinson's argument and empirical analysis. These improvements serve as the framework for an analysis of the mediating effects of social cohesion on the income and health relationship.

Section 1.1 Wilkinson's Use of Income Inequality and Mortality Rates

The first element of Wilkinson's (1996) argument is that income inequality (relative status) is more useful than absolute income when explaining the differences in health status between rich industrial nations. Wilkinson (1996) found that absolute income (measured by GDP per capita) did little to explain the differences in life expectancies between rich developed countries². Wilkinson believed he had uncovered an 'important paradox' between the relationship of health and living standards within a

² Wilkinson (1996:36) considers rich developed countries those who are members of the Organization for Economic Cooperation and Development (OECD).

country (1996: 2). There was an assumption that income rises correspondingly with life expectancy, but Wilkinson discovered this was not the case for people residing within developed countries. To Wilkinson, it seemed as if these rich countries had “reached a threshold level adequate to ensure basic material standards for all” (1996:2). This was exemplified by the average absolute income level for each country being over the limit wherein all the basic human necessities are met, including food, clothing, and shelter. This led Wilkinson to hypothesize that if absolute income were not causing decreased life expectancies for some countries perhaps income inequality was. Wilkinson (1996) has statistically shown that people who live in rich countries with high income inequality, which was measured by the GINI³ coefficient, have lower life expectancies. This finding supports his belief that an egalitarian society has higher life expectancies because income and resources are more equally distributed throughout the population (Wilkinson, 1996; 2002). This statistical finding is the basis of Wilkinson’s argument; relative income levels explain the differences in life expectancies across rich developed countries better than absolute income levels.

Above and beyond this statistical ascertainment, a note is warranted here, and returned to later, on Wilkinson’s conceptualization of health. Wilkinson mainly relies on death rates or life expectancy rates as his main indicators of health status (1996: 55-57). He argues that mortality rates are the only objective measures of health, all others are subjective or ambiguous in their significance. An example he uses to justify his preference for death rates is the futility in trying to quantify certain illnesses.

³ The GINI coefficient is a measure of inequality, typically used to measure income inequality but technically can be used to measure any uneven distribution. The coefficient is a number between 0 and 1, “where 0 corresponds with perfect equality (where everyone has the same income) and 1 corresponds with perfect inequality (where one person has all the income, and everyone else has zero income)” (“Gini Coefficient,” 2005).

The problem with illness is not knowing how to count different things: are we to add cases of athlete's foot to cases of arthritis, headaches, chronic bronchitis, hay fever and ulcers? If so, how bad would they have to be to count? If we used pain or disability as a common denominator, how much pain or disability assessed by whom and how often? (Wilkinson, 1996: 55)

Illness is a subjective experience. A patient may be diagnosed with arthritis but experience less severe levels of pain than another patient with the same diagnosis. As well, with chronic conditions the issue of adaptability comes into account. For example, someone who has had allergies their whole life may have adapted to them by age 30 and may not 'feel' the symptoms are 'unbearable' or 'painful' when compared to the person who at age 30 begins to develop severe allergies. Wilkinson believes because it is impossible to turn the subjective experience of disease and illness into an objective measure of health, death rates should be used in lieu of self-rated health due to their inherent reliability as objective data (1996: 57).

A discussion of the theoretical framework (i.e., the social comparison approach) that underlies Wilkinson's treatise is presented next, showing how this framework applies income inequality over absolute income to explicate the social gradient of health.

Section 1.2 – Explaining the Health Gradient – Materialist vs. Comparison Viewpoints

Historically, there have been two main theoretical viewpoints to explain the health gradient in society: the cultural/behavioural explanation and the materialist/structuralist explanation (Raphael, 2004). The cultural/behavioural explanation is known as 'victim-blaming'- people are responsible for their health due to the unhealthy behaviours they choose to engage in, e.g., drinking heavily and smoking. This explanation was the dominant ideology for understanding the determinants of health for centuries (Foucault,

1994). The release of the Black and Health Divide Reports, in the latter half of the 20th century, produced a shift in this health ideology. Both Reports provided an alternative viewpoint to the cultural/behavioural approach by emphasizing the role of poverty in shaping people's health outcomes. Essentially, the Black and Health Divide Reports provided evidence that supported a materialist/structuralist explanation for the health gradient in society, arguing that people's material conditions are in large part responsible for their health outcomes even when taking into account their risky behaviours, like smoking and drinking (Townsend et al., 1990). The materialist/structuralist believes that material circumstances influence the availability of the basic necessities of life and social welfare services, as well as shape an individual's working and housing conditions, etc. Basically, the former emphasizes agency over structure and the latter emphasizes structure over agency.

Building on the cultural/behavioural and materialist/structuralist perspectives, the release of the Whitehall study in the UK shifted the focus to social status; thus contributing an additional variable to the knowledge base of the social determinants of health. The Whitehall study focussed on British civil servants who, in comparison to the general population, were making middle-upper to higher-upper levels of income. Those respondents who were located right below those at the top of the work hierarchy were found to have worse health, despite the higher-ups' engagement in risk-behaviours. Poorer health outcomes of civil servants on the lower end of the work hierarchy were shown to be a result of work-related stress. Subsequently, what was produced in the health inequalities literature was a reduction in the focus on absolute income and lifestyle

behaviours and an alternate focus on relative deprivation and psychological stress (Elstad, 1998).

In the social determinants of health literature, the acknowledgement of the role of social status in health outcomes has resulted in three main perspectives to understand the health gradient in society: materialist, neo-materialist and social comparison (Raphael, 2004). The materialist perspective is similar to the above mentioned materialist/structuralist explanation, in that it emphasizes people's material conditions as the source of inequalities in health. The materialist believes material conditions dictate the positive or negative conditions which an individual can be exposed to throughout their lives. For example, a child who is brought up in a low income household will have a higher propensity to do badly in school or drop out than a child who is raised in a higher income household (Bushweller, 2005).

Moreover, the materialist believes that material conditions lead to differences in how psychosocial stress is dealt with (Brunner & Marmot, 1999). For example, a low-income earner who deals with chronic stressors (e.g., providing the basic necessities of life) has more strain placed on their physiological functions (e.g., immune system, insulin defence, adrenaline responses, etc.) than a higher-income individual who may only deal with stressors on an occasional basis (McEwen, 1998; Baum Garofalo & Yali, 1999; Taylor & Seeman, 1999; Szanton Gill & Allen, 2005). Someone who deals with stressors occasionally, has a recovery time for their physiological functions to return to homeostasis, whereas someone who deals chronically with stressors has little or no time for their body to recover and this can eventually lead to poor health outcomes (McEwen, 1998; Lundberg, 1999; McEwen & Seeman, 1999; Goldstein & McEwen, 2002). In

addition, the materialist believes that low-income earners engage in poor behaviours, such as drinking and smoking, as a coping mechanism for having minimal material resources (Lynch, Kaplan, & Salonen, 1997).

The neo-materialist perspective expands on the materialist perspective by discussing how state structures (i.e., social infrastructure) shape health outcomes. To illustrate, a country that does not spread money and resources equally across the population will put less money into education, health and other social services which are pertinent to the wellbeing and health of a country's population (Lynch, Davey-Smith, Kaplan, & House, 2000). Neo-materialists emphasize the role of the state and state hegemony in shaping life chances for those who do not have the material resources to live a healthy lifestyle (Coburn, 2000). For example, neo-liberal ideology, which is the current political environment in North American society, emphasizes an increase in corporate spending and tax breaks for those in higher income brackets and a move away from social spending. This type of state political environment creates a weakened social infrastructure that produces an unequal distribution of resources amongst the population, and leads to health inequalities across the social gradient of society (Coburn, 2000).

The social comparison perspective, the perspective that Wilkinson bases his treatise on, does not see material deprivation as the biggest cause of poorer health status in unequal societies but instead emphasizes the 'perception' that people have of where they are in the social hierarchy as the cause of unequal health outcomes (Wilkinson, 1996; Kawachi & Kennedy, 2002; Raphael, 2004). In other words, it is relative deprivation (the result of income inequality), not absolute income, that is important to health outcomes. The social comparison perspective acknowledges a person's material

conditions, but operates on a different set of assumptions than that of the neo/materialists. The social comparison approach believes that, in the rich developed world, everyone has access to the basic necessities of life (e.g., food, shelter, and clothing), therefore the inequalities are focused on a new set of needs and wants that is the source of stress for people – commodities that represent status (Pearce & Smith, 2003).

Wilkinson's (1996) treatise states that lower income people perceive their place in the social hierarchy as lower relative to those from higher income groups and thus view themselves negatively. This is due to the low rate of consumption by low-income earners relative to high-income earners; low-income earners cannot own the same commodities as high-income earners. Consumption is defined as the "use of resources to satisfy current needs and wants" (Bannock et al., 1998: 76). Wilkinson assumes that all of a country's citizens have the same needs and wants. As a result, low-income individuals suffer from low levels of self-esteem, which are associated with increased incidences of violence and other maladaptive behaviours. These negative psychosocial effects lead to low social cohesion and poor health. Thus, Wilkinson argues that higher levels of self-esteem and positive self-image are achieved through owning the possessions of the high-income earners, which leads to increased social cohesion and good health (Marmot & Wilkinson, 2001). In a sense, Wilkinson's argument amounts to status being for sale in the market place in the form of commodities such as cars, big screen televisions, and brand name clothing. If an individual is poor, s/he obviously cannot afford to purchase such status-enriching commodities. This inadequacy in commodity purchasing is seen as detrimental to an individual's health and wellbeing. As long as someone has more

commodities than someone else, the relatively deprived will always be depressed, anxious, and insecure (Marmot & Wilkinson, 2001).

According to Wilkinson (1996; 1999; 2001) and others (Kawachi & Kennedy, 1997; Kawachi et al., 1997; Kawachi et al., 1999) the social comparison perspective discusses health outcomes as being influenced through two pathways; social cohesiveness and psychosocial stress. With respect to social cohesion, a comprehensive definition is discussed in section 1.3, followed by a deeper examination of its conceptualization in section 1.7.

Section 1.3 – Social Cohesion/Capital

According to Wilkinson (1996), developed countries with high income inequality typically have low social cohesion, which results in higher mortality rates. In the population health literature, social cohesion is typically mentioned in relation to two characteristics, individual and community (Berkman, 2000). Individual characteristics are defined as emotional and instrumental forms of social support; community characteristics are defined as behavioural and psychosocial forms of social cohesion pertaining to the community (Berkman, 2000; Stansfeld, 2002). Examples of community forms of social cohesion include neighbouring, rates of social participation, neighbourhood affiliation, and affectional ties for the community (Kasarda & Janowitz, 1974; Sampson, 1988; Woldoff, 2002). Community-level social cohesion is understood as resources that lead to social network formation, and individual-level social cohesion is understood as products that are the result of belonging to a social network (discussed further in Section 1.7).

However, a trend in the health literature (Wilkinson, 1996; Kawachi & Kennedy, 1997; Kawachi et al., 1997; Kawachi et al., 1999) is to discuss social cohesion in terms of the concept of social capital. Based on the work of Putnam, social capital is defined as the “features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions” (1993:167). Wilkinson conceptualizes social cohesion as social capital, a community-level resource, which leads to social network formation. He does not discuss the products resulting from social networks; instead, he assumes that products, such as social support, are incurred with the accumulation of social capital. In his work, the measurement of social capital tends to be restricted to two variables, civic participation and levels of interpersonal trust. Civic participation is defined as an individual’s involvement in formal groups or organizations (e.g., voluntary associations) and formal political involvement (e.g., voting in elections). Generally speaking, civic participation can be understood as one’s involvement in civil society (Lindstrom, 2004: 595).⁴ This involves membership in formal groups and organizations (Marshall, 1994). According to Wilkinson (1996), if both civic participation and levels of trust are high, the country’s population is said to be highly cohesive.

Section 1.4 – Psychosocial Stress

Wilkinson not only applies his treatise to explaining differences in health between countries but also to explaining differences in health within countries (Wilkinson, 1996).

⁴ “There are several competing definitions of what [civil society] involves. However, its key attributes are that it refers to public life rather than private or household-based activities; it is juxtaposed to the family and the state; and it exists within the framework of the rule of law (Marshall, 1994: 55).”

The fourth and final element of Wilkinson's argument, that is addressed, is how psychosocial stressors explain individual health outcomes.

The Whitehall study, which examined the health gradient between several different occupation grades of British Civil Servants over the course of ten years, found that those in the lowest occupational grades had a mortality rate that was three times higher than those located in the highest occupational grades (Marmot, Shipley, & Rose, 1984; Marmot, Kogevinas, & Elston, 1987). Marmot et al., (1984; 1987) found that lifestyle behaviours (e.g., heavy drinking, low physical activity, and smoking, etc.), did not account for very much of the variance in health outcomes. It was found that in the lower grade occupations there was a higher report of 'lack of control' and 'power' at work which translated into job-related 'stress' for the respondents, who reported such complaints as 'lack of skill utilization,' 'tension,' and 'lack of clarity,' in the workplace. Those who experienced a lack of control or power in the workforce also reported higher rates of blood pressure (Marmot et al., 1987: 78). Researchers (Marmot et al., 1984; Marmot et al., 1987) suggested that job-related stress, experienced in the absence of effective mediators, explained the remaining variance in health outcomes.

Wilkinson (1996) uses these findings from the Whitehall study to support his theoretical assumptions at the individual level. Specifically, he relies on the importance of psychosocial pathways in explaining the health gradient in rich developed countries. Wilkinson (1996) uses the term psychosocial pathways because relative inequalities are at the base of the inequalities of health within non-egalitarian societies, not absolute material standards (4-5). In other words, if an individual perceives her/himself at the lower levels of the social hierarchy s/he will be subjected to psychosocial stresses that

can impact health negatively. Such psychosocial stresses include anxiety, depression, anger, shame, and lack of control (Wilkinson, 1996; 2001). In regards to the Whitehall study, psychosocial stresses were experienced mostly by those occupying the lower grade occupations, who subsequently felt they had less control over their work environment than those located in higher grade occupations (Marmot et al., 1984; Marmot et al., 1987). As well, the Whitehall findings support Wilkinson's notion that absolute material standards are not influential in determining the variation in health outcomes amongst a population. This is due to the fact that all participants in the Whitehall study were making a sizable sustainable income to meet the basic necessities of life and there was still a health gradient amongst the sample population.

Wilkinson incorporates these Whitehall findings into his income inequality/social cohesion treatise. Wilkinson (1996; 1999; 2002) argues that areas where low-income earners reside are characteristically violent and hostile, the residents do not trust each other, feel disrespected, and suffer from low self-esteem. This is due to how low-income individuals perceive themselves in the social hierarchy of their society (Wilkinson, 1999). When a low-income individual compares her/himself to a higher-income individual who subsequently has more commodities than they do, this creates psychosocial stress for the low-income individual (Marmot & Wilkinson, 2001). This perception of inadequacy has psychosocial effects on the individual (e.g., anxiety, depression, low self-esteem, anger, and distrust) which impacts the physiological functioning of the body, mainly through neuroendocrine⁵ pathways (more specifically the adrenal glands), which can eventually

⁵ Neuroendocrine is the interaction between the nervous system and the hormones of the endocrine glands. An endocrine gland produces hormones that are passed directly into the blood stream. Examples of endocrine glands include: thyroid, parathyroid, anterior, posterior, pituitary, pancreas, adrenals, pineal, and gonads (Pathophysiology of the Endocrine System [PES], 2003). The Adrenal glands

lead to poor health outcomes. Wilkinson suggests that neuroendocrine pathways are the link between stress and health where social capital is the mediator of this relationship. Low-income individuals are chronically stressed, thus lacking the necessary social skills to form social networks to mediate the negative effects of stress and consequently suffer poor health status.

Section 1.5 – Shortfalls of Wilkinson’s Argument

The four points of contention with Wilkinson’s argument that require elaboration include: (1) an overstatement of the meaningfulness of his data; (2) lack of empirical evidence to support his theoretical framework; (3) the empirical evidence that he utilizes to analyze complex data only concentrates on a couple of indicators; and, (4) he emphasizes the usefulness of objective measures and dismisses subjective indicators. The following section discusses how the thesis enhances Wilkinson’s argument and empirical analysis.

The first criticism of Wilkinson’s argument is that he overstates the meaningfulness of his data. An example is his use of national statistics (GDP and GINI coefficient) to support his claim that income inequality (relative deprivation) is a better indicator of a country’s life expectancy than absolute income. But both the GDP and

produce hormones (e.g., glucocorticoids and mineralocorticoids) that enable the body to deal with the various small and major stressors it is faced with on a daily basis. Examples of stress range from taking an examination, recovering from a broken bone, starvation (even mild), and in human males, shopping can be considered a stressful event (PES, 2003). Examples of endocrine functioning include: increased rate and force of contraction of the heart muscle; constriction of blood vessels; dilation of bronchioles (helps us ‘breathe’); and increased metabolic rate (help in the breakdown of food to create energy for the body to run off of). An overload of stress without the mediating effect of social capital or other forms of social support can produce negative effects in bodily function (Wilkinson, 1996). Examples of negative endocrine function can include heart attacks, hypertension, diabetes, etc. (Uchino, Cacioppo, & Kiecolt-Glaser, 1996).

GINI coefficient are not without their flaws as statistical measures. GDP⁶ has been criticized for not being an adequate indicator for explaining the variations between household incomes. For example, Wilkinson uses a per capita GDP measure to determine average household income. However, an average does not provide any information regarding how that income is distributed throughout the population. An oil-producing country may have both a high GDP and per capita GDP, yet these measures do not necessarily provide any indication as to how that income is distributed within the population. For example, the oil-producing country may have a strong majority of the population living in poverty but the GDP would not disclose that. Therefore, to explain the variation in incomes across a country the GINI tends to be the preferred measure over the GDP, as it focuses on the difference (i.e., income gap) in income between the bottom 5% income earners and the top 5% of income earners.

But the GINI has also been criticized for not being able to explain the activity in the middle of the two incomes. In other words, the GINI tells us little about the proportions in each income level as it only focuses on the quantities of the extreme highs and lows. It would not be an ideal measure for countries that have a large population located in the middle-income range. As such, it would not be an adequate measure for most rich industrial nations, which have smaller percentages of low and high-income earners relative to their middle-income earners (Adler & Snibbe, 2003). Unfortunately, Wilkinson uses only these two measures to determine if a country is considered egalitarian or not.

⁶ Gross domestic product (GDP) is the value of all final goods and services produced within a nation in a given year (CIA Factbook, 2004).

Second, Wilkinson tends to provide little empirical evidence to substantiate his arguments. For example, when supporting his claims that low social status is an important psychosocial aspect in determining health status he cites studies involving non-human primates (Wilkinson, 2001). In order to support his assertions that negative psychosocial effects (e.g., feelings of distrust, disrespect, and low self-esteem) are created in those who are low-income earners, he uses the work of a psychologist who deals only with inmates (Marmot & Wilkinson, 2001). Thus, Wilkinson's argument is based on theoretical assumptions that are supported by mildly relevant empirical studies.

Third, the studies Wilkinson cites focus on a few variables to measure complex concepts and ideas. Most of the studies he references are in the social capital literature (Putnam et al., 1993; Kawachi & Kennedy, 1997; Kawachi et al., 1997; Kawachi et al., 1999) and tend to use only two variables (e.g., number of formal groups/associations one is a member of and interpersonal trust) to measure the level of social cohesiveness in a given population. For example, Kawachi et al., (1999) measure social cohesion using two variables, levels of inter-personal trust and percentage of households headed by single mothers. This has led to a general complaint found in the social capital literature that limited effort has been directed towards conceptualizing the term social capital (Cattell, 2001). For example, Cattell (2001) suggests it is problematic for researchers (Wilkinson, 1996; Kawachi et al., 1997) to utilize this limited form of social capital, as there has not been enough research conducted as to what factors constitute sufficient measures for 'community-level social cohesion.' Thus, these studies lack context. As well, there is a tendency to conflate social cohesion with social capital (Cattell, 2001). Cattell and Evans's (1999) research on deprived neighbourhoods in London, England has

found that just because a neighbourhood is poor does not automatically mean there are low levels of social capital. As well, social capital researchers have not taken into account studies (Frankenberg, 1966) on 'traditional working class communities,' which have used the presence of income inequality as a basis for forming solidarity (Cattell, 2001). Furthermore, Lynch, Due, Muntaner, and Smith (2000) believe that the current health policy focus on social capital may be overshadowing the importance of the effects of material conditions on health. As a result, Lynch et al., (2000) suggest that nation-states may be focussing on a concept that has yet to acquire consensual definition or be proven consistently relevant to health inequalities.

In addition, Wilkinson's definition of social cohesion does not include additional forms of social cohesion (e.g., social support), despite the fact that several studies have shown that those with high levels of emotional social support have better health outcomes than those without regardless of income (Cobb, 1976; Corin, 1994). However, there is no explicit mention of emotional, instrumental, or any other kind of support by Wilkinson, instead these qualities are presumed by-products of the 'formal group membership' and 'interpersonal trust' indicators. To illustrate, if one reports that they do have high levels of interpersonal trust it is assumed that they have social bonds/networks, and thus benefit from the emotional support of close friendships. By failing to compare additional forms of social cohesion the researcher will run the risk of making erroneous claims that social capital is the most meaningful mediator in the income and health relationship.

Fourth, Wilkinson's argument is universal; however, the concepts he describes are based in the subjective realities of individuals. For example, Wilkinson suggests that variance in health status is based on the social hierarchy within society and the societal member's

perceptions of where they are located within this hierarchy. This presumes that all individuals perceive themselves according to the same capitalist hierarchy. In other words, it assumes that we all want and need the same things and thus evaluate ourselves in regard to the same standard. As well, Wilkinson's argument suggests that there is only one hierarchy (capitalist) and ignores the possibility that individuals are stratified along other hierarchies, such as gender, sexuality, ethnicity, and age.

David Coburn has made a similar critique of Marmot & Wilkinson's (2001) article "psychosocial and material pathways in the relation between income and health." Coburn (30 July 2001) critiques their argument referring to it as "superficially persuasive" and outlines the same problems that were mentioned in the preceding paragraph. In regard to the capitalist hierarchy, Coburn asserts that Marmot and Wilkinson "never state or measure 'who are the Joneses' that is, to whom do individuals and groups compare themselves" (30 July 2001: 1). As well, Coburn comments on the problematic assumption that we all adhere to the same capitalist notion of status. "There are a variety of bases of status not necessarily directly income related. Academics pride themselves on how many articles they have written. The religiousi [sic] display various degrees of 'holiness.' Status may depend on characteristics other than income" (Coburn, 30 July 2001: 1). Wilkinson fails to recognize the individual experience of everyday life and consequently the subjective nature of individuals is replaced with one homogeneous whole.

Wilkinson's preference for 'objective' measures over subjective is apparent in his choice of health measure. It was mentioned earlier that Wilkinson prefers 'objective' death rates and life expectancies when measuring health than attempting the painstaking

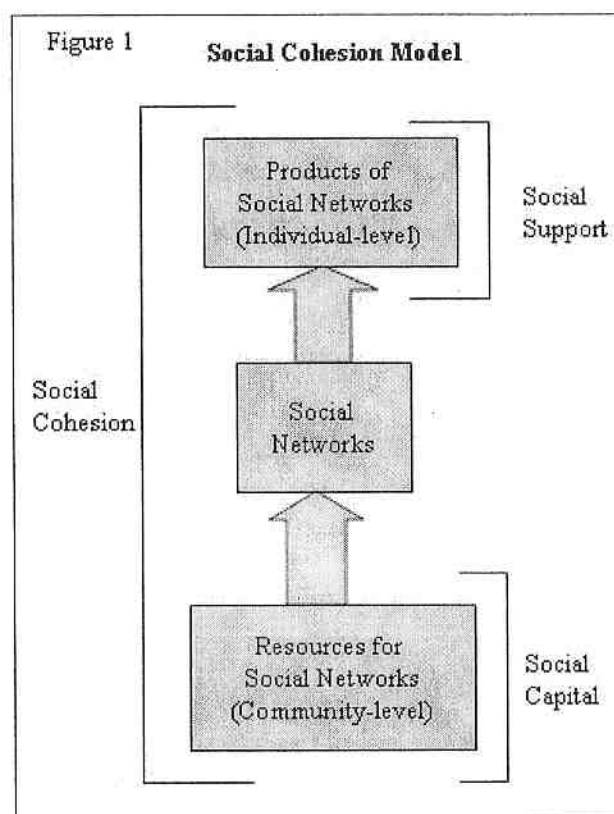
task of trying to quantify subjective measures of illness. Thus, the individual definitional aspect that a subjective measure of health brings to the picture is neglected. To illustrate, consider the following question: is a country that has a life expectancy of 85, and whose population at age 60 has a morbidity rate of 80% (i.e., spends the last third of their life disabled) considered healthier than a country where the life expectancy is 80, and whose population at age 60 has a morbidity rate of 20%? By ignoring the morbidity rate of a country there may be a false sense of how healthy a country is in regards to another. As well, death rates and life expectancies say little about the wellbeing of a population; people may be living longer but are they happier?

It would appear that Wilkinson chooses his measures based on how easily attainable they are and whether they support his argument (Mutaner & Lynch, 2002). It is this thesis' contention that Wilkinson is focussing on the wrong aspect of disease and illness. The issue of whether or not one has been diagnosed is not as important as whether or not that disease interferes with the activities of daily living (e.g., getting dressed in the morning, etc.,). Hence, it is important to use subjective measures of variables in conjunction with 'objective' measures to ensure a more comprehensive analysis.

Regardless of these flaws in Wilkinson's argument, factions of the health literature (Kawachi & Kennedy, 1997; Kawachi et al., 1997; Kawachi et al., 1999) have replicated his assumptions; thus, reproducing uncritical claims that support social capital as a social determinant of health. From here on in, this thesis will refer to this group of health researchers who support Wilkinson's assumptions as 'the social capital-health literature.' The social capital-health literature has used the concept of social capital

instead of an all encompassing definition of social cohesion and in doing so have used a limited number of indicators to measure a multi-faceted concept. They have excluded community-level psychosocial measures (e.g., neighbouring, neighbourhood affiliation, and affectional ties for the community), and individual-level measures (e.g., emotional and instrumental) from the conceptualization of social cohesion. By excluding psychosocial and social support measures, erroneous conclusions may be made about the degree of social cohesion in low-income neighbourhoods and more importantly the importance of social capital as a determinant of health. This thesis alleviates some of these flaws in the social capital-health literature.

Although these researchers use social cohesion and social capital interchangeably, this thesis will provide a conceptualization that includes these two concepts as well as social support. Social cohesion is a multi-faceted concept that utilizes both individual and community level indicators (refer to Figure 1). Social capital is one aspect of the concept of social cohesion, as it focuses primarily on community level indicators (e.g., resources that lead to social network formation) and ignores individual level indicators (e.g., products that are a result of social networks, such



as social support). The thesis discusses the interrelatedness of social cohesion, social capital, and social support in more detail in section 1.7. Henceforth, this thesis differentiates social capital from social cohesion by using the term social capital when referring to the community level indicators of social cohesion, thus avoiding the use of the two terms interchangeably.

Section 1.6 – How the Thesis Improves Upon Wilkinson’s Argument

In response to Wilkinson’s income inequality/social cohesion treatise, which suggests that psychosocial pathways affect health, a modified stress process model is proposed that considers Wilkinson’s variables but conceptualizes and analyzes them differently. The modified stress process model is based on Pearlin’s (1989) stress process model, and discusses stressors, mediators, and outcomes as parts of the stress process. This modified model provides an alternative theoretical argument to Wilkinson’s psychosocial pathway approach, and in turn recognizes the complexity of how stressors can impact health and produce individualized outcomes. The modified stress model will address the structural barriers that the stress process is rooted in (Pearlin, 1989). For example, the research will consider the affects⁷ of age, gender, education, SES, and income on the stress process. As well, the multidimensionality of the stress process is addressed by offering a broader definition of social cohesion. This includes four types of social cohesion to be considered as mediators in the model (e.g., emotional support, instrumental support, community behavioural, and community psychosocial).

⁷ Ethnicity was removed from the analysis due to little variability in responses, which were determined in the preliminary frequency counts.

Additionally, the modified stress model includes more behavioural and psychosocial measures at the community-level of social cohesion.

This thesis challenges the assumption that poor social environments (which house low-income earners) necessarily lead to low levels of social cohesion and investigates the utility of social capital as a determinant of health (Wilkinson, 1996; 2002; Kawachi et al., 1999). This challenge consists of secondary data analyses using quantitative survey data. The thesis utilizes both objective and subjective indicators for each concept in the analysis. This allows for an individual-level multidimensional approach to testing the mediating effects of the different types of social cohesion on the income and health relationship.

This thesis improves Wilkinson's treatise in the following four ways: (1) a detailed and comprehensive overview and critique of Wilkinson's concept of social cohesion is provided; (2) both individual and community level indicators are added to Wilkinson's concept of social cohesion; (3) more behavioural and psychosocial measures are added to the community level indicators of social cohesion; and, (4) empirical testing to contribute to the social capital-health literature. A short discussion regarding income inequality and absolute income is also offered. These improvements provide the necessary framework for the analysis of social cohesion as a mediator in the income and health relationship.

A main complaint against the social capital-health literature is that it fails to provide a rationale for use of certain variables. Section 1.7 provides a detailed overview of the social capital literature and presents an argument for a multidimensional concept of social cohesion. The second and third improvements to Wilkinson's treatise contribute a

detailed description of this multidimensional conceptualization of social cohesion. The second improvement adds both individual and community level indicators to Wilkinson's concept of social cohesion (discussed in Section 1.8). The third improvement describes how more behaviour and psychosocial measures need to be included with the community-level indicators of social cohesion (also discussed in Section 1.8). Fourth, this thesis contributes an empirical test to the social capital-health literature by conducting multivariate regression analyses to determine if Wilkinson's social capital variables act as mediators in the income and health relationship. A more detailed outline of the various research questions that are addressed in this thesis occur in section 1.9, the final section of the literature review.

Section 1.7 The Overlapping Conceptualizations of Social Cohesion, Social Support, & Social Capital and How They Are Applied in the Health Literature

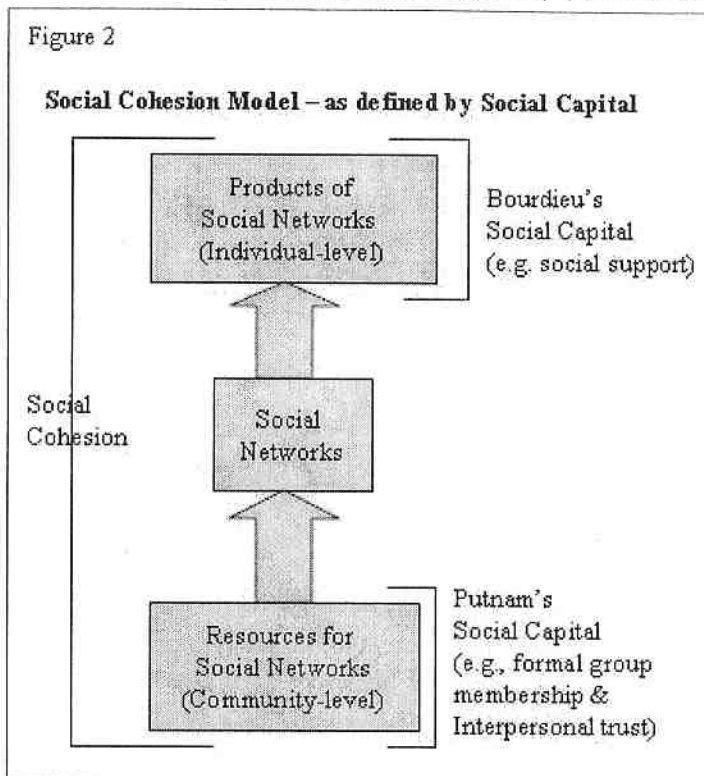
This section provides an overview and critique of Wilkinson's concept of social cohesion and its measurement using social capital variables. The section begins with an appraisal of the overlapping conceptualizations of the terms social capital, social cohesion, and social support found within the health determinants literature. Then the section draws upon the main cleavages in the social capital literature to discuss in more depth how Wilkinson's usage of social capital variables contributes to the lack of a multidimensional approach to the concept of social cohesion.

Social cohesion is an elusive concept consisting of several composite measures, such as social capital, social networks, and social support (Berkman, 2000; Beauvais & Jenson, May 2002; Stansfeld, 2002). Social cohesion is typically divided into two levels, individual and societal/community (Berkman, 2000; Stansfeld, 2002). The individual-

level has been defined as emotional and instrumental social support, which is acquired through social networks (Stansfeld, 2002). The societal/community-level has been defined using behavioural measures such as rates of community involvement (e.g., how many community activities are attended) and social and civic participation (e.g., formal and informal group membership for both civic and non-civic participation). As well, psychosocial measures such as interpersonal trust, neighbourhood affiliation, and affectional ties to the community (e.g., community sense of belonging, likelihood of moving from the neighbourhood if you had the opportunity, and desire to become involved in community affairs) have been used to quantify community social cohesion levels (Kasarda & Janowitz, 1974; Sampson, 1988; Beauvais & Jenson, May 2002; Woldoff, 2002). The social cohesion model used in this thesis, as outlined in Figure 1, conceptualizes social cohesion as including the following: behavioural and psychosocial community-level social cohesion (resources leading to social network formation); social networks, and; social support individual-level social cohesion (products received from social networks).

In the social capital-health literature (Wilkinson, 1996; Kawachi & Kennedy, 1997; Kawachi et al., 1997; Kawachi et al., 1999), the concept of social cohesion is measured using social capital variables. Social capital-health research focuses on community-level resources as opposed to individual-level products when measuring social cohesion (Lochner et al., 1999).

Since its emergence as a term, social capital has been conceptualized as a community-level resource and an individual-level product (refer to Figure 2) (Ziersch et al., 2005). Robert Putnam (1995) defined social capital at the community-level as the “features of social organisation such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit” (67). That is, social capital is a resource that facilitates social networks and groups that are involved in



civil society. Neighbourhoods or communities with high levels of social capital can help shape public policy at the provincial/state level, which can have positive effects on their community (Putnam, 1995; Wilkinson, 1996; Kawachi & Berkman, 1998).

On the other hand, Pierre Bourdieu (1986) defined social capital as an individual product, acquired through participation in formal and informal social groups and/or networks; social capital was defined as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships or mutual acquaintance and recognitions (248).” Individual-level products, such as emotional and instrumental social support –receiving information leading to employment (Granovetter, 1973), receiving advice on important matters, having someone

to confide in, or being able to ask for favours (e.g., borrow money) – were seen as a result of one's involvement in formal groups and organizations or from casual acquaintances in the neighbourhood. As well, there is another element of social cohesion albeit a rarely discussed one in the social capital literature (Macinko & Starfield, 2001): the psychosocial aspect of community social cohesion. One exception in the social capital literature is interpersonal trust. Interpersonal trust is commonly referred to as a psychosocial aspect of community social cohesion due to the belief by social capital-health researchers that trust is a necessary precursor to group membership and social network formation.

The psychosocial level places emphasis on the individual's 'perception' of their social environment and how this may impact their behaviour and health (Martikainen et al., 2002). Such psychosocial elements as neighbourhood affiliation and affectional ties for the community may create social capital for the individual by helping them to integrate effectively into the community (Kasarda & Janowitz, 1974; Sampson, 1988). Woldoff (2002) suggests that psychosocial elements may be predictive of social capital levels or community involvement. To illustrate, if individuals feel like they 'belong' to the community, they may decide to become involved in a community organization, which may benefit both themselves and the community through creating effective public policy. Subsequently, the individual may meet an acquaintance through their group membership which leads to an employment opportunity (Kasarda & Janowitz, 1974; Sampson, 1988); thus leading to the acquisition of social support. It is easy to see how social capital can operate as both a community-level resource and an individual-level product. In addition, the emphasis on behaviour (i.e. group membership) may be too exclusive for the concept

of social capital and consequently reveal too little about social cohesion. To increase understanding of how social cohesion mediates health it may be beneficial to add individual-level products and more psychosocial measures of community social cohesion to the analysis (refer to Figure 3).

Several scholars have noted the vagueness of the term 'social capital' in social science research and subsequently have questioned its significance in the health determinants

literature

(Woolcock, 1998;

Macinko &

Starfield, 2001).

The evidence that

high levels of social

capital correspond

with good ratings in

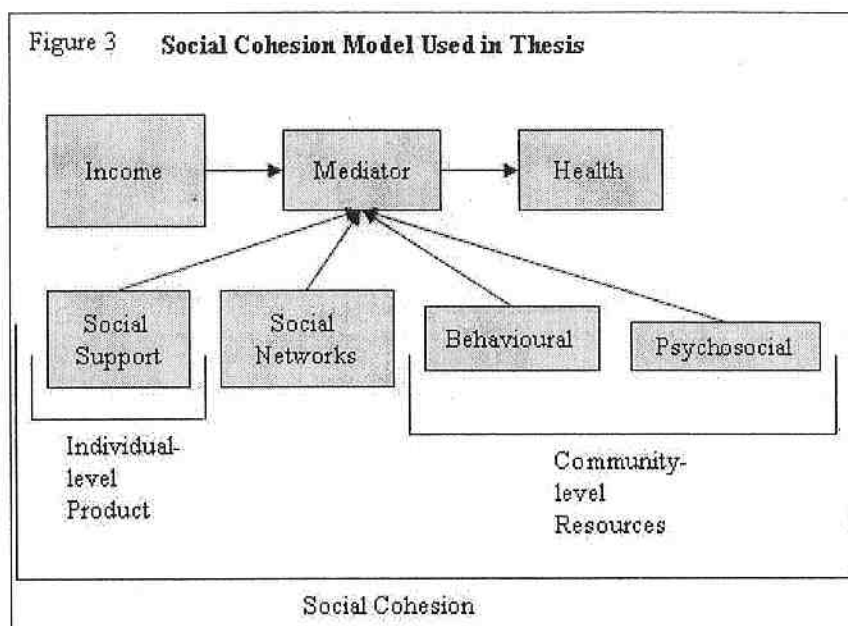
health status is not consistent (Veenstra, 2000). This may be due to a lack of consensus

when measuring and conceptualizing social capital (Ziersch et al., 2005). The problem

may occur in part due to the conflation of social cohesion with social capital—

community-level resources is just one aspect of social cohesion.

The use of social capital within the health literature has spurred an ongoing debate concerning how one should conceptualize social capital and what measures should be used (Brehm & Rahn, 1997; Woolcock, 1998; Macinko & Starfield, 2001). Typically, scales used to measure social capital consist of questions that represent a combination of



psychosocial attitudes and group behaviours (Macinko & Starfield, 2001). For example, Wilkinson uses responses to the statement “most people can be trusted” to measure psychosocial attitudes of interpersonal trust (Wilkinson, 1996), which according to the definition of the community-level social capital is used to determine the propensity of societal organization. To measure civic participation, he uses a scale that measures group behaviours and lists questions concerning “number of/attendance in formal or informal organizations” and “aggregated voting rates” (Wilkinson, 1996). The concern is the indicators that Wilkinson uses to analyze social capital and the extent to which they capture the level of social cohesiveness within a society. Critics argue that Wilkinson’s measurement and conceptualization of social cohesion is too narrow (Muntaner & Lynch, 2002). Muntaner & Lynch (2002) criticized Wilkinson for failing to include other variables in his definition of social cohesion, such as individual-level products of social cohesion, which include emotional and instrumental social support (Stansfeld, 2002).

There are problems using exclusively social capital variables to measure social cohesion, as it excludes additional measures of social cohesion, such as social support, social networks, and psychosocial community-level social cohesion variables. If an individual responds as having low-trust and low civic participation s/he is categorized as having low levels of social capital and thus low social cohesion, even though s/he may have a high-density social network (e.g., friends, co-workers, etc.), which provides beneficial levels of social support to the individual. As Woolcock (1998), Veenstra (2000), and Macinko & Starfield (2001) suggest, researchers could improve measures of social capital by including individual-level products such as emotional and instrumental social support to the conceptualization. As well, social network variables could be

included in the conceptualization of social capital; however, this is not the focus of this thesis.

Another point of contention is the minimal use of psychosocial variables in the conceptualization of social capital to measure social cohesion. Ostensibly, the social capital-health literature believes 'trust' to be indicative of social capital levels (Performance and Innovation Unit, April 2002). However, some researchers (Fukuyama, 1999; Forrest & Kearns, 2001) have reported problems with this assumption. For example, community Block Watch groups are seen as community resources, as they help to deter crime in the neighbourhood and leave residents with an illusion of safety in their community, even though these groups are formed because of their 'distrust' of others (Fukuyama, 1999). This suggests that trust should not be the only indicator of social capital levels and other psychosocial measures should be used as well, such as fear of crime and sense of belonging. Both low levels of fear of crime and high rates of community sense of belonging have been linked with high rates of community involvement (Gibson, Zhao, Lovrich, & Gaffney, 2002).

Adding additional psychosocial variables to social capital research could serve two purposes in understanding the relationship between social cohesion and health. First, psychosocial measures could be indicative of an attachment to the community, making the resident feel safe and secure in their environment, thus contributing to increased community involvement and emotional wellbeing for the individual (Woldoff, 2002). Second, psychosocial measures could be predictive of social capital accumulation levels, which are believed to produce a mediating effect on the income and health relationship. That is, the greater the sense of belonging one has to their community, the greater their

social capital, and thus the greater their health. In contrast, not feeling safe in the neighbourhood can lead to a decrease in community involvement, which can have the negative consequences of social isolation and exclusion for some segments of the population. This is evident in the gerontology literature, which shows that the elderly are especially vulnerable to becoming socially isolated and thus suffer poor health (Liska, Sanchirico, & Reed, 1988; Wilkinson & Marmot, 2003).

To summarize, the social capital-health literature tends to conflate social cohesion with social capital, whereby the emphasis is on the community-level behavioural aspects, with a limited focus on psychosocial elements, and an absence on individual-level products. A conceptualization of social cohesion that measures both the individual and community level has been suggested. That is, four types of social cohesion are included in this thesis: emotional social support, instrumental social support, community behavioural, and community psychosocial. In addition, an expansion of the psychosocial measures currently used in the social capital-health literature has been proposed. This would constitute a move from the solitary use of interpersonal trust to include the following indicators: fear of crime, sense of belonging, trust in neighbours, desire to be involved in community affairs, and belief that neighbourhood is healthy. The benefit of including four types of social cohesion, is a more inclusive and multidimensional approach to measuring social cohesion, which helps test the validity of Wilkinson's claims by comparing the mediating effects of social capital and social support on the income and health relationship.

Section 1.8 - The Stress Process Model

This section contains a discussion of the second and third improvements to Wilkinson's treatise. An outline of the multidimensional approach to the analysis of the mediating effect of social cohesion in the relationship between income and health is described. First, an outline of the stress process, the theoretical framework in which the multidimensional approach operates, is described. Second, the various aspects of the stress process (i.e., stressors, mediators, and outcomes), and where the variables for the analysis fit in the stress process is described. Following the outline of the stress process, the various control variables are discussed.

The Stress Process Model

Health is a complex phenomenon, wherein a variety of determinants have been proposed to influence its outcome. The stress process model is often considered when conceptualizing how social factors such as income levels and status determine health (Raphael, 2004). Wilkinson's use of psychosocial pathways to explain the health gradient is an example of the stress process being used to explain the effect that income has on health outcomes (Marmot & Wilkinson, 2001).

The stress model can be understood as having three components: (1) stressors, (2) mediators and (3) outcomes. Most stressors do not occur in a vacuum, but are deeply embedded in the social structures around us and our places within them. According to Pearlin (1989), these structures can be understood as:

the various systems of stratification that cut across societies, such as those based on social and economic class, race and ethnicity, gender and age. To the extent that these systems embody the unequal distribution of resources, opportunities, and self-regard, a low status within them may itself be a source of stressful life conditions (242).

This quote suggests that the types of stressors that one is exposed to depends on where one's position is in the social hierarchy and that this contributes to health differences between different groups of people. Previously, stress models have tended to focus on life events as potential stressors (e.g. divorce, deaths in the family, job loss, etc.). Pearlin's (1989) proposal marked a shift towards including chronic stressors that are embedded in our socially stratified environment (e.g. low income, unfulfilling job, etc.). Those who face chronic stressors may be more susceptible to stressful life events, including job loss and subsequently greater health problems (Pearlin, 1989; Elstad, 1998). This approach is also consistent with the tendency to assume that lower income individuals are at an immediate disadvantage in terms of mediating the stressors they encounter throughout their lives (Elstad, 1998).

According to Wilkinson (1996), income affects all three aspects of the stress process. Being a low-income earner is conceptualized by Wilkinson as a chronic stressor that reduces the individual's ability to be socially cohesive (mediator) and thus the individual suffers from poor health status (outcome). On the other hand, the high-income earner tends to have lower levels of chronic stress, be more socially cohesive, and subsequently benefit from healthier outcomes. This ignores the evidence that suggests health is determined by our placement in a variety of inequality structures including those based on gender and age⁸ (Graham & Kelly, 2004).

This thesis does not argue that income is not a stress factor, but rather that it does not determine one's level of social cohesiveness. For instance, the relationship between

⁸ This is not to suggest that there are not other types of inequality hierarchy structures which can affect health negatively, such as ethnicity, sexual orientation, etc. These other inequality indicators are not discussed because the data used did not address it (e.g., sexual orientation) or the indicator did not have enough variation in the response for it to be significant for an analysis (e.g., ethnicity).

income and health may also be affected by demographic variables (e.g., age and gender), psychological factors (e.g., self-efficacy and internal health locus of control), and lifestyle factors (e.g., drinking, smoking, healthy eating, etc.). As well, as Pearlin (1989) has mentioned, life events (i.e., acute stressors) may aggravate chronic stressful conditions, for example the loss of a job may add considerable 'stress' to a low income family. However, it does not necessarily follow that the influence of income on health produces a negative impact through reduced social cohesion levels. Certainly, more research is needed to demonstrate a correlation. The following subsections address the plethora of variables that may impact on the stress process that are not considered by Wilkinson and others in the social capital-health literature.

1.8.a – Stressors

Socioeconomic Status, Income, and Education (Income Inequality vs. Absolute Income)

Wilkinson's treatise utilizes income inequality over absolute income to display the health disparity between populations in rich industrial nations. He uses the GINI index to measure income inequality and a country's average GDP to measure absolute income. Section 1.5 discussed the problematic assumptions associated with using both the GINI index and average GDP. This thesis conducts an individual-level analysis, which differs from Wilkinson's country-level analyses; thus, choosing comparable conceptual measures congruent with the dataset utilized in the secondary data analyses. Therefore, this thesis uses SES to measure income inequality, and annual household income to measure absolute income.

Young (2005: 151) defines SES⁹ as the “possession of material and social resources (such as income and education [and occupation]) and rank or status within a social hierarchy in relation to access to and consumption of goods, services, and knowledge.” The three indicators that constitute SES, income, educational attainment, and occupational status, have all individually been associated with health outcomes. However, when examining the effects of social status on health these three variables have been found to yield more significant results when combined instead of used in isolation from each other (Daly, Duncan, McDonough & Williams, 2002; Adler & Snibbe, 2003).

The health literature rarely uses the combination of income and education as an indicator of status (Cairney, 2000). Daly et al., (2002) found, in their meta-analysis of the health literature that used SES, the preferred SES indicators of researchers included education and occupation, with less emphasis on income and wealth. Daley et al., (2002) argue income was the least utilized variable for SES due to the lack of reliable data on income, and the belief that respondents are reluctant to answer honestly to questions regarding income and wealth¹⁰.

The rationale for using SES, a combination of income and education, is that it is an adequate substitute for Wilkinson’s income inequality concept. SES does not separately measure absolute income and education levels but attempts to measure an individual’s status level within a society by combining both variables. The operating

⁹ Socio-economic status (SES) measures an individual’s class position using a variation of income, education, and/or occupational indicators (Marshall, 1994). SES is the preferred term over class despite the fact that they both measure the same concept and use the same variables (Evans, 2002). This thesis uses SES instead of class in order to circumvent the contentious debates that often accompany a class analysis. For more information regarding the reluctance to use the term ‘class’ in North American health research, refer to Evans (2000).

¹⁰ Exceptions do exist; the US utilizes income the most frequently for their SES indicators (Daly et al., 2002).

assumption is that lower status individuals feel relatively deprived when comparing themselves to a higher status individual.

However, the SES variable is not without its problems. SES suffers similar drawbacks as income inequality; presuming all individuals measure their status along the same social hierarchy. For example, one can imagine the difference in experiences between the higher status white man and the higher status black woman. Clearly, SES affects health outcomes differently for diverse social groups, who differ along the lines of gender, age, and ethnicity (Daly et al., 2002). However, all things being equal, SES does capture status in regard to an individual's income and education level and, in this sense, it can be argued that a low status individual is relatively deprived, in relation to income and education, when compared to a high status individual. Although, an indicator that captures an individual's feelings of relative deprivation when compared to others in their shared society would help considerably with assessing Wilkinson's argument; however, the dataset used for this thesis does not contain this type of indicator.

A comparable measure to Wilkinson's absolute income variable was annual household income. However, this indicator was somewhat problematic. Income only measures an individual's annual household income and does not take into account the wealth of the individual. Typically, an elderly individual who has alternative sources of subsistence (e.g., pensions) that are not categorized as income per se, fits this scenario (Daley et al., 2002). Despite the flaws of the SES and income indicators used in this thesis, they constitute comparable measures to Wilkinson's concepts of income inequality and absolute income. Furthermore, the stress-process conceptualizes SES and income indicators as stressors in the model. Subsequently, this thesis utilizes these variables to

test if income inequality or absolute income is a better correlate of health status. The results of this analysis contribute empirical evidence to the debate regarding Wilkinson's income inequality/relative deprivation treatise.

1.8.b – Mediators

The Multiple Types of Social Cohesion

Within the social cohesion literature, different disciplines focus on different aspects of social cohesion. Social work tends to focus on emotional and instrumental forms of social support (Berkman, 2000), while sociology and population health tend to focus on social capital as a community resource (Pearlin, 1989). These two approaches are rarely combined or expanded to analyze extended community ties (e.g., neighbouring) or psychosocial measures (e.g., sense of belonging) as forms of social cohesion.

Sidney Cobb (1976) was one of the first to address the importance of social support as a mediator of life stress. Using three categories, he conceptualized social support as the type of information that one receives about one's self:

- 1) Information leading the subject to believe that he is cared for and loved;
- 2) Information leading the subject to believe that he is esteemed and valued;
- 3) Information leading the subject to believe that he belongs to a network of communication and mutual obligation (Cobb, 1976: 300).

The first form of social support is commonly termed 'emotional support' and is found in dyadic relationships, which provide relief and nurturance on a reciprocal basis (Cobb, 1976). The second form provides 'esteem support,' where one is given a sense of self-worth through public interactions (Cobb, 1976). These forms of social support can be found within the community that the individual resides in or outside of that community.

The third form of social support is provided through formal or informal organizations where everyone has a sense of mutual obligation (Cobb, 1976). Cobb provides a useful starting point to understanding the different levels of social support that exist for people.

As well, Boissevain (1974) recognizes the importance of social ties other than intimate ones and ties that are a result of participation in groups. His six 'zones' can be divided into three types of social support: (1) emotional (personal, intimate A, and intimate B zones); (2) instrumental (effective zone)—people who are helpful for economic, and political purposes as well as in everyday life (Berkman, 2000), and; (3) extended community ties (nominal and extended zones)—people who we do not know well, but who help us get things done, like finding a good doctor or where to shop (Berkman, 2000). The third level of social support is understudied in the health literature but is of great importance to health policy and health outcomes. Without these community ties, everyday life becomes more difficult and alienating, which can produce negative health consequences for the individual (Berkman, 2000; Wilkinson & Marmot, 2003). These extended community ties may be understudied due to the complicated nature of analyzing these forms of social support. One possibility for measuring extended community ties in surveys would be to include a question like: "How many of your neighbours do you know?" This would include people whom respondents may not know by name, but who they recognize by face. As well, sense of community or one's sense of belonging to a community or neighbourhood may be a way of measuring extended community ties as a form of social support.

As mentioned earlier, social capital tends to restrict its measures to civic participation and trust as it pertains to the group, excluding non-civic participation

measures (e.g., book club with friends). As well, Wilkinson asks questions that do little to contextualize the environment in which the individual is embedded (i.e., extended community ties). Other researchers (Lochner et al., 1999; Ziersch, et al., 2005) have expanded the scope of social capital to include questions that measure sense of community, attachment to place, and social interaction with neighbours (e.g., number of neighbours known to respondent).

This thesis draws upon the works of Cobb (1976) and Boissevain (1974) as a foundation for conceptualizing the various types of social cohesion used in the empirical analysis of this thesis—emotional social support, instrumental social support, community behavioural social cohesion, and community psychosocial social cohesion. The first type of social cohesion (emotional support) occurs at the individual level and primarily involves intimate relations such as people we confide in and trust. These people who make up the first level of social cohesion do not exclusively provide emotional support but can provide instrumental support as well (e.g., help in the logistics of daily life, etc.). The important aspect that must be present in this first type of social cohesion is intimacy. Wilkinson's (1996) work on social cohesion does not include measures of emotional social support. In this thesis a perceived emotional support scale (PESS) is utilized to avoid mistakes in assuming supportiveness within certain types of relationships. For example, earlier surveys would consider being married as a form of social support, but evidence found that marital status was only considered a form of support by men and not so much for women (Berkman & Syme, 1979). To avoid this methodological weakness the PESS asks questions that require the respondent to indicate if s/he feels they have someone they can confide in or if s/he feels they have someone whose opinion they have

confidence in. These types of questions eliminate the assumption that certain types of relationships indicate emotional support and instead leave the emphasis on the respondent to report if they feel they have emotional support.

The second type of social cohesion (instrumental) occurs at the individual level and primarily consists of those relationships that exist at the public level, these are not necessarily people whom we have intimate relations with (Cobb, 1976). These people could include friends/acquaintances—people we are not ‘close’ to but nonetheless we may call up on the phone if we need something practical (i.e., non-emotional) accomplished (i.e., finding a good doctor or hairdresser, someone to borrow money from in times of financial difficulty, etc.) (Berkman, 2000). Asking if the respondent feels s/he has someone in their life who would loan them money or let s/he live with them if they ran into financial trouble, help eliminate the task of deciding what types of relationships are indicative of instrumental support and instead place the emphasis on whether or not the respondent perceives s/he has instrumental support. Wilkinson’s (1996) conceptualization does not include forms of instrumental support.

The third and fourth types of social cohesion occur at the community-level. They are community behavioural social cohesion (CBSC) and community psychosocial social cohesion (CPSC). The third type of social support, CBSC involves interaction with others, whereas the fourth type of social support, CPSC refers to how one ‘feels’ and ‘perceives’ her/his situation to be in her/his community.

Similar to Boissevain (1974) and Cobb’s (1976) social support categories, the third type of social cohesion, CBSC, reflects membership in groups or networks at the community-level. This differs from Wilkinson’s conception of social cohesion, as it is

not restricted to civic participation group membership but includes informal group membership, and number of community activities attended. Some researchers (Granovetter, 1973) argue that this type of community engagement leads to network formation and the production of “weak ties.” Granovetter (1973) discusses the importance of ‘weak’ ties, those people who are mutual acquaintances, when providing important information leading to employment opportunities.

The fourth type of social support draws upon the community attachment literature (Kasarda & Janowitz, 1974; Sampson, 1988; Woldoff, 2002) and differs from traditional conceptualizations of social cohesion as it acknowledges the ‘emotional’ aspect of community-level social cohesion. ‘Emotional’ draws upon the sociology of emotion literature and in this context is different than emotional social support (discussed earlier). Examples include the following: how one feels about their community; do they feel like they belong to their community; and do they feel safe in their neighbourhood. Responses to these questions are entirely subjective and are influenced by a whole host of possible responses from within the individual that are not easily if at all quantifiable (Elstad, 1998). Nonetheless, perceptions of fear and sense of belonging have been shown to be influential to one’s mental and emotional wellbeing (Elstad, 1998; Forrest & Kearns, 2001).

Another area of research relevant to this thesis is how psychosocial aspects of social cohesion influence CBSC. Whereas Wilkinson’s treatise suggests that inequality indicators such as income are the most telling of one’s participation in groups, other research (Woldoff, 2002) has suggested that psychosocial aspects are more influential in

determining levels of social integration. The psychosocial variables discussed are fear of crime and sense of belonging.

Fear of Crime

Fear of crime, whether the threat of crime is perceived or 'real,'¹¹ tends to be understood in the literature as detrimental to one's health (Chandola, 2001; Shields, King, Fulks & Fallon, 2002; Beaulieu, Leclerc & Dubé, 2003). Literature on fear of crime has found that it can produce negative outcomes on general perceived health (Chandola, 2001; Franzini et al., 2005) and emotional wellbeing (Beaulieu et al., 2003; Whitley & Prince, 2005). Individuals who perceive crime as a problem in their neighbourhood reduce their social participation (especially while alone at night) and in the most extreme case become socially isolated (Thompson & Krause, 1998; Marmot & Wilkinson, 2000). Fear of crime has been conceptualized as an alternate measure of social capital (Chandola, 2001), a product of neighbourhood disorder (Franzini, Caughy, Spears & Esquer, 2005), a correlate of social capital (Lindström, Merlo & Östergren, 2003), and a correlate of social cohesion (Pain, 2001; Wolchoff, 2002; Whitley & Prince, 2005).

Chandola (2001: 106) suggests that fear of crime can be conceived of as an alternate indicator of social capital (community resource), which measures lack of community trust and networks. In this regard, fear of crime affects health negatively through the stress process (Chandola, 2001). However, Fukuyama's (1999) work on trust suggests that fear of crime could foster social networks which combat crime, as is the case with community Block Watch programs. Much research has gone into understanding where the perception of threat to safety comes from (i.e., neighbourhood

¹¹ "Real" refers to fear of crime being measured by rates of victimization.

disorder) but that is not the sole purpose of its inclusion in this thesis¹². Instead, perceived fear of crime is addressed here as a form of CPSC; an individual's perception of her/his community that may mediate the income and health relationship. In addition, fear of crime is used as a potential correlate of social capital and CBSC.

Sense of belonging

In the urban studies literature, sense of belonging has been the focus of much research, especially in relation to the social phenomena of rapid urbanization (Kasarda & Janowitz, 1974; Sampson, 1988; Sampson, 1991). One of the main beliefs is that urbanization has deteriorated social bonds between people and thus has created poor rates of sense of belonging (Kasarda & Janowitz, 1974). In contrast to this argument, studies (Sampson, 1988; Sampson, 1991) have shown that it is not urbanization that has caused a lack of social bonds in the community but length of tenancy (this is discussed in more depth in subsection 1.8.d). That is, the longer an individual lives in their neighbourhood with their neighbours the greater their sense of belonging (Sampson, 1988; Sampson, 1991). Sense of belonging has also been identified as a correlate of community behavioural indicators (Woldoff, 2002). The more sense of belonging an individual has the more likely s/he will become involved in formal groups and organizations (Pooley, Cohen, & Pike, 2005). As well, studies have shown that the higher an individual's sense of belonging, the more likely s/he will rate the neighbourhood as a positive place to live and the more likely s/he will want to become involved in community affairs (Woldoff, 2002). As the social capital-health literature argues that social capital is a determinant of health, this thesis suggests that CPSC variables (e.g., sense of belonging, healthy

¹² In the event that fear of crime does produce a mediating effect on income and health, the statistical analysis will determine whether social inequality, CPSC, and length of residency variables predict fear of crime. This is discussed in more detail in Section 1.9 and Chapter 2 of this thesis.

neighbourhood, and desire to be involved) may be determinants of health as well and potential mediators of the income and health relationship.

1.8.c – Outcomes

Health

This thesis utilizes the definition of health decided upon by the World Health Organization (WHO), which states “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (World Health Organization, 1948: 100).”¹³ In the past, health was conceptualized as merely the presence or absence of disease and failed to consider seriously social factors (e.g., environment, political, economic, etc.) or the respondent’s subjective viewpoint (Foucault, 1994). This was mainly due to the dominance of the medical profession and the biomedical model of disease (Foucault, 1994). Now, health researchers and policy analysts have achieved consensus that health inequalities are influenced by social factors in addition to lifestyle factors (e.g., smoking, alcohol consumption, etc.) and biological factors (e.g., genetic makeup) (Health Canada, 1998; Raphael, 2004; Townsend et al., 1992). This shift in ideology dates back to the 19th century and early 20th century public health movements in Britain and the United States when a noticeably higher rate of disease among the poor was discovered (Berkman & Kawachi, 2000b). Public health movements responded to subsequent epidemics by improving housing conditions, increasing sanitation measures, and improving nutrition, etc., (Berkman & Kawachi, 2000b). The WHO’s definition of health suggests global acceptance of the inclusion of social factors into the conception of health (Evans & Stoddart, 1994) and for influencing

¹³ See also <http://www.who.int/about/definition/en/>

the current trend in health care to take into consideration the patient's subjective viewpoint when evaluating their health and wellbeing (Wyrwich & Wolinsky, 2000).

Influenced by the WHO's definition of health, the conceptualization of health used here consists of four aspects: (1) physical health, (2) mental health, (3) general wellbeing, and (4) the presence of disease (e.g., physician diagnosed chronic conditions). The first three areas rely on the respondent's evaluation of their health and the fourth relies on a physician's evaluation of the respondent's health. Both physical and mental health is measured. As well, taking into account role limitations (i.e., measure of disability) allows for a more complete picture of an individual's health status. Looking at just life expectancy rates reveals nothing about the quality of life during those years. For example, women live longer than men but also experience a higher percentage of disability during their lifespan than men (Clarke, 2000).

The third area of health takes into account the individual's subjective viewpoint by measuring the respondents' perceived general health. Questions such as, 'in general, would you say that your health is excellent, very good, good, fair, or poor,' are typically used to measure self-rated health and are typically considered valid and reliable measures of health (McDonough & Berglund, 2003). Multiple studies have found that this subjective measure of health is a better indicator of mortality rates than other 'objective' or 'physician-defined' measures of health (Mossey & Shapiro, 1982; Idler & Benyamini, 1997). For example, Menec & Chipperfield (2001) found that self-rated health was a better correlate of health care usage than other 'objective' measures of health, such as rates of morbidity, functional disability, and prior health care use. Those who rated their health as poor or fair visited the physician more frequently, incurred more medical tests,

and were hospitalized more often than those who rated their health as good or excellent (Menec & Chipperfield, 2001: 302). Research has supported the notion that those who frequent the health care system (e.g., physician visits, medical testing, etc.) more often are more likely to perceive their health as worse than those who do not utilize health services as often (Rodin & MacAvay, 1992; Menec & Chipperfield, 2001).

Including all four areas of health allows for a more all-encompassing examination. This is important because it captures the multidimensional aspects of health (McDowell et al., 2004).

1.8.d – Control Variables

Demographic Factors – Age and Gender

Age

As one ages, health declines (Clarke, 2000). In seniors, those aged 65 or above, the effects of unhealthy living (e.g., smoking, poor nutrition, etc.) are more pronounced than they are for middle-aged individuals (Martel et al., 2005). Since this thesis focuses on middle-aged people between the ages of 35 and 65 a large percentage of the respondents are unlikely to report poor states of health. Wilkinson tends to use data from respondents who are non-institutionalized adults aged 18 or older (Kawachi et al., 1999). This thesis has the advantage of focusing solely on those who are middle aged and as such, the effects of social capital can be isolated to one particular age group. For example, it has been shown that seniors tend to have higher rates of social capital than other age groups (Veenstra, 2000). As well, different age groups tend to utilize different forms of social capital. For example, seniors tend to have higher rates of church attendance than younger age cohorts, etc., (Veenstra, 2000). In relation to Wilkinson,

who uses a limited number of social capital indicators, this could subsequently provide inaccurate results; teenagers have low group membership in formal organizations thus have low social capital. Focusing on one specific age group avoids the complexity of discerning which types of social capital or CBSC measures are characteristic of particular age groups.

Gender

In general, women tend to live longer than men at all ages during the life cycle (Clarke, 2000). But women tend to become ill or disabled more frequently than men. That is, women tend to have higher morbidity rates than men (Clarke, 2000). When it comes to mental health issues women tend to be diagnosed with depression more than men (Wilkinson & Marmot, 2003). As well, women tend to be disproportionately represented in lower income categories or experience poverty more than men (Wilkinson & Marmot, 2003). It is also likely that women report lower levels of health and general wellbeing as a result of their lower status on the gender hierarchy (Graham & Kelly, 2004).

Reasons suggested for this discrepancy are that it is more socially acceptable for women to be aware of symptoms, report illnesses to the appropriate authority, and embrace the sick role, whereas for men it is not as socially acceptable to be sick (Nathanson, 1975; Lahelma, Martikainen, Rahkonen & Silventoinen, 1999). Generally, women may report more chronic conditions or mental health problems than men because of the increased likelihood of women visiting a doctor and having a diagnosis made. However, researchers have found that this is not always the case. For example, women may report higher morbidity, disability, mental health issues, and chronic conditions but

will rate their general health and wellbeing as good or excellent (Menec & Chipperfield, 2001).

As well, some research (Stronks, van de Mheen, Van Den Bos, & Mackenback, 1995; Matthews, Manor & Power, 1999) has found gender differences in the SES-health relationship; men were more adversely affected than women were. Traditional gender roles ascribed to men and women may explain this finding. For example, men are expected to be economically focused and women to be emotionally focused in their roles. This produces an expectation that men must work in higher status careers and make more money than their female counterparts make. Conversely, there is an expectation that women are to be nurturing and engage in more emotionally supportive behaviour. Thus, it is likely that because men tend to identify more with status seeking and income related activities, they will be more adversely affected by occupying a low status/low income class than women. This gender socialization could help explain the gender differences in social support. Women are more likely to utilize social support than men, which may create different mediating effects on the relationship between SES and health (Flaherty & Richman, 1989). In other words, women may be more likely to benefit from the mediating effects of social support than men. In the SES and health relationship, social support has been found to lessen the negative impacts of SES on health, thus creating a mediating function. If women are more likely to utilize social support than men, women will also be more likely to have better health outcomes, regardless of SES. Hypothetically, social support would mitigate the negative effects of income on health and more so for women than men.

Psychological Factors - Self-efficacy and Internal Health Locus of Control

The role of individual psychology in terms of mediating stress is potentially an important one. According to Kobasa et al. (1981), individuals with a 'hardy personality style' tend to view change as an integral part of life and view potential 'stressors' as opportunities to further develop themselves (Kobasa et al., 1981). Those lacking in hardiness, on the other hand, tend to fear change and subsequently feel powerless and pessimistic in the face of stressors (Kobasa et al., 1981). Self-efficacy is the belief that you have control over the outcomes in your life and the internal health locus of control is the idea that you have control over your own health outcomes. Self-efficacy and internal health locus of control studies have been used as measures of 'hardy personality style' and subsequent studies have shown that high levels of self-efficacy and high internal health locus of control tend to mediate stress and produce healthier outcomes than those with low levels (Cheung & Stephen, 2000). As well, there have been studies that have found positive associations between SES and self-efficacy (Taylor & Seeman, 1999). Thus, if you are from a high-income group you can be expected to have high levels of self-efficacy and internal health locus of control and therefore better health. This is not to suggest that high-income levels create self-efficacy in individuals per se, but that there is a positive correlation between the two—both income and self-efficacy tend to be strongly associated with good health status.

Lifestyle Factors

Lifestyle factors, such as eating healthily, exercising regularly, moderate alcohol consumption, and not smoking, have been largely associated with positive health status (Martel et al., 2005). Smoking and other risk behaviours have been found to be

overrepresented in lower income populations (Lynch et al., 1997). This finding tends to elicit a 'blame the victim' response from public policy makers and policy formation tends to suggest that better health outcomes are possible if people just 'give up' their bad habits. However, this formulaic thinking ignores the role that social inequalities play in health outcomes. Research that has examined income in conjunction with lifestyle factors and their impacts on health status have found that lifestyle factors explain some of the health outcomes but not as large a percentage of variance as income (Townsend et al., 1992). As mentioned earlier, the UK's Whitehall study was one of the instrumental studies to bring social factors, such as one's place in the social hierarchy, to the foreground over lifestyle factors (Evans, 1994). In other words, lifestyle factors likely explain a small proportion of the variance of health.

Acute Stressors (Life Events)

Researchers (Marmot, et al., 1987; Williams & Lawler, 2001) have documented the negative effects of stress on health. As mentioned at the beginning of Section 1.8, an individual who is under chronic stress is likely to be more susceptible to negative health outcomes. In addition, acute stressors, or life events may have negative health consequences for the individual (Pearlin, 1989). Acute stressors, such as a death in the family or job loss may produce disproportionate results that would not be present in the absence of the stressor. For example, an individual who loses their father may report depressed feelings and subsequently report low health status. To control for an individual who does not suffer from chronic stress but may at the time of study be experiencing a stressful life event, an acute stressor variable (measured by perceived stress) was added to the analyses.

Length of Residency

In the community studies literature, there are two main streams of thought on the correlates of an individual's level of social cohesiveness.¹⁴ The first, a macro-level perspective, suggests that the increase in population density and the rise in urbanization reduce an individual's ability to become involved with their community (Bolan, 1997; Kasarda & Janowitz, 1974; Sampson, 1988). The second theory, a micro-level perspective, suggests that the length of time an individual has lived in the community is more telling of how socially cohesive s/he will be (Sampson, 1988). The latter is the explanation considered in this thesis.

The notion of length of residency as indicative of one's level of community attachment is supported by studies (Carlisle-Frank, 1992) that suggest after moving into a new area it can take anywhere from 6-18 months to form attachments to the community. Several studies have found that length of residency is a more adequate indicator of social cohesion (e.g., friendship ties in the community and civic participation) even when taking into account the previously mentioned macro-level factors, socioeconomic status indicators and life-cycle factors (Kasarda & Janowitz, 1974; Sampson, 1988; Sampson, 1991).

This thesis uses length of residency to analyze the mediating effects of income on health. Sampson (1988; 1991) does mention one potential flaw with using length of residency as an indicator of social cohesion without considering residential stability. Residential stability refers to a neighbourhood where the same people occupy the majority of residences for long periods of time. In other words, there are low-levels of

¹⁴ These community studies conceptualize social cohesion as community attachment (e.g., sense of community) (Bolan, 1997).

in-and-out migration to that neighbourhood (Sampson 1988; 1991). The stability of the neighbourhood is important because an individual may live in the same residence for five years but may never form friendship ties or engage civically in the community due to high residential instability in the neighbourhood. It is hard to forge friendly relations with neighbours who are continuously moving in and out of the neighbourhood.

This thesis cannot account for residential stability because the thesis is an individual-level analysis and the data are not aggregated to the community-level. An individual-level analysis is preferred due to the following rationale: typically social capital is conceptualized at the level of communities, that is, individual traits are aggregated to the level of communities. Following the argument put forth by Brehm and Rahn (1997: 1002-03), these indicators of social capital should be present at the individual level of analysis—it is not the ‘community’ that participates in organizations or has feelings of trust but the ‘individuals’ who make up these communities.

Section 1.9 - Research Questions

In order to provide a more comprehensive test of Wilkinson’s theory, this thesis addresses the following research questions: (1) *does income, education, or SES have a greater direct effect on health status?* This determines whether income, education, or SES will be the independent variable for the subsequent data analyses. This research question empirically tests evidence to Wilkinson’s treatise that income inequality, rather than absolute income, is a better correlate of health outcomes. Based on existing health literature (Townsend et al., 1992; Evans, 1994), SES would be expected to explain more of the variance in health than income and education alone. However, considering the debate in the social determinants of health literature (e.g., materialist/neo-materialist vs.

social comparison approach to health), income over SES would be expected to explain more of the variance in health. (2) *What types of social cohesion mediate the relationship between income and health?* This question examines the forms of social cohesion that act as mediators and the forms of social cohesion that are more significant in mediating the relationship between income and health than others. This assesses whether Wilkinson is correct in his assumptions that social capital levels are the most significant in determining health outcomes. Based on the overwhelming literature on the benefits of emotional and instrumental support on health (Cobb, 1976; Corin, 1994) and the contradictory evidence on the positive effects of social capital on health (Woolcock, 1998; Macinko & Starfield, 2001), it was predicted that individual-level forms of social cohesion (e.g., social support) are stronger mediators on the income and health relationship than the community-level indicators. (3) *Are community psychosocial social cohesion indicators and length of residency more highly correlated, than social inequality indicators, with social capital levels and community behavioural social cohesion levels?* This question offers an alternative explanation to why there are varying levels of social capital and CBSC in a community.

Chapter 2 – Methods and Methodology

Section 2.0 – Introduction

Section 2.1 begins the methodology chosen for the thesis and the subsequent benefits and drawbacks of this approach. Section 2.2 discusses the data chosen for the analyses. Section 2.3 describes the variables used in the analyses. Section 2.4 describes the analyses pursued in this thesis.

Section 2.1 – Methodology Chosen for Thesis

The methodology chosen for this thesis is secondary data analysis using quantitative survey data. There are several benefits and drawbacks to this choice of methodology. The advantages of conducting secondary data analysis are that it is cheaper and faster than conducting an analysis on a data set one collects oneself (Babbie, 1998: 275). It costs much money and time to gather data and record it into data sets whether the form of collection is survey or interview. Using pre-existing data saves time as questions used in the surveys are already determined and do not have to be found and tested for validity and reliability.

However, there is a drawback to having survey questions already chosen. The researcher's thesis becomes bound by those questions. For example, questions that measure the rates of alternative forms of civic participation would have been preferred in addition to the questions examined in this thesis. The social capital literature tends to focus on measures of formal groups and associations as indicators of civic participation and subsequently excludes all other forms of civic participation. To achieve robustness in the concept of civic participation, alternative forms of political resistance should be included. Examples would include, union membership, consumer boycotts (the

respondent's refusal to purchase certain commodities or brands), participation in protests, and political discussions outside the rubric of a formalized institution.

It has been further noted by Muntaner, Oates, & Lynch (1999) that these alternative forms of civic participation tend to be left out of surveys which fail to provide the researcher with a well-rounded understanding of an individual's political involvement. Muntaner et al., (1999) suggest there is an inherent bias found in research that frames survey questions with a language characteristic of a middle-upper income view of life. For example, failing to include questions that represent lower-income forms of political involvement implies that for an individual to be participating in public life they must be a member of a formal group. Reliance on formal groups and organizations removes the possibility of informal political gatherings as forms of social capital and gives a false indication that low-income earners have low levels of social capital.

Secondary data analyses does not allow for further inquiry into the data. It prevents contextualizing what the numbers reveal, whereas a mixed-method approach would provide additional discussion of the thesis' subject matter. For example, conducting semi-structured interviews with a sample of respondents would help determine answers to questions that are not presented in the survey, such as the alternative forms of civic participation (mentioned above). This additional research strategy could reveal other forms of social cohesion that may not be considered through the survey questionnaire. For example, Berkman (2000) mentions that when examining social support networks in the community, extended ties are the hardest to pinpoint without questioning people directly about their neighbourhood social relationships. Berkman (2000) illustrates with an example of the grocery store owner as a potential

indicator of community-level social support. A respondent may visit a grocery store regularly and through these many visits the grocery store owner may come to know the respondent well. On occasion, this grocery store owner may provide the respondent with neighbourhood advice or grocery store items at half price; it is these people who provide social support that are hard to capture in survey data.

Additional disadvantages of a secondary data analysis revolve around the questions of validity (e.g., unbiased interviewing techniques) and accuracy (Babbie, 1998: 275). The secondary data researcher must assume validity and accuracy, as she is not the one who conducted the primary research. Nevertheless, in this thesis, secondary data analysis is a legitimate choice of methodology as there are sufficient and credible data on the questions of interest.

Section 2.2 - Data

The data set was obtained from the CAHR-Victoria Baseline Survey (also known as the Promoting Action Towards Health [PATH] survey). The PATH project is a part of the Canadian Institutes for Health Research [CIHR]-funded “Best Practices for Coordinated Health Promotion and Health Services in Midlife.” Data for this survey were collected primarily to study strategies for promoting healthy lifestyles and environments to combat chronic diseases in the community, primarily diabetes. In addition, the data are to help understand the links between community participation, social support, lifestyles, coping resources, and health. Data for the PATH baseline survey were collected in Victoria, BC, in a residential area known as ‘the Quadra-Hillside Area,’ a relatively disadvantaged area in comparison to the rest of Victoria. The data to be used here were collected in face-to-face interviews based on a structured

questionnaire, between October 2001 and June 2002. The total number of interviews was N=918. The sample was 40% male and 60% female. Ages ranged from 35-64 years with an average age of 48 years. The average annual household income was between \$35,000 and \$40,000. There were 115 questions in the baseline survey, the majority of them closed-ended. Major areas of the study included: demographics, health beliefs/health status, psychosocial coping resources, and community participation and service use.

Section 2.3 –Variables used for the Analyses

This portion of the chapter focuses on variables used for the secondary data analyses. The dependent variable, health; the independent variables, income, education, and SES; and the mediating variables emotional support, instrumental support; community-level indicators [further sub-divided into three groups: (i) social capital; (ii) community behavioural social cohesion (CBSC), and; (iii) community psychosocial social cohesion (CPSC)] and; the control variables, demographic factors, psychological factors, lifestyle factors, perceived stress, and length of residency.

2.3.a Dependent Variable – Health Status

The dependent variable, health status, includes four components; (1) physical health, (2) emotional health, (3) general perceived health, and (4) chronic conditions. The first three domains are measured using the 36-item short form (SF-36) and the fourth domain was measured with a constructed variable created for the PATH project. Physical health is measured using two scales; (i) Physical functioning, and (ii) Role limitations due to physical health. Emotional health is assessed using two scales; (i) General mental health, and (ii) Role limitations due to emotional health.

Domains (1) to (3) were adopted from the SF-36, which was originally constructed as part of the Medical Outcomes Study (MOS) to survey health status (Ware & Sherbourne, 1992). The SF-36 is a self-administered 36-item questionnaire, designed to be used in clinical practice and research, health policy evaluations, and general population surveys. The SF-36 measures eight domains of health; (1) physical functioning; (2) role limitations because of physical health problems; (3) social functioning; (4) bodily pain; (5) general mental health (psychological distress and well-being); (6) role limitations because of emotional problems; (7) vitality (energy and fatigue); and (8) general health perceptions (Ware & Sherbourne, 1992).

All are designed so that the higher the score the better the health status. *Physical functioning* uses a three-point scale: (1) yes, a lot; (2) yes, a little; and (3) no. *Role limitations due to physical health* uses a two-point scale: (1) yes; and (2) no. *General mental health* uses a six-point scale: (1) all of the time; (2) most of the time; (3) a good bit of the time; (4) some of the time; (5) a little of the time; and (6) none of the time. *Role limitations due to emotional health* uses a two-point scale: (1) yes; and (2) no. *General health perceptions* uses a five-point scale for four out of the five questions asked: (1) definitely true; (2) mostly true; (3) don't know; (4) mostly false; and (5) definitely false. For the question "in general would you say your health is...", a four-point scale was used: (1) fair; (2) good; (3) very good; and (4) excellent. This measure of health utilizes a scale that does not include 'poor' because middle-aged respondents seldom report their health as poor (Menec & Chipperfield, 2001). Questions are summed together to create the scale score. The following summed scales are (1) physical function (Cronbach's Alpha=0.92), (2) role limitations due to physical health (Cronbach's

Alpha=0.91), (3) mental health (Cronbach's Alpha=0.84), (4) role limitations due to emotional health (Cronbach's Alpha=0.84), and (5) general perceived health (Cronbach's Alpha=0.81).

(1) Physical Health:

(i) Physical Functioning

“The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?”

1. Vigorous activities, such as running, lifting heavy objects
2. Moderate activities, such as moving a table, playing golf
3. Lifting or carrying groceries
4. Climbing one flight of stairs
5. Climbing several flights of stairs
6. Bending, kneeling, stooping
7. Walking one block
8. Walking several blocks
9. Walking more than a mile
10. Bathing/showering or dressing yourself

(ii) Role limitations due to physical health

“During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?”

1. Cut down the amount of time you spent on work or other activities
2. Accomplished less than you would like
3. Were limited in the kind of work or other activities you did
4. Had difficulty performing the work or other activities (for example, it took extra effort)

(2) Emotional Health:

(i) General Mental Health

“These questions are about how you feel and about how things have been with you during the past four weeks. For each question, please give the one answer that comes

closest to the way you have been feeling. How much of the time during the past four weeks...”

1. Have you been a very nervous person
2. Have you felt so down in the dumps that nothing could cheer you up
3. Have you felt calm and peaceful (reversed)
4. Have you felt downhearted and blue
5. Have you been a happy person (reversed)

(ii) Role limitations due to emotional health

“During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?”

1. Cut down the amount of time you spent on work or other activities
2. Accomplished less than you would like
3. Did not do work or other activities as carefully as usual

(3) General Perceived Health:

1. “In general, would you say that your health is”

“How true or false is each of the following statements, for you:”

2. I seem to get sick a little easier than other people
3. I am as healthy as anybody I know (reversed)
4. I expect my health to get worse
5. My health is excellent (reversed)

(4) Number of Chronic Conditions:

This variable was constructed for the PATH project and is not considered part of the SF-36 questionnaire. This variable sums the number of chronic conditions the respondent has and creates an ordinal variable. Thus, the variable of chronic conditions does not distinguish by type of condition but by how many chronic conditions the respondent has. The following is the question asked in the PATH survey and the types of chronic conditions the respondent could choose from.

“I am going to read a list of long-term, chronic health problems or conditions, and for each, please tell me if a health professional has said you have it.” The chronic conditions listed to the respondent were:

Food allergies or other allergies [39.4%]
 Asthma [12.9%]
 Back problems (excluding arthritis) [37.0%]
 High blood pressure [14.1%]
 Migraine headaches [15.9%]
 Chronic bronchitis or emphysema [6.8%]
 Sinusitis [11.9%]
 Stomach or intestinal ulcers [7.0%]
 Heart disease, Hepatitis (B or C) [4.9%]
 HIV/AIDS [3.2%]
 Mental health condition (e.g., depression) [6.8%]
 Digestive disorders [4.9%]
 Thyroid [3.3%]
 Arthritis [7.1%]
 Other [22.6%]
 Diabetes [4.1%]

The respondent had a choice of answering yes/no to each chronic condition. This created a variable ranging in values from 0-10. Each number (0-10) corresponded with the number of chronic conditions the respondent had.

0 chronic conditions [0.0%]	1 chronic condition [31.4%]
2 chronic conditions [30.1%]	3 chronic conditions [18.7%]
4 chronic conditions [10.9%]	5 chronic conditions [5.3%]
6 chronic conditions [2.3%]	7 chronic conditions [0.5%]
8 chronic conditions [0.4%]	9 chronic conditions [0.2%]
10 chronic conditions [0.1%]	

2.3.b - Independent Variables

The independent variables used in this thesis included education, income, and SES. To measure SES, the education and income variable were combined.

(1) Education:

“What is the highest level of education you have completed?”

1. Grade 8 or lower, Grade 9-10, and Grade 11-13 (including GED) [36.5%]
2. Diploma, degree or certificate in progress, not yet completed & Trades certificate, vocational school diploma, apprenticeship [12.6%]
3. Non-university certificate or diploma from a community college, etc. & University certificate below Bachelor's degree [23.7%]
4. Bachelor's degree & University degree, certificate or diploma above Bachelor's degree [27.1%]

(2) Objective Income:

“What is your best estimate of the total income, before taxes and deduction of all household members from all sources in the last year?”

1. No Income - \$19,999 [24.3%]
2. \$20,000-\$39,999 [27.3%]
3. \$40,000-\$59,999 [22.3%]
4. \$60,000 and over [26.1%]

(3) Socioeconomic Status:

This is a created variable using the above-mentioned variables, income and education.

- (1) Low SES: (i) High school or less & less than \$20,000 [10.6%]
- (2) Upper-Low SES: (i) Vocational or not completed degree & less than \$20,000, and; (ii) High school or less & \$20,000-\$39,999 [15.6%]
- (3) Lower-Medium SES: (i) College or university certificate & less than \$20,000; (ii) Vocational or not completed degree & \$20,000-\$39,999, and; (iii) High school or less & \$40,000-\$59,999 [15.1%]
- (4) Medium SES: (i) Undergraduate degree or higher & less than \$20,000; (ii) College or university certificate & \$20,000-\$39,999; (iii) Vocational or not completed degree & \$40,000-\$59,999, and; (iv) High school or less & \$60,000 or higher [20.0%]
- (5) Upper-Medium SES: (i) Undergraduate degree or higher & \$20,000-\$39,999; (ii) College or university certificate & \$40,000-\$59,999, and; (iii) Vocational or not completed degree & \$60,000 or higher [15.2%]
- (6) Lower-High SES: (i) Undergraduate degree or higher & \$40,000-\$59,999, and; College or university certificate & \$60,000 or higher [12.5%]
- (7) High SES: (i) Undergraduate degree or higher & \$60,000 or higher [11.1%]

2.3.c - Mediating Variables

Social cohesion variables were divided into the following three categories: (1) emotional; (2) instrumental, and: (3) community-level.

(1) Emotional Social Support

(i) Emotional Support:

Questions used in the *Perceived Emotional Support Scale* included:

1. There is no one who really understands what you are going through;
2. The people close to you let you know that they care about you (reversed);
3. There are not many people around you that help you keep your spirits up;
4. There are people in your life that make you feel good about yourself (reversed);
5. You have a friend or relative in whose opinion you have confidence (reversed);
6. There are few people around you that you feel you can trust;
7. You have at least one friend or relative you can really confide in (reversed).

This *perceived emotional support* scale is a modification of Pearlin et al.'s (1990) *expressive support scale*. The original expressive support scale is an eight-item scale that measures the "perceived availability of a person who is caring, trustworthy, uplifting, and a confidant" (Pearlin et al., 1990: 590). The expressive support scale uses a four-point response scale (1=strongly agree, 2=agree, 3=disagree, and 4=strongly disagree). The modified perceived emotional support scale has seven-items and the same four-point response scale. The seven-items are summed together and divided by the total number of items to create the scale score. The eighth-item removed was the question "you have at least one friend or relative you want to be with when you are feeling down or discouraged." The PATH project researchers removed the eighth item, as the item was determined not to contribute any valuable additional information to the emotional support scale. Results of the perceived emotional support scale have been summed. The scale

range is seven to 28, and higher scores indicate a greater likelihood of the respondent having perceived emotional support (Cronbach's Alpha=0.80).

(ii) Emotional Network:

The question used for this variable was, "would you say you have close friends? About how many?"

1. None – respondent has no close friends [5.3%]
2. 1 or 2 – respondent has one or two close friends [19.5%]
3. 3 to 6 – respondent has 3 to 6 close friends [51.9%]
4. 7 to 10 – respondent has 7 to 10 close friends [13.4%]
5. > 10 – respondent has more than 10 close friends [10.0%]

This variable ranges in responses from 0 to 95. A five-category variable was created to present a normal distribution.

(2) Instrumental Social Support

(i) Instrumental Support:

Questions used for the *Perceived Instrumental Support Scale* are as follows:

1. If you needed a loan, there are people that would help you out (reversed);
2. There are friends or relatives you could stay with if you ran into difficulty (reversed);
3. Your friends or relatives would probably not take care of you if your health were bad;
4. If you were ill and needed a ride to the doctor, there are few people close to you that you could count on;
5. You can go to your friends or relatives for advice or information when you have to make a difficult decision (reversed), and;
6. There are not many people in your life that you could borrow things from, if you needed to.

This *perceived instrumental support scale* was created for the PATH project, based on Macdonald's (1998) *scales of perceived social support*. Macdonald's (1998) *scales of perceived social support* measure four areas of social support: (1) emotional support; (2) appraisal support; (3) informational support; (4) instrumental support (565). The original

scales of perceived social support measure the “perceptions of support received from one’s network of family or friends” (Macdonald, 1998: 573) and consist of 56-items scored on a 5-point Likert scale. The *perceived instrumental support scale* used for the PATH project was shortened to create a measure of instrumental forms of social support as opposed to emotional forms of social support. The *perceived instrumental support scale* consists of 6-items and is scored on a 4-point scale (1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree). The scale range is 6 to 24; higher scores indicate a greater likelihood of the respondent having perceived instrumental support (Cronbach’s Alpha=0.80).

(3) Community-level Social Cohesion – (I) Social Capital, (II) Community behavioural social cohesion, (III) Community psychosocial social cohesion

Social capital variables were chosen based on the similarity to those used by Wilkinson (1996) and included both formal group membership and interpersonal trust. CBSC variables reflected an individual’s social interactions in her/his community. CPSC variables measured an individual’s perception of the community in which s/he lives.

(I) Social Capital

(i) Formal Groups:

“Are you a member of any voluntary organizations or formal associations such as school groups, community centres, church social groups, ethnic associations, sports leagues, blockwatch, or women’s groups?”

1. No [50.7%]
2. Yes [49.3%]

(ii) Interpersonal trust:

“There are few people around you that you feel you can trust.”

- 1 Strongly agree [6.7%]
- 2 Agree [20.8%]
- 3 Disagree [38.5%]
- 4 Strongly Disagree [24.0 %]

(II) Community Behavioural Social Cohesion

(i) Community Activities:

“In the last year, have you ever organized or participated in any of the following community activities?” The community activities read to the respondent were:

- Boy Scouts/Girl Guides [6.0%]
- Church Fundraisers [12.5%]
- Church/Community Suppers [19.4%]
- Fundraiser Bingo [7.5%]
- Fundraiser runs or dances [20.0%]
- Parent Advisory Committee [10.9%]
- Out-Trips/Field Trips [25.2%]
- Political Campaigns [8.8%]
- Block Parties/Clubs [15.6%]
- Community Groups (e.g. Friends of Summit Park) [17.1%]
- Rummage/Yard Sales [29.5%]
- Neighbourhood Organizations (e.g. Neighbourhood Action Group) [15.7%]
- School activities [29.0%]
- Community Events (e.g. Folkfest, opening of Quadra Village) [48.5%]
- Annual General Meetings of community groups (i.e., BCC) [26.8%]

The variable created from this question measured how many community activities the respondent attended as opposed to which type of community activities the respondent attended. Based on the distribution of responses, a four-category ordinal variable was created to represent the different levels of attendance the respondent had in the community.

- None – the respondent attended 0 community activities [22.4%]
- Low – the respondent attended 1-2 community activities [29.9%]
- Medium – the respondent attended 3-5 community activities [30.5%]
- High – the respondent attended 6-13 or more community activities [17.2%]

(ii) Informal Groups:

“Do you consider yourself a member of any informal groups such as card groups, book clubs, regular coffee get-togethers, or casual gym or pool groups?”

1. No [59.9%]
2. Yes [40.1%]

(III) Community Psychosocial Social Cohesion**(i) Sense of belonging to neighbourhood:**

“How would you describe your sense of belonging to your neighbourhood?”

1. Very weak [15.5%]
2. Somewhat weak [31.6%]
3. Somewhat strong [41.2%]
4. Very strong [11.6%]

(ii) Trust Neighbours:

“Generally, do you trust your neighbours to look out for you (and your family)?”

1. No [20.0%]
2. Yes [80.0%]

(iii) Desire to be involved:

“Thinking generally, how would you rate your own desire to be involved in making changes in your neighbourhood?”

1. Not willing [9.6%]
2. Somewhat not willing [18.2%]
3. Somewhat willing [55.1%]
4. Very willing [17.1%]

(iv) Fear of Crime:

“How safe do you feel from crime in your neighbourhood, generally?”

1. Very unsafe [8.3%]
2. Somewhat safe [21.5%]
3. Reasonably safe [50.2%]
4. Very safe [20.0%]

(v) Healthy Community:

“How healthy would you rate your neighbourhood as a place to live?”

1. Very unhealthy [6.5%]
2. Somewhat unhealthy [16.8%]
3. Somewhat healthy [57.2%]
4. Very healthy [19.6%]

(vi) Neighbouring:

“How many neighbours do you know?”

0. None – respondent knows/recognizes none of his/her neighbours [10.8%]
1. 1 or 2 – respondent knows/recognizes 1 or 2 of his/her neighbours [15.7%]
2. 3 to 6 – respondent knows/recognizes 3 to 6 of his/her neighbours [29.5%]
3. 7 to 10 – respondent knows/recognizes 7 to 10 of his/her neighbours [17.2%]
4. Many – respondent knows/recognizes more than 10 of his/her neighbours [26.8%]

This variable is recorded as people in the neighbourhood you recognize by face not necessarily people you talk to. The assumption is that the greater the number of neighbours you know the greater your extended community ties. The variable had a range of responses from 0 to 500. Based on the distribution of responses, the variable was recoded into a 5-category variable with a relatively even frequency distribution.

2.3.d - Control Variables

The control variables used in the secondary data analysis included the following categories: (1) demographic factors; (2) psychological factors; (3) lifestyle factors; (4) perceived stress, and; (5) length of residency.

(1) Demographic Factors

(i) Sex:

- 0. Male [40.1%]
- 1. Female [59.9%]

(ii) Age:

Age was a continuous variable ranging from age 35 to 65, with an even distribution of respondents across the age spectrum.

(2) Psychological Factors

(i) Self-efficacy:

Self-efficacy Scale:

Questions used in the self-efficacy scale included:

1. You can always manage to solve difficult problems if you try hard enough;
2. If someone opposes you, you can find the ways and means to get what you want;
3. you find it hard to stick to your aims and accomplish your goals (reversed);
4. You are confident that you could deal efficiently with unexpected events;
5. Thanks to your resourcefulness, you know how to handle unforeseen situations;
6. You can solve most problems if you invest the necessary effort;
7. You can remain calm when facing difficulties because you can rely on your coping abilities;
8. When you are confronted with a problem, you can usually find several solutions;
9. If you are in trouble, you often find it hard to think of a good solution (reversed);
10. You have difficulties dealing with whatever comes your way (reversed).

This self-efficacy scale is based on Jerusalem and Schwarzer's (1992) *generalized perceived self-efficacy scale*. The generalized perceived self-efficacy scale is a 10-item scale that measures optimistic self-belief; the "belief that one can perform a novel or difficult task, or cope with adversity – in various domains of human functioning" (Jerusalem & Schwarzer, 2003: 1). This scale differs from other self-efficacy scales because it emphasizes individual agency when assessing optimistic beliefs; individual actions are responsible for positive outcomes (Jerusalem & Schwarzer, 1992). This scale

uses a 4-point scale (1=not at all true, 2=barely true, 3=moderately true, 4=exactly true).

Scale ranges from 10 to 40, and higher scores indicate a higher self-efficacy rating for the respondent (Cronbach's Alpha=0.81).

(ii) Internal health locus of control:

Internal Health Locus of control [IHLC]:

Questions used in the *Internal Health Locus of Control Scale* included:

1. If I get sick, I have the power to make myself well again;
2. I am directly responsible for my health;
3. Whatever goes wrong with my health is my own fault;
4. My physical wellbeing depends on how well I take care of myself;
5. When I feel ill, I know it is because I have not been taking care of myself properly;
6. I can pretty much stay healthy by taking good care of myself.

The *Internal Health Locus of Control [IHLC] scale* was adopted from Wallston et al.'s (1978) *Multidimensional Health Locus of Control [MHLC] Scales*. The MHLC scales consisted of three scales which aimed to identify the source of an individual's health-related behaviours. First, the *IHLC scale*, measures the extent to which the respondent's health beliefs are due to their own behaviour (Wallston et al., 1978). Second, the *Powerful Others Health Locus of Control [PHLC] scale*, measures the extent to which the respondent believes her/his health is determined by powerful others, for example, health professionals (Wallston et al., 1978). Third, the *Chance Health Locus of Control [CHLC] scale*, measures the extent to which the respondent believes s/he is healthy due to chance, fate, or luck (Wallston et al., 1978). In the PATH project only the IHLC scale was utilized. The IHLC scale consists of 6-items scored on a 6-point scale (1=strongly disagree to 6=strongly agree). The Scale ranges from 6 to 36, and the higher the score

the more likely it is that the respondent believes that their health is due to their own behaviour (Cronbach's Alpha=0.79).

(3) Lifestyle Factors

(i) Exercise:

The question used for this variable was, "On average, how often do you do vigorous (sweat and/or breathe heavily) physical activities, such as brisk walking for at least half an hour, running, or playing team sports?" The variable was recoded into the following dichotomous variable:

- 0. Low activity level [27.9%]
- 1. High activity level [72.1%]

Due to the skewed distribution, low activity level was defined as an individual who was not active at all to an individual who was active once or twice a month. High activity level was defined as an individual who was active once or twice a week to an individual who was active daily.

(ii) Healthy Eating:

The question used for this variable was, "How healthy do you think your eating habits are at the current time?" The variable was recoded into the following dichotomous variable:

- 0. Unhealthy eating [45.6%]
- 1. Healthy eating [54.4%]

Due to the skewed distribution, unhealthy eating was defined as respondents who answered extremely unhealthy to fairly healthy to the above-mentioned question. Healthy eating was defined as respondents who answered mostly healthy and extremely healthy to the above-mentioned question.

(iii) Fruits/Veggies:

The question used for this variable was, "On how many days in the last week did you have five or more servings of fruits and vegetables in one day?" The variable was recoded into the following dichotomous variable:

- 0. Low fruit/veggie consumption [51.1%]
- 1. High fruit/veggie consumption [48.8%]

Due to the skewed distribution, low fruit/veggie consumption was defined as an individual who had 5 servings of fruits/veggies 0 to 4 times a week. High fruit/veggie consumption was defined as an individual who had 5 servings of fruits/veggies 5 to 7 times a week.

(iv) High Fat:

The question used for this variable was, "On how many of the last seven days did you eat high fat foods like hamburgers or full-fat dairy products?" The variable was recoded into the following dichotomous variable:

- 0. High fatty food consumption [51.1%]
- 1. Low fatty food consumption [48.9%]

Due to the skewed distribution, high fatty food consumption was defined as an individual who had fatty foods (e.g., trans fats) 2 to 7 days a week. Low fatty food consumption was defined as an individual who had fatty foods 0 to 1 time a week.

(v) Alcohol:

The question used for this variable was, "About how often do you drink alcoholic beverages?" The variable was recoded into the following dichotomous variable:

- 0. High alcohol consumption [38.7%]
- 1. Low alcohol consumption [61.3%]

Due to the skewed distribution, high alcohol consumption was defined as an individual who consumed alcohol once a week to every day. Low alcohol consumption was defined as an individual who consumed alcohol 2 to 3 times a month to not at all.

(vi) Smoking:

The question used for this variable was, "At the present time, do you smoke daily, occasionally or not at all?" The variable was recoded into the following dichotomous variable:

- 0. Active smoker [26.3%]
- 1. Non-smoker [73.7%]

Due to the skewed distribution, an active smoker was defined as an individual who smokes on a daily basis or occasionally. A non-smoker was defined as an individual who does not smoke.

(4) Perceived Stress

(i) Perceived Stress Scale:

Questions used in the *Perceived Stress Scale* are:

1. Have you been upset because of something that happened unexpectedly;
2. Have you felt that you were unable to control the important things in your life;
3. Have you felt nervous and stressed;
4. Have you felt confident about your ability to handle your personal problems (reversed);
5. Have you felt that things were going your way (reversed);
6. Have you found that you could not cope with all the things that you had to do;
7. Have you been able to control irritations in your life (reversed);
8. Have you felt that you were on top of things (reversed);
9. Have you been angered because of things that were outside of your control;
10. Have you felt difficulties were piling up so high you could not overcome them.

This *Perceived Stress Scale* was adopted from Cohen et al.'s (1983) *Perceived Stress Scale* (PSS). The PSS measures the perception of stress, and was designed to assess the degree to which the respondent finds her/his life unpredictable, uncontrollable,

and overloaded (Cohen, 1994). The PSS is a 10-item scale scored on a 5-point response scale (0=never, 1=almost never, 2=sometimes, 3=fairly often, 4=very often). Scale ranges from 10 to 50, and higher scores indicate the likelihood that the respondent has a high level of perceived stress (Cronbach's Alpha=0.88).

(5) Length of Residency

(i) Current Residence:

The question used for this variable was, "How long have you lived in your current residence?" The variable was recoded into the following ordinal variable to create an even distribution:

1. Short-length of time in current residence [33.8%]
2. Medium-length of time in current residence [43.6%]
3. Long-length of time in current residence [22.7%]

Short-length of time is defined as an individual who has lived in their current residence under four years. Medium-length of time is defined as an individual who has lived in their current residence anywhere from four years to less than ten years. Long-length of time is defined as an individual who has lived in their current residence for ten years or longer.

Section 2.4 – Analysis

This section discusses the type of regression used and its assumptions, the type of selection used for the model construction, and each research question, mediator model, and moderator model. This thesis used SPSS¹⁵ 12.0 for Windows to perform the secondary data analyses.

¹⁵ SPSS stands for "Statistical Package for the Social Sciences" (About SPSS Inc., 2006).

Rationale for the use of the OLS Multiple Regression Analysis

This thesis primarily utilizes the ordinary least squares (OLS) multiple regression analyses. Researchers typically use a multiple regression model to determine which of several independent variables (IVs) are considered the best correlate of the dependent variable (DV) (Greenhalgh, 1997). For example, which of the following, income, gender, age, or education, best explains health outcomes? Multiple regression analyses are preferable when the DV is an ordinal variable, as it is in this thesis. It is noted that a bivariate regression analysis is used for the analysis on research question 1, as there is only one IV and DV used. As well, logistic regression is used for portions of research question 3, when the DV is dichotomous (Dallal, 5 June 2004) instead of ordinal. Multiple regression is preferred due to its ability to analyse a relationship while taking into consideration the 'complexity' of everyday life (Cohen & Cohen, 1975). The model can determine the predictability of the IV on the outcome, while controlling for the multiplicity of factors, which may influence the relationship. For example, multiple regression can analyse the function of income on health while taking into account the effects of demographic, psychological, and lifestyle factors.

The Assumptions of a Linear Regression

There are three main assumptions the data must meet in order for a linear regression analysis to yield meaningful results: linearity, normality, and homogeneity of variance (e.g., homoscedasticity). All data were tested for these assumptions before analyses were run.

Linearity

Linearity was tested using eta, the correlation ratio. Eta is a coefficient of nonlinearity (Siegel, 1956). If a relationship is linear, eta will equal the correlation coefficient (Pearson's r). The amount eta exceeds r , is how much the relationship deviates from a linear association. All data met the assumption of linearity.

Normality

The assumption of normality is achieved when the regression falls along a normal distribution about its mean. Normality is typically a concern for sample sizes below 30 and tends to be assumed with larger sample sizes (Agresti & Finlay, 1997). Normality may be a problem with distributions that are heavily skewed or asymmetrical (Levin & Fox, 1994).

Normality was tested using the Kolmogorov-Smirnov test. If normality is met the Kolmogorov-Smirnov statistic will not be significant. If the Kolmogorov-Smirnov statistic was found to be significant, a histogram was run to check for deviations from normality. In instances where skewness is a problem, variables can be transformed or collapsed to meet the assumption of normality used in this thesis. In cases of slight skewness variables can be transformed using the following transformations. For distributions that are right positively skewed, the DV can be transformed using the logarithm, square-root, or inverse, to correct the degree of skewness. Typically, inverse, logarithmic, and square-root transformations are used to correct skewness for large, medium, and small skewed distributions respectively (Cohen, 1969). In cases where distributions are left negatively skewed, distributions are first reversed by subtracting all values of the DV by the highest DV value plus one. Reversing the distribution to create a

right positively skewed distribution allows for the inverse, logarithmic, and square-root transformations to be applied to the DV.

The data were also checked for multicollinearity. Multicollinearity is present when IVs overlap in the variance explained in the DV because multivariate regression analysis reveals only variance uniquely impacting the DV. Multicollinearity was checked by viewing the Tolerance levels in the SPSS output. Tolerance levels exist on a scale of .0 to 1.0, multicollinearity is understood to be a problem if the Tolerance levels are around .1 (Menard, 1995). The groups of social cohesion variables were included in separate regressions due to multicollinearity. Interpersonal trust, one of the social capital variables, was also present in the perceived emotional support scale. Therefore, due to multicollinearity, they could not be run together. All other data met the assumption of normality.

Homogeneity of Variance (homoscedasticity)

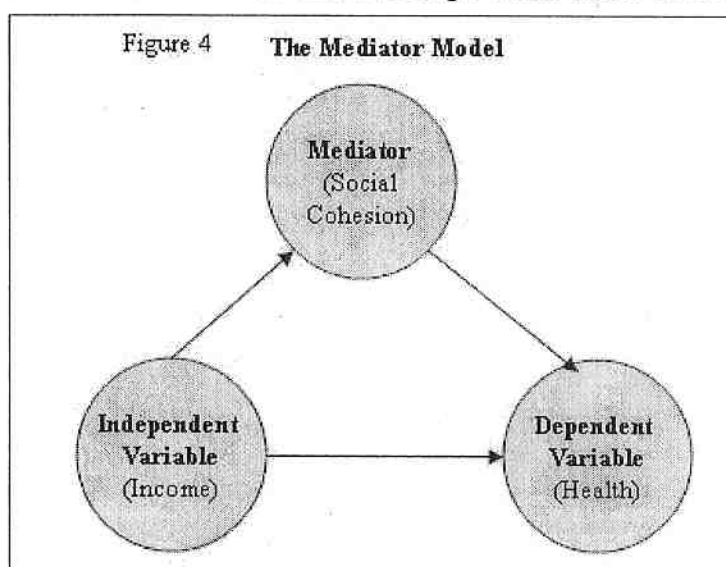
Homogeneity of variance or homoscedasticity is a “condition in which the variance of two or more population distributions are equal” (Bohrnstedt & Knoke, 1988: 233). Homogeneity of variance was tested using the Brown-Forsythe test, which is a robust measure used to estimate if two groups are homoscedastic (Brown & Forsythe, 1974). If the Brown-Forsythe statistic is found to be not significant at the $p < .05$ level of significance, the assumption of homogeneity of variance is met. All data met the assumption of homogeneity of variances.

The Rationale for the Type of Variable Selection Used

This thesis primarily uses simultaneous selection for the secondary data analyses. Simultaneous selection is appropriate as the theoretical basis to ordering the IVs into the statistical model is limited (Cohen & Cohen, 1975). For example, the first block entered into the regression is the income variable, the second block entered is the control variables, and the third block entered is the social cohesion block. However, there is no theory guiding the order of the control variables; thus, all control variables are entered simultaneously. Although this thesis has theory guiding the inclusion of the blocks of variables, there is no way to know for sure how to order the variables within these blocks. When in doubt about how to order variables, some statisticians (Brace et al., 2000) advise the use simultaneous selection. As well, it has been noted by Baron & Kenny (1986) that when testing for mediating effects simultaneous variable selection is acceptable.

The Mediating Model

A mediator (refer to Figure 4) is understood as a mechanism through which the IV affects the DV (Morano, 2003). For a mediator to be present, the following four criteria must be met: first, the IV must be significantly related to the mediator; second, the IV must be significantly related to the DV; third, the mediator must be significantly related to the DV; and, fourth, the impact of the IV on the DV is



less when the mediator is controlled for (Holmbeck, 1997: 602). The first criterion is discussed in the analysis for research question 3. The second criterion is discussed in the analysis for research question 1. The third and fourth criterion are discussed in the analysis for research question 2.

Analysis for Research Question 1

Research question 1, *does income, education or SES have a greater direct effect on health status* is examined by using a bivariate regression analysis. All six measures of health were run as separate DVs to determine the respective effects that the IVs have on health. This determines the strength of the relationship; how much of the variance of health is accounted for by each IV. Squaring the Beta standardized coefficient provides the percentage of variance that the IV has explained in the DV. The comparison of the three squared Betas determines which IV accounts for the greatest variation in health status. The IV¹⁶ that explains most of the variance in health is used in subsequent analyses in lieu of IVs found to have weaker effects on health.

In addition to the bivariate regression analyses, crosstabulation procedures were used to visually scan for non-linear relationships; thus, assessing Wilkinson's argument that significant differences in health occur at all points along the status continuum. DVs were dichotomized for this purpose. The following table describes the dichotomous health variables created for the crosstabulations:

¹⁶ For sake of continuity, from herein the independent variable is referred to as income.

Table 1: Dichotomous Health Variables Created for Crosstabulations

Health Variable	Poor Health		Good Health	
	Value Range	Valid %	Value Range	Valid %
Physical Functioning	0-90	41.2	95-100	58.8
RLPH	0-75	40.0	100	60.0
Emotional Health	24-92	47.9	0-20	52.1
RLEH	0-600	32.4	900	67.6
GPH	5-65	36.1	70-100	63.9
CC	3-10	38.6	1-2	61.4

Analysis for Research Question 2

The second research question, *what different types of social cohesion play a mediating role in the relationship between income and health*, is analyzed using multivariate regression analyses. Model 2 adds to the bivariate analyses performed in Model 1 by including the following control variables: demographic factors (age and gender), psychological factors (self-efficacy, internal health locus of control), lifestyle factors (smoking, drinking, healthy eating, and exercise), and perceived stress.

Model 3 adds the five separate social cohesion groups (Wilkinson's social capital, emotional support, instrumental support, CBSC, and CPSC) to Model 2. Each social cohesion group was added separately to Model 2, due to multicollinearity, and then compared. As each social cohesion group was added separately, there were five subsets of Model 3, each corresponding to the specific social cohesion group. The five subsets of Model 3 determine whether Wilkinson's social capital variables explain a greater proportion of the variance of health than the other social cohesion variables. This is ascertained by viewing the squared Betas and significance levels.

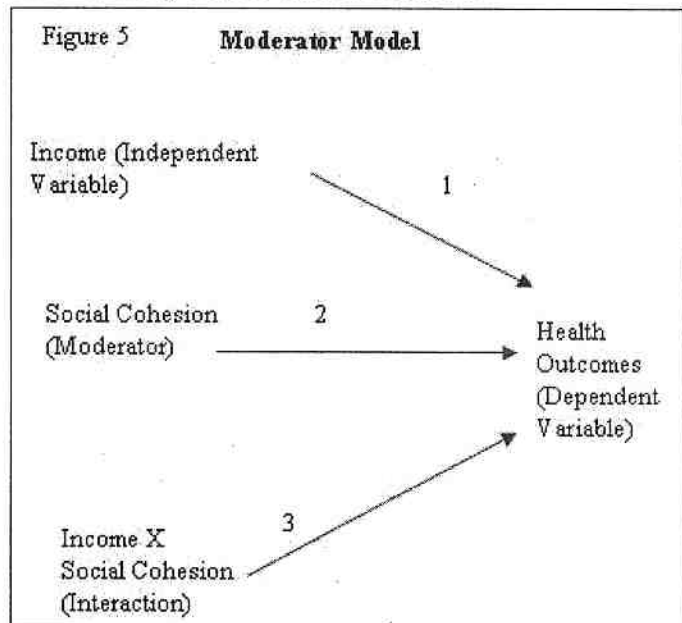
In addition, Model 3 determines which, if any, social cohesion variables act as mediators in the relationship between income and health. To determine if a mediating effect is present, the social cohesion Beta must be significant when placed as a correlate

of the DV (health). This is determined by comparing the income Beta values in Models 2 and 3. If the income Beta value in Model 3 is lower than in Model 2, this indicates the presence of a mediator. For example, a partial mediation is present when the income Beta value is reduced from its value in Model 2 but not to a level of insignificance (Morano, 2003). Furthermore, a full mediation is present when the income Beta value is reduced to a level of insignificance (Morano, 2003). On the other hand, if the income Beta value does not change or increases between models, there is no mediating effect produced. The underlying logic is that a mediator reduces the negative impact that income has on health outcomes (Baron & Kenny, 1986).

The Moderator Model

Most of the stress literature that examines the buffering effects of social support on the stress and health relationship considers the moderation model (Quittner et al., 1990). A moderator (refer to Figure 5) is defined as “a variable that affects the direction and/or strength of the relation between an independent variable and a

dependent...variable” (Baron & Kenny, 1986: 1174). A moderating effect is demonstrated by the presence of an interaction between the independent variable and the hypothetical moderator, tested after the inclusion of the main effects of the independent variable and moderator in the multiple regression model



(Morano, 2003). Using the example of income (IV) and social support (moderator), a moderating effect suggests that the impact social support has on health outcomes may vary depending on the level of income.

Analysis for Research Question 3

To assess the third research question, *are CPSC indicators and length of residency more highly correlated, than social inequality indicators, with social capital and CBSC levels*, multiple regression analyses were conducted. Social cohesion variables found to be significant in research question 2 are analysed as DVs. Second, it determines if social inequality or CPSC indicators are better correlates of CBSC and social capital variables. Separate analyses are run for each DV. DVs that are dichotomous (e.g., formal and informal groups) are analysed using a logistic regression. This research question tests Wilkinson's claim that income predicts social capital. As well, the predictability of other social inequalities in determining social capital levels is determined. For example, gender, and age are used as IVs in the multiple regression analyses. In addition to these social inequalities, the predictability of CPSC measures and length of residency in determining social capital levels is tested. Comparing the significance levels of social inequality, CPSC, and length of residency indicators, helps determine which indicators are better correlates of social capital

Chapter 3 – Results

Section 3.0 – Introduction to Results Chapter

Chapter 3 discusses the results portion of the thesis. This chapter presents the results of the analyses run regarding the three research questions proposed in this thesis. A discussion of these results follows in chapter 4 of the thesis.

Section 3.1 - Does income, education or socioeconomic status have a greater direct effect on health status?

Results of Crosstabulations for Health and Independent Variables Physical Functioning and Education

The crosstabulation for physical functioning and education was not significant at the $p < .001$ level. The crosstabulation was re-run with the following recoded two-category education variable: (1) Low education (high school or less) [36.5%], and; (2) High education ('vocational or not completed degree,' 'college or university certificate,' and 'undergraduate degree or higher') [63.5%], to determine if the two-category education would produce a stronger affect on physical functioning than the four-category education variable.

The crosstabulation between physical functioning and two-category education was significant at the $p < .001$ level of significance (refer to Table 1), showing a strong linear relationship between physical functioning and education. An individual with low levels of education is more likely to have poorer physical functioning when compared to individuals with higher education levels. The two-category education variable was used in the bivariate regression described in the following section.

Physical Function and Income

The crosstabulation for income and physical functioning was significant at the $p < .000$ level (refer to Table 1). The crosstabulation reveals that income and physical function have a clear linear relationship. That is, physical functioning improves as income increases. The biggest difference between contiguous categories occurs between those who have \$0 - \$19,999 annual household income and those who have \$20,000 - \$39,999 annual household income.

Physical Functioning and Socioeconomic Status

The crosstabulation for SES and physical functioning was significant at the $p < .000$ level (refer to Table 1). This crosstabulation shows a more or less linear relationship between physical functioning and SES. Those who have lower levels of SES tend to have poorer physical functioning compared to those with higher SES. The greatest difference between contiguous categories occurs between those who have Low SES and those who have Upper-Low SES to Lower-Medium SES.

Role Limitations due to Physical Health and Education

The crosstabulation for RLPH and education was significant at the $p < .000$ level (refer to Table 2). The crosstabulation showed a linear relationship between RLPH and education. That is, as education levels increase so does the likelihood of an individual experiencing minimal role limitations due to physical health.

Physical Functioning

Table 2: Crosstabulation Results for Physical Functioning and Independent Variables

	Education		Income (\$)				Socioeconomic Status						
	Low	High	0-19,999	20,000-39,999	40,000-59,999	60,000 or higher	Low	Upper-Low	Lower-Medium	Medium	Upper-Medium	Lower-High	High
Poor PF (%)	48.5	36.9	59.9	41.5	32.5	28.6	65.6	48.5	45.7	36.3	30.0	34.6	27.4
Good PF (%)	51.5	63.1	40.1	58.5	67.5	71.4	34.4	51.5	54.3	63.7	70.0	65.4	72.6
N	918		856				856						
Chi-Square	11.71*		50.76**				44.05**						
df	1		3				6						

* Significant at the $p < .001$ level.

** Significant at the $p < .000$ level.

Role Limitations due to Physical Health and Income

The crosstabulation between RLPH and income was significant at the $p < .000$ level (refer to Table 2). The crosstabulation showed a strong linear relationship between RLPH and income. That is, as income increases so does the likelihood that an individual will experience less role limitations due to physical health. The greatest difference between contiguous categories occurs between those who have an annual household income of less than \$20,000 and those who have an annual household income of \$20,000 - \$39,999.

Role Limitations due to Physical Health and Socioeconomic Status

The crosstabulation between RLPH and SES was significant at the $p < .000$ level (refer to Table 2). The crosstabulation showed a more or less linear relationship between RLPH and SES. That is, as an individual's SES increases so does the likelihood that the individual will experience less role limitations due to physical health. The greatest difference between contiguous categories occurs between those who have low SES and those who have Upper-Low SES to Lower-Medium SES. Another large difference between contiguous categories occurs between those with Medium SES to Upper-Medium SES and those with Lower-high SES and higher.

Role Limitation due to Physical Health (RLPH)

Table 3: Crosstabulation Results for Role Limitation due to Physical Health and Independent Variables

	Education				Income (\$)				Socioeconomic Status						
	HS or Less	Degree n/c	Univ. Cert.	BA or higher	0-19,999	20,000-39,999	40,000-59,999	60,000 or higher	Low	Upper-Low	Lower-Medium	Medium	Upper-Medium	Lower-High	High
Max RLPH (%)	48.2	43.5	35.8	31.0	60.9	40.6	33.0	24.6	67.8	45.5	45.7	39.8	36.9	22.4	18.9
Min RLPH (%)	51.8	56.5	64.2	69.0	39.1	59.4	67.0	75.4	32.2	54.5	54.3	60.2	63.1	77.6	81.1
N	915				856				856						
Chi-Square	19.84**				63.95**				64.39**						
df	3				3				6						

** Significant at the p<.000 level.

Emotional Health and Education

The crosstabulation for education and emotional health was not significant. Therefore, education was removed from future analyses pertaining to emotional health.

Emotional Health and Income

The crosstabulation for income and emotional health was significant at the $p < .000$ level (refer to Table 3). The crosstabulation depicted a strong linear relationship between income and emotional health; as income increases so does the likelihood that an individual will experience good emotional health. The greatest difference between contiguous categories occurs between those with \$40,000 - \$59,999 annual household income and those with \$60,000 or more annual household income.

Emotional Health and Socioeconomic Status

The crosstabulation for emotional health and SES was significant at the $p < .000$ level (refer to Table 3). The crosstabulation depicted a more or less linear relationship for SES and emotional health; as SES increases so does the likelihood that an individual will have good emotional health. The greatest difference between contiguous categories occurs between those with Upper-Medium SES and those with Lower-High SES.

Emotional Health

Table 4: Crosstabulation Results for Emotional Health and Independent Variables

	Income (\$)				Socioeconomic Status						
	0-19,999	20,000-39,999	40,000-59,999	60,000 or higher	Low	Upper-Low	Lower-Medium	Medium	Upper-Medium	Lower-High	High
Poor EH (%)	60.7	52.1	46.1	33.9	54.4	57.1	55.0	52.0	44.6	31.8	35.8
Good EH (%)	39.3	47.9	53.9	66.1	45.6	42.9	45.0	48.0	55.4	68.2	64.2
N	855										
Chi-Square	32.92**										
df	3										
	27.19**										
	6										

**Significance at the p<.000 level.

Role Limitations due to Emotional Health (RLEH)

Table 5: Crosstabulation Results for Role Limitations due to Emotional Health and Independent Variables

	Income (\$)				Socioeconomic Status		
	0-19,999	20,000-39,999	40,000-59,999	60,000 or higher	Low	Medium	High
Max RLEH (%)	48.8	34.6	26.8	21.4	46.1	34.5	22.3
Min RLEH (%)	51.2	65.4	73.2	78.6	53.9	65.5	77.7
N	853				853		
Chi-Square	40.29**				18.00**		
df	3				3		

**Significance at the $p < .000$ level.

Role Limitations due to Emotional Health and Education

The crosstabulation for education and RLEH was not significant. Therefore, education was removed from future analyses with RLEH.

Role Limitations due to Emotional Health and Income

The crosstabulation for income and RLEH was significant at the $p < .000$ level (refer to Table 4). The crosstabulation depicted a linear relationship between RLEH and income. That is, as income increased so did the likelihood for the individual to experience less role limitations due to emotional health. The biggest difference between contiguous categories occurred between those who had less than \$20,000 annual household income and those who had \$20,000 - \$39,999 annual household income.

Role Limitations due to Emotional Health and SES

The crosstabulation for SES and RLEH was not significant. The crosstabulation was re-run with the following recoded three-category SES variable: (1) Low SES (Low SES) [10.6%]; (2) Medium SES (Upper-Low SES, Lower-Medium SES, Medium SES,

and Upper-Medium SES) [65.8%], and; (3) High SES (Lower-High SES and High SES) [23.6%], to determine if a three-category SES variable would have a stronger affect on RLEH than the original SES variable.

The crosstabulation for RLEH and the three-category SES was significant at the $p < .000$ level (refer to Table 4). The crosstabulation depicted a strong linear relationship between SES and RLEH; as SES increases so does the likelihood of the individual experiencing less role limitations due to emotional health. The three-category SES variable was used in the bivariate regression described in the following section.

General Perceived Health and Education

The crosstabulation for GPH and education was significant at the $p < .000$ level (refer to Table 5). The crosstabulation depicted a linear relationship between GPH and education; as education increases so does the likelihood that an individual experiences good GPH.

General Perceived Health and Income

The crosstabulation for GPH and income was significant at the $p < .000$ level (refer to Table 5). The crosstabulation depicted a linear relationship between GPH and income; as income increases so does the likelihood of an individual having good GPH. The greatest difference between contiguous categories occurs between those with less than \$20,000 annual household income and those with \$20,000 - \$39,999 annual household income.

General Perceived Health (GPH)

Table 6: Crosstabulation Results for General Perceived Health and Independent Variables

	Education				Income (\$)				Socioeconomic Status							
	HS or Less	Degree n/c	Univ. Cert.	BA or higher	0-19,999	20,000-39,999	40,000-59,999	60,000 or higher	Low	Upper-Low	Lower-Medium	Upper-Medium	Lower-High	High		
Poor GPH (%)	43.7	40.5	33.0	26.6	58.0	35.0	29.3	21.9	58.9	49.3	38.8	24.6	25.2	18.9		
Good GPH (%)	56.3	59.5	67.0	73.4	42.0	65.0	70.7	78.1	41.1	50.7	61.2	75.4	74.8	81.1		
N	916				856				856							
Chi-Square	19.93**				66.66**				55.89**							
df	3				3				6							

** Significant at the p<.000 level.

General Perceived Health and SES

The crosstabulation for GPH and SES was significant at the $p < .000$ level (refer to Table 5). The crosstabulation depicted a more or less linear relationship between SES and GPH; as SES increases so does the likelihood of the individual experiencing good GPH. The greatest difference between contiguous categories occurred between those who have Lower-Medium SES to Medium SES and those who have Upper-Medium SES to Lower-High SES. In addition, a great difference in contiguous categories occurred between those who have Upper-Low SES and those who have Lower-Medium SES to Medium SES.

Number of Chronic Conditions and Education

The crosstabulation for education and CC was not significant. Therefore, education was removed from further analyses pertaining to CC.

Number of Chronic Conditions and Income

The crosstabulation for CC and income was significant at the $p < .000$ level (refer to Table 6). The crosstabulation showed a linear relationship between CC and income. That is, as income increases so does the likelihood that an individual will have a small number of chronic conditions. The greatest difference between contiguous categories occurred between those who had \$20,000 - \$39,999 to \$40,000 - \$59,999 annual household income and those who had \$60,000 or higher annual household income. In addition, a great difference between contiguous categories occurred between those with less than \$20,000 annual household income and those with \$20,000 - \$39,999 to \$40,000 - \$59,999 annual household income.

Number of Chronic Conditions (CC)

Table 7: Crosstabulation Results for Chronic Conditions and Independent Variables

	Income (\$)					Socioeconomic Status					
	0-19,999	20,000-39,999	40,000-59,999	60,000 or higher	Low	Upper-Low	Lower-Medium	Medium	Upper-Medium	Lower-High	High
	Low CC (%)	49.5	60.3	60.7	75.0	48.4	53.0	57.4	62.6	67.7	66.4
High CC (%)	50.5	39.7	39.3	25.0	51.6	47.0	42.6	37.4	32.3	33.6	23.2
N	857										
Chi-Square	30.08**										
df	3										
	24.40**										
	6										

** Significant at the $p < .000$ level.

Number of Chronic Conditions and Socioeconomic Status

The crosstabulation for chronic conditions and SES was significant at the $p < .000$ level (refer to Table 6). The crosstabulation showed a more or less linear relationship between SES and CC. That is, as SES increases so does the likelihood that an individual will have a fewer number of CC. The greatest difference between contiguous categories occurred between those with Upper-Medium SES to Lower-High SES and those with High SES.

Results of Bivariate Regressions on Health and Independent Variables

To determine which IVs were to be used in subsequent analyses, bivariate regressions were run on all health variables with the IVs from the crosstabulations that were significant at the $p < .001$ level. The strength of the IV's on health variables were crudely classified into the following three categories: (1) weak correlate, IV explained less than 5% of the variance of health; (2) moderate correlate, IV explained 5% to 9.9% of the variance of health, and; (3) strong correlate, IV explained 10% or more of the variance of health.

Physical Functioning

Table 8: Bivariate Regression Results for Physical Functioning and IVs

IV	b	B	t	R ²	df	N
Education	5.76	.13	3.82**	.016	1 and 914	916
Income	6.42	.33	10.33**	.111	1 and 854	856
SES	3.34	.28	8.67**	.081	1 and 854	856

**Significant at the $p < .000$ level.

The bivariate regression between physical functioning and education was significant at the $p < .000$ level ($F=14.58$, $df=1$, $p < .000$) (refer to Table 7). Education explains 1.6% of the variation in physical functioning ($R^2=.016$). This model does not account for 98.4% of the variation in physical functioning. The Beta coefficient was .13

($p < .000$), which suggests that as education increases so does physical functioning.

Overall, education was significant but a weak correlate of physical functioning.

The bivariate regression between physical functioning and income was significant at the $p < .000$ level ($F=106.79$, $df=1$, $p < .000$) (refer to Table 7). Income explains 11.1% of the variation in physical functioning ($R^2=.111$). This model does not account for 88.9% of the variation in physical functioning. The Beta coefficient was .33 ($p < .000$), which suggests that as income increases so does physical functioning. Overall, income was significant and a strong correlate of physical functioning.

The bivariate regression between physical functioning and SES was significant at the $p < .000$ level ($F=75.15$, $df=1$, $p < .000$) (refer to Table 7). SES explains 8.1% of the variation in physical functioning ($R^2=.081$). This model does not account for 91.9% of the variation in physical functioning. The Beta coefficient was .28 ($p < .000$), which suggests that as SES increases so does physical functioning. Overall, SES was significant and a moderate correlate of physical functioning.

Role Limitations due to Physical Health (RLPH)

Table 9: Bivariate Regression Results for RLPH and IVs

IV	b	B	t	R ²	df	N
Education	4.79	.15	4.52**	.022	1 and 913	915
Income	10.04	.28	8.64**	.080	1 and 854	856
SES	5.82	.27	8.17**	.072	1 and 854	856

**Significant at the $p < .000$ level.

The bivariate regression between RLPH and education was significant at the $p < .000$ level ($F=20.46$, $df=1$, $p < .000$) (refer to Table 8). Education explains 2.2% of the variation in RLPH ($R^2=.022$). This model does not account for 97.8% of the variation in RLPH. The Beta coefficient was .15 ($p < .000$), which suggests that as education increases

so does the likelihood that an individual will experience less role limitations due to physical health. Overall, education was significant but a weak correlate of RLPH.

The bivariate regression between RLPH and income was significant at the $p < .000$ level ($F=74.65$, $df=1$, $p < .000$) (refer to Table 8). Income explains 8.0% of the variation in RLPH ($R^2=.080$). This model does not account for 92.0% of the variation in RLPH. The Beta coefficient was .28 ($p < .000$), which suggests that as income increases so does the likelihood that an individual will experience less role limitations due to physical health. Overall, income was significant and a moderate correlate of RLPH.

The bivariate regression between RLPH and SES was significant at the $p < .000$ level ($F=66.75$, $df=1$, $p < .000$) (refer to Table 8). SES explains 7.2% of the variation in RLPH ($R^2=.072$). This model does not account for 92.8% of the variation in RLPH. The Beta coefficient was .27 ($p < .000$), which suggests that as SES increases so does the likelihood that an individual will experience less role limitations due to physical health. Overall, SES was significant and a moderate correlate of RLPH.

Emotional Health

Table 10: Bivariate Regression Results for Emotional Health and IVs

IV	b	B	t	R ²	df	N
Income	-3.74	-.24	-7.27**	.058	1 and 853	855
SES	-1.81	-.19	-5.70**	.037	1 and 853	855

**Significant at the $p < .000$ level.

The bivariate regression between emotional health and income was significant at the $p < .000$ level ($F=52.81$, $df=1$, $p < .000$) (refer to Table 9). Income explains 5.8% of the variation in emotional health ($R^2=.058$). This model does not account for 94.2% of the variation in emotional health. The Beta coefficient was -.24 ($p < .000$), which suggests

that as income increases so does an individual's emotional health. Overall, income was significant and a moderate correlate of emotional health.

The bivariate regression between emotional health and SES was significant at the $p < .000$ level ($F=32.51$, $df=1$, $p < .000$) (refer to Table 9). SES explains 3.7% of the variation in emotional health ($R^2=.037$). This model does not account for 96.3% of the variation in emotional health. The Beta coefficient was $-.19$ ($p < .000$), which suggests that as SES increases so does the likelihood that an individual will experience good emotional wellbeing. Overall, SES was significant but a weak correlate of emotional health.

Role Limitations due to Emotional Health (RLEH)

Table 11: Bivariate Regression Results for RLEH and IVs

Independent Variable	b	B	t	R ²	df	N
Income	8.29	.26	7.81**	.067	1 and 854	856
SES	11.73	.19	5.51**	.033	1 and 854	856

**Significant at the $p < .000$ level.

The bivariate regression between RLEH and income was significant at the $p < .000$ level ($F=60.96$, $df=1$, $p < .000$) (refer to Table 10). Income explains 6.7% of the variation in RLEH ($R^2=.067$). This model does not account for 93.3% of the variation in RLEH. The Beta coefficient was $.26$ ($p < .000$), which suggests that as income increases so does the likelihood that an individual will experience less role limitations due to emotional health. Overall, income was significant and a moderate correlate of RLEH.

The bivariate regression between RLEH and SES was significant at the $p < .000$ level ($F=30.40$, $df=1$, $p < .000$) (refer to Table 10). SES explains 3.3% of the variation in RLEH ($R^2=.033$). This model does not account for 96.7% of the variation in RLEH. The Beta coefficient was $.19$ ($p < .000$), which suggests that as SES increases so does the

likelihood that an individual experiences less role limitations due to emotional health.

Overall, SES was significant but a weak correlate of RLEH.

General Perceived Health (GPH)

Table 12: Bivariate Regression Results for GPH and IVs

IV	b	B	t	R ²	df	N
Education	2.70	.15	4.69**	.023	1 and 914	916
Income	5.71	.30	9.11**	.089	1 and 854	856
SES	3.27	.28	8.48**	.078	1 and 854	856

**Significant at the $p < .000$ level.

The bivariate regression between GPH and education was significant at the $p < .000$ level ($F=21.98$, $df=1$, $p < .000$) (refer to Table 11). Education explains 2.3% of the variation in GPH ($R^2=.023$). This model does not account for 97.7% of the variation in GPH. The Beta coefficient was .15 ($p < .000$), which suggests that as education increases so does GPH. Overall, education was significant but a weak correlate of GPH.

The bivariate regression between GPH and income was significant at the $p < .000$ level ($F=83.07$, $df=1$, $p < .000$) (refer to Table 11). Income explains 8.9% of the variation in GPH ($R^2=.089$). This model does not account for 91.1% of the variation in GPH. The Beta coefficient was .30 ($p < .000$), which suggests that as income increases so does GPH. Overall, income was significant and a moderate correlate of GPH.

The bivariate regression between GPH and SES was significant at the $p < .000$ level ($F=71.95$, $df=1$, $p < .000$) (refer to Table 11). SES explains 7.8% of the variation in GPH ($R^2=.078$). This model does not account for 92.2% of the variation in GPH. The Beta coefficient was .28 ($p < .000$), which suggests that as SES increases so does GPH. Overall, SES was significant and a moderate correlate of GPH.

*Number of Chronic Conditions (CC)***Table 13: Bivariate Regression Results for CC and IVs**

IV	b	B	t	R ²	df	N
Income	-.30	-.24	-7.20**	.057	1 and 855	857
SES	-.17	-.22	-6.57**	.048	1 and 855	857

**Significant at the $p < .000$ level.

The bivariate regression between CC and income was significant at the $p < .000$ level ($F=51.82$, $df=1$, $p < .000$) (refer to Table 12). Income explains 5.7% of the variation in CC ($R^2=.057$). This model does not account for 94.3% of the variation in CC. The Beta coefficient was $-.24$ ($p < .000$), which suggests that as income increases so does the likelihood of an individual having a smaller number of chronic conditions. Overall, income was significant and a moderate correlate of CC.

The bivariate regression between CC and SES was significant at the $p < .000$ level ($F=43.10$, $df=1$, $p < .000$) (refer to Table 12). SES explains 4.8% of the variation in CC ($R^2=.048$). This model does not account for 95.2% of the variation in CC. The Beta coefficient was $-.22$ ($p < .000$), which suggests that as SES increases so does the likelihood of an individual having a smaller number of chronic conditions. Overall, SES was significant but a weak correlate of CC.

Conclusion

The following table summarizes the results of the bivariate regression analyses.

Table 14: Strength of Independent Variables on Dependent Health Variables

	WEAK CORRELATE	MODERATE CORRELATE	STRONG CORRELATE
PF	Education	SES	Income
RLPH	Education	Income SES	
EH	SES	Income	
RLEH	SES	Income	
GPH	Education	Income SES	
CC	SES	Income	

The table clearly shows how income, rather than SES and education, is a stronger correlate for all health outcomes. Therefore, income was used in subsequent analyses for this thesis.

Section 3.2 - What Types of Social Cohesion Play a Mediating Role in the Relationship between Income and Health?

Section 3.2 presents the results for social cohesion variables that had mediating effects on the income and health relationship. Subsection 3.2.a discusses any moderating effects on the income and health relationship.

Physical Functioning

When the various model 3s were run, testing for mediating effects, none of the social cohesion variables were significant. Thus, no mediating effects on the income and physical functioning relationship were revealed.

Role Limitations due to Physical Health (RLPH)

When the various model 3s were run, testing for mediating effects, none of the social cohesion variables were significant. Thus, no mediating effects on the income and RLPH relationship were revealed.

Emotional Health

When the various model 3s were run, testing for mediating effects, social capital, instrumental support, CBSC, and CPSC were not significant. Thus, no mediating effects on the income and emotional health relationship were revealed with the addition of these social cohesion variables. However, emotional support, when added to Model 3, was significant at the $p < .000$ level.

Emotional Support

Model 2 ($R^2_{adj} = 59.4\%$) explained 59.4% of the variance in emotional health.

Model 2 was significant ($F_{12, 820} = 102.43, p < .000$) at the $p < .000$ level.

Table 15: Regression Results for Emotional Support on Emotional Health

Independent Variable	Model 1 ($R^2_{adj} = .060^{**}$)		Model 2 ($R^2_{adj} = .594^{**}$)		Model 3 ($R^2_{adj} = .602^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	.25	7.35**	.08	3.22*	.06	2.39
Sex			.03	1.50	.01	.49
Age			.03	1.25	.03	1.42
Self-Efficacy			.07	2.79	.05	1.79
IHLC			.05	2.17	.05	2.20
Activity Level			-.01	-.22	-.01	-.45
Healthy Eating			.02	.97	.02	.91
Fruits/veggies			.01	.22	-.00	-.09
Fatty foods			-.03	-1.21	-.03	-1.13
Alcohol			.00	.11	.01	.56
Smoking			.01	.48	.01	.39
Stress			-.70	-27.30**	-.68	-26.35**
Emotional Support					.10	3.94**
Close Friends					.02	.98

* Significant at the $p < .001$ level.

** Significant at the $p < .000$ level.

[N = 833]

Income ($t_{820} = 3.22, p < .001$) was significant at the $p < .001$ level and explained 0.6% of the variance in emotional health. If an individual has a higher annual household income, s/he is more likely to have better emotional health. Perceived stress ($t_{820} = -27.30, p < .000$) was significant at the $p < .000$ level and explained 49.0% of the variance in

emotional health. That is, an individual who perceives her/his stress levels as high tends to experience worse emotional health. Demographic, psychological, and lifestyle variables were all not significant.

Model 3 added the emotional support variables. The regression ($R^2_{adj} = 60.2\%$) explained 60.2% of the variance in emotional health. Model 3 was significant ($F_{14, 818} = 91.03, p < .000$) at the $p < .000$ level. Income was no longer significant. The addition of emotional support variables weakened the income and emotional health relationship considerably. Perceived stress ($t_{818} = -26.35, p < .000$) was significant at the $p < .000$ level and explained 46.2% of the variance in emotional health. Perceived emotional support ($t_{818} = 3.94, p < .000$) was significant at the $p < .000$ level and explained 1.0% of the variance in emotional health. Number of close friends was not significant.

Since perceived stress had such a strong effect on the income and emotional health relationship, it was re-run without emotional support variables to determine if it had any mediating effects on the income and health relationship.

Perceived Stress

Model 1 (refer to Table 15) shows the bivariate regression of income on emotional health. Model 2 ($R^2_{adj} = 22.6\%$) explained 22.6% of the variance in emotional health. Model 2 was significant ($F_{11, 826} = 23.16, p < .000$) at the $p < .000$ level.

Income ($t_{826} = 4.64, p < .000$) was significant at the $p < .000$ level and explained 2.6% of the variance in emotional health in the expected direction. Age ($t_{826} = 4.50, p < .000$) was significant at the $p < .000$ level and explained 2.0% of the variance in emotional health. The older the individual the more likely s/he would experience better emotional health. Self-efficacy ($t_{826} = 10.73, p < .000$) was significant at the $p < .000$ level

and explained 12.3% of the variance in emotional health. Individuals with higher rates of self-efficacy were more likely to experience better emotional health. Sex, IHLC, and lifestyle variables were all not significant.

Table 16: Mediating Effects of Perceived Stress on Emotional Health

Independent Variable	Model 1 ($R^2_{adj} = .060^{**}$)		Model 2 ($R^2_{adj} = .226^{**}$)		Model 3 ($R^2_{adj} = .594^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	.25	7.37**	0.16	4.64**	0.08	3.25*
Sex			-0.03	-1.08	0.04	1.53
Age			0.14	4.50**	0.03	1.27
Self-efficacy			0.35	10.73**	0.07	2.82
IHLC			0.08	2.60	0.05	2.23
Activity Level			0.01	0.42	-0.01	-0.28
Healthy Eating			0.07	2.00	0.03	0.99
Fruit/veggie			0.06	1.68	0.01	0.30
Fatty food			-0.03	-0.96	-0.03	-1.22
Alcohol			0.00	0.13	0.00	0.19
Smoking			0.01	0.41	0.01	0.48
Stress					-0.70	-27.40**

* Significant at the $p < .001$ level.

** Significant at the $p < .000$ level.

[N=838]

Model 3 added perceived stress. The regression ($R^2_{adj} = 59.4\%$) explained 59.4% of the variance in emotional health and was significant ($F_{12, 825} = 103.08, p < .000$) at the $p < .000$ level. Income ($t_{825} = 3.25, p < .001$) was now only significant at the $p < .001$ level and explained 0.6% of the variance in emotional health. Perceived stress ($t_{825} = -27.40, p < .000$) was significant at the $p < .000$ level and explained 49.0% of the variance in emotional health in the expected direction. Age and self-efficacy were no longer significant. The addition of perceived stress removed any effects that age and self-efficacy had on the emotional health relationship.

Overall, emotional support contributed a mediating effect to the income and emotional health relationship, albeit a smaller one than perceived stress. Emotional support reduced the negative effect of income on emotional health by 0.2%, whereas,

perceived stress reduced the negative effect of income on emotional health by 2.0%. However, emotional support did reduce income to insignificance when added to the model, whereas, perceived stress did not have this effect on income.

Role Limitations due to Emotional Health (RLEH)

When the various model 3s were run, testing for mediating effects, none of the social cohesion variables were significant. Thus, no mediating effects on the income and RLEH relationship were revealed.

General Perceived Health (GPH)

When the various model 3s were run, testing for mediating effects, social capital, emotional support, instrumental support, and CBSC were not significant. Thus, no mediating effects on the income and GPH relationship were revealed when these social cohesion variables were added. However, when fear of crime was added to Model 3 it was significant at the $p < .000$ level.

Fear of Crime

Model 1 (refer to Table 16) shows the bivariate regression of income on GPH. Model 2 ($R^2_{adj} = 35.2\%$) explained 35.2% of the variance in GPH and was significant ($F_{12, 701} = 33.27, p < .000$) at the $p < .000$ level.

Income ($t_{701} = 4.39, p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in GPH in the expected direction. Self-efficacy ($t_{701} = 5.90, p < .000$) was significant at the $p < .000$ level and explained 4.4% of the variance in GPH in the expected direction. Internal Health Locus of Control (IHLC) ($t_{701} = 8.42, p < .000$) was significant at the $p < .000$ level and explained 6.8% of the variance in GPH. If an individual had higher IHLC, s/he was more likely to have better GPH. Activity level (t_{701}

= 3.42, $p < .001$) was significant at the $p < .001$ level and explained 1.2% of the variance in GPH. If an individual was highly active, s/he was more likely to have better GPH. Perceived stress ($t_{701} = -5.36$, $p < .000$) was significant at the $p < .000$ level and explained 3.6% of the variance in GPH in the expected direction. Demographic and remaining lifestyle variables were all not significant.

Table 17: Regression Results for CPSC on GPH

Independent Variable	Model 1 ($R^2_{adj} = .088^{**}$)		Model 2 ($R^2_{adj} = .352^{**}$)		Model 3 ($R^2_{adj} = .368^*$)	
	Beta	t	Beta	t	Beta	t
Income	0.30	8.35**	0.15	4.39**	0.15	4.29**
sex			0.06	2.06	0.07	2.33
Age			-0.01	-0.21	-0.02	-0.69
Self-Efficacy			0.21	5.90**	0.21	5.84**
IHLC			0.26	8.42**	0.25	8.04**
Activity Level			0.11	3.42*	0.10	3.25*
Healthy Eating			0.09	2.57	0.10	2.80
Fruits/veggies			-0.07	-2.00	-0.07	-2.05
Fatty foods			-0.01	-0.18	0.01	0.19
Alcohol			-0.07	-2.02	-0.07	-2.08
Smoking			0.08	2.45	0.08	2.39
Stress			-0.19	-5.36**	-0.15	-4.03**
Sense of Belonging					0.01	0.26
Trust Neighbours					0.05	1.52
Desire to be Involved					-0.02	-0.62
Fear of Crime					0.13	3.63**
Healthy Neighbourhood					0.00	0.02
Neighbouring					-0.03	-0.88

* Significant at the $p < .001$ level.

** Significant at the $p < .000$ level.

[N = 714]

Model 3 ($R^2_{adj} = 36.8\%$) explained 36.8% of the variance in GPH and was significant ($F_{18, 695} = 24.02$, $p < .000$) at the $p < .000$ level.

Income ($t_{695} = 4.29$, $p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in GPH. The addition of CPSC variables did not change the variance explained by income on GPH. Self-efficacy ($t_{695} = 5.84$, $p < .000$) was significant at the $p < .000$ level and explained 4.4% of the variance in GPH. IHLC ($t_{695} = 8.04$,

$p < .000$) was significant at the $p < .000$ level and explained 6.3% of the variance explained in GPH. Activity level ($t_{695} = 3.25$, $p < .001$) was significant at the $p < .001$ level and explained 1.0% of the variance in GPH. Perceived stress ($t_{695} = -4.03$, $p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in GPH. Fear of crime ($t_{695} = 3.63$, $p < .000$) was significant at the $p < .000$ level and explained 1.7% of the variance in GPH. That is, an individual who felt safer in her/his neighbourhood was more likely to experience better GPH. All remaining CPSC variables were not significant.

Overall fear of crime was the only CPSC variable to have a significant main effect on GPH. However, fear of crime did not contribute a mediating effect to the income and GPH relationship, as the variance explained by income did not change from Model 2 to Model 3. Due to the large difference in the Beta value of income between Model 1 and Model 2, another regression was run to see if IHLC contributed a mediating effect on the income and GPH relationship. IHLC was chosen as a potential mediator because it was the independent variable in Model 2 that had the largest direct effect on GPH.

Internal Health Locus of Control (IHLC)

Model 2 (refer to Table 17) ($R^2_{adj} = 27.9\%$) explained 27.9% of the variance in GPH and was significant ($F_{11, 826} = 30.49$, $p < .000$) at the $p < .000$ level.

Income ($t_{826} = 3.85$, $p < .000$) was significant at the $p < .000$ level and explained 1.7% of the variance in GPH in the expected direction. Self-efficacy ($t_{826} = 6.10$, $p < .000$) was significant at the $p < .000$ level and explained 4.4% of the variance in GPH in the expected direction. Activity level ($t_{826} = 4.73$, $p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in GPH in the expected direction. Smoking ($t_{826} =$

3.26, $p < .001$) was significant at the $p < .001$ level and explained 1.0% of the variance in GPH. Smoking was a dichotomous variable, where smokers were the reference category; therefore, individuals who did not smoke had higher levels of GPH than individuals who did smoke. Perceived stress ($t_{826} = -6.74$, $p < .000$) was significant at the $p < .000$ level and explained 5.3% of the variance in GPH in the expected direction. Demographic and remaining lifestyle variables were all not significant.

Table 18: Regression Results for IHLC on GPH

Independent Variable	Model 1 ($R^2_{adj} = .081^{**}$)		Model 2 ($R^2_{adj} = .248^{**}$)		Model 3 ($R^2_{adj} = .355^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	.29	8.65**	.13	3.85**	.14	4.33**
Sex			.05	1.66	.05	1.81
Age			-.03	-1.02	-.01	-.17
Self-Efficacy			.21	6.10**	.17	5.17**
Activity Level			.15	4.73**	.13	4.48**
Healthy Eating			.08	2.49	.08	2.66
Fruits/veggies			-.05	-1.47	-.06	-1.97
Fatty foods			.00	.02	.00	.01
Alcohol			-.07	-2.11	-.06	-2.02
Smoking			.10	3.26*	.09	3.20*
Stress			-.23	-6.74**	-.21	-6.63**
IHLC					.28	9.90**

* Significant at the $p < .001$ level.

** Significant at the $p < .000$ level.

[N=838]

Model 3 ($R^2_{adj} = 35.5\%$) explained 35.5% of the variance in GPH and was significant ($F_{12, 825} = 39.35$, $p < .000$) at the $p < .000$ level. Income ($t_{825} = 4.33$, $p < .000$) was significant at the $p < .000$ level and explained 2.0% of the variance in GPH. Income explained more variance in GPH when IHLC was added to the model than when the variable was excluded, thus, removing the possibility of IHLC acting as a mediator on the income and health relationship. Self-efficacy ($t_{825} = 5.17$, $p < .000$) was significant at the $p < .000$ level and explained 2.9% of the variance in GPH. Self-efficacy explained less

variance in GPH when IHLC was added to the model. Activity level ($t_{825} = 4.48, p < .000$) was significant at the $p < .000$ level and explained 1.7% of the variance in GPH. Smoking ($t_{825} = 3.20, p < .001$) was significant at the $p < .001$ level and explained 0.8% of the variance in GPH. Smoking explained less variance in GPH when IHLC was added to the model. Perceived stress ($t_{825} = -6.63, p < .000$) was significant at the $p < .000$ level and explained 4.4% of the variance in GPH. Perceived stress explained less variance in GPH when IHLC was added to the model. IHLC ($t_{825} = 9.90, p < .000$) was significant at the $p < .000$ level and explained 7.8% of the variance explained in GPH in the expected direction.

Despite the IHLC variables' significant contribution to the variance explained in GPH, it did not reveal a mediating effect on the income and GPH relationship. In fact, IHLC increased the negative effect of income on health. The failure of IHLC to produce a mediating effect could be due to the small percent of variance explained by IHLC (6.8%) in the original model that included CPSC variables.

Chronic Conditions (CC)

When the various model 3s were run, testing for mediating effects, none of the social cohesion variables were significant. Thus, no mediating effects on the income and RLEH relationship were revealed.

Section 3.2.a. – Moderating Effects on Income and Health

Interactions were created for each social cohesion variable on income to determine if there was a moderating effect on income and health. Social cohesion and income interactions were run on each of the six health variables. None of these interactions were significant when run in the income and health models when control

variables were added. Therefore, there were no moderating effects for any of the income and health relationships.

Conclusion

Emotional support and fear of crime were significant when explaining the variance in emotional health and GPH respectively. No other social cohesion variables were significantly associated with health. Emotional support was the only variable to produce a mediating effect on the income and emotional health relationship, whereas fear of crime did not produce a mediating effect on the relationship between income and GPH. None of the other social cohesion variables produced a mediating effect on income and health. Interestingly, perceived stress seemed to have a much stronger relationship with emotional health and produced a more significant mediating effect on the income and emotional health relationship than emotional support. Regardless of the strength of perceived stress, emotional support weakened the effect of income on emotional health by making income no longer significant. In addition, no moderating effects were found on the income and health relationship when control variables were added.

In the next section, social cohesion variables that were significant correlates of health and had a mediating effect on income and health, were run in an analysis as dependent variables. Considering the outcomes for research question 2, emotional support and fear of crime will be the only social cohesion variables to be tested. As well, considering the mediating effects that perceived stress had on income and emotional health, it too will be included in research question 3.

Section 3.3a – Are Community Psychosocial Social Cohesion Indicators and Length of Residency more Highly Correlated with Social Capital and Community Behavioural Social Cohesion Levels than Social Inequality Indicators?

Emotional Support

Model 1 (refer to Table 18) ran the social inequality factors (e.g., income, sex, and age) on emotional support. This regression ($R^2_{adj} = 12.2\%$) explained 12.2% of the variance in emotional support, although it was significant ($F_{3, 722} = 34.53, p < .000$) at the $p < .000$ level.

Table 19: Social Inequality Factors, CPSC & Length of Residency on Emotional Support

Independent Variable	Model 1 ($R^2_{adj} = .122^{**}$)		Model 2 ($R^2_{adj} = .186^{**}$)		Model 3 ($R^2_{adj} = .185^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	0.32	9.09**	0.27	7.54**	0.27	7.55**
Sex	0.21	5.87**	0.20	5.84**	0.20	5.85**
Age	0.01	0.38	-0.03	-0.74	-0.02	-0.63
Sense of Belonging			0.08	1.97	0.08	2.02
Trust Neighbours			0.15	4.06**	0.15	4.08**
Desire to be Involved			0.03	0.83	0.03	0.76
Fear of Crime			0.09	2.34	0.09	2.26
Healthy Neighbourhood			0.00	0.04	0.01	0.11
Neighbouring			0.06	1.67	0.07	1.73
Length of Residency					-0.02	-0.59

** Significant at the $p < .000$ level.

[N=726]

Income ($t_{722} = 9.09, p < .000$) was significant at the $p < .000$ level and explained 10.2% of the variance in emotional support. If an individual has a higher annual household income, s/he is more likely to have a greater amount of emotional support. Sex ($t_{722} = 5.87, p < .000$) was significant at the $p < .000$ level and explained 4.4% of the variance in emotional support. Sex is a dichotomous variable, where men are the reference category, thus women are more likely to have a higher amount of emotional support than men are. Age was not significant.

Model 2 added the CPSC variables. The regression ($R^2_{adj} = 18.6\%$) explained 18.6% of the variance in emotional support, although it was significant ($F_{9, 716} = 19.39$, $p < .000$) at the $p < .000$ level. Income ($t_{716} = 7.54$, $p < .000$) was significant at the $p < .000$ level and explained 7.3% of the variance in emotional support. Income explained less when CPSC variables were added to the model. Sex ($t_{716} = 5.84$, $p < .000$) was significant at the $p < .000$ level and explained 4.0% of the variance in emotional support. Sex explained less when CPSC variables were added to the model. Trust neighbours ($t_{716} = 4.06$, $p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in emotional support. That is, the more likely an individual was to trust her/his neighbours the higher her/his emotional support was. The remaining CPSC variables were not significant.

Model 3 added the length of residency variable. The regression ($R^2_{adj} = 18.5\%$) explained 18.5% of the variance in emotional support, and was significant ($F_{10, 715} = 17.47$, $p < .000$) at the $p < .000$ level. Income ($t_{715} = 7.55$, $p < .000$) was significant at the $p < .000$ level and explained 7.3% of the variance in emotional support. Income explained the same amount when length of residency was added to the model. Sex ($t_{715} = 5.85$, $p < .000$) was significant at the $p < .000$ level and explained 4.0% of the variance in emotional support. Sex explained the same amount when length of residency was added to the model. Trust neighbours ($t_{715} = 4.08$, $p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in emotional support. Trust neighbours explained the same amount when length of residency was added to the model. Length of residency was not significant. Overall, income was the greatest correlate of emotional support. Of the significant variables, income had a greater Beta value than sex or trust neighbours.

Fear of Crime

Model 1 (refer to Table 19) ($R^2_{adj} = 3.2\%$) explained 3.2% of the variance in fear of crime, and was significant ($F_{3, 722} = 8.98, p < .000$) at the $p < .000$ level. Age ($t_{722} = 4.22, p < .000$) was significant at the $p < .000$ level and explained 2.6% of the variance in fear of crime. Unexpectedly, if an individual was older s/he was less likely to fear crime. Income and sex were not significant.

Table 20: Social Inequality, CPSC, and Length of Residency Indicators on Fear of Crime

Independent Variable	Model 1 ($R^2_{adj} = .032^{**}$)		Model 2 ($R^2_{adj} = .292^{**}$)		Model 3 ($R^2_{adj} = .300^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	.06	1.73	-.04	-1.12	-.03	-0.77
Sex	-.09	-2.41	-.05	-1.45	-.05	-1.40
Age	.16	4.22**	.06	1.99	.08	2.44
Sense of Belonging			.10	2.72	.11	3.02
Trust Neighbours			.09	2.64	.09	2.74
Desire to be Involved			.01	0.33	.00	-0.04
Healthy Neighbourhood			.46	13.01**	.46	13.30**
Neighbouring			.02	.42	.03	0.75
Length of Residency					-.10	-3.02

**Significant at the $p < .000$ level.

[N=726]

Model 2 added the CPSC variables. The regression ($R^2_{adj} = 29.2\%$) explained 29.2% of the variance in fear of crime and was significant ($F_{8, 717} = 38.39, p < .000$) at the $p < .000$ level. Age became no longer significant with the addition of CPSC variables. Healthy neighbourhood ($t_{717} = 13.01, p < .000$) was significant at the $p < .000$ level and explained 21.2% of the variance in fear of crime. That is, an individual who considers her/his neighbourhood healthy tends to feel safer from crime in her/his neighbourhood. All remaining CPSC variables were not significant.

Model 3 added the length of residency variable. The regression ($R^2_{adj} = 30.0\%$) explained 30.0% of the variance in fear of crime and was significant ($F_{9, 716} = 35.52,$

$p < .000$) at the $p < .000$ level. Healthy neighbourhood ($t_{716} = 13.30$, $p < .000$) was still significant at the $p < .000$ level and explained 21.2% of the variance in fear of crime. Healthy neighbourhood explained the same amount when length of residency was added to the model. Length of residency was not significant.

Overall, healthy neighbourhood was the greatest correlate of fear of crime. Social inequality indicators explained little to no variance of fear of crime. As well, length of residency contributed little to the overall variance of fear of crime, as it was not significant and Model 3 had an F-value that was lower than Model 2. Model 2 had the best fit for the overall explained variance in fear of crime, which was exemplified by its higher F-value due to the significant contribution of health neighbourhood and its large explanation of variance in fear of crime (21.2%).

Perceived Stress

Model 1 (refer to Table 20) ($R^2_{adj} = 7.6\%$) explained 7.62% of the variance in perceived stress and was significant ($F_{3, 722} = 20.96$, $p < .000$) at the $p < .000$ level. Income ($t_{722} = -6.49$, $p < .000$) was significant at the $p < .000$ level and explained 5.8% of the variance in perceived stress in the expected direction. Age ($t_{722} = -4.59$, $p < .000$) was significant at the $p < .000$ level and explained 2.9% of the variance in perceived stress. That is, the older an individual, the more likely s/he will experience lower levels of perceived stress. Sex was not significant.

Model 2 ($R^2_{adj} = 15.0\%$) explained 15.0% of the variance in perceived stress, although it was significant ($F_{9, 716} = 15.27$, $p < .000$) at the $p < .000$ level. Income ($t_{716} = -6.26$, $p < .000$) was significant at the $p < .000$ level and explained 5.3% of the variance in perceived stress. Income explained slightly less when CPSC variables were added to the

model. Age ($t_{716} = -3.72$, $p < .000$) was significant at the $p < .000$ level and explained 1.7% of the variance in perceived stress. Age explained marginally less when CPSC variables were added to the model. Fear of crime ($t_{716} = -6.32$, $p < .000$) was significant at the $p < .000$ level and explained 6.8% of the variance in perceived stress. That is, individuals who experienced less fear of crime in their neighbourhoods, tended to have lower levels of perceived stress. All remaining CPSC variables were not significant.

Table 21: Social Inequality, CPSC, and Length of Residency Indicators on Perceived Stress

Independent Variable	Model 1 ($R^2_{adj} = .076^{**}$)		Model 2 ($R^2_{adj} = .150^{**}$)		Model 3 ($R^2_{adj} = .156^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	-.24	-6.49**	-.23	-6.26**	-.24	-6.49**
Sex	.05	1.37	.03	0.76	.03	.74
Age	-.17	-4.59**	-.13	-3.72**	-.15	-4.06**
Sense of Belonging			-.09	-2.19	-.10	-2.44
Trust Neighbours			-.06	-1.67	-.07	-1.77
Desire to be Involved			.09	2.37	.10	2.64
Fear of Crime			-.26	-6.32**	-.25	-6.04**
Healthy Neighbourhood			.04	0.99	.03	0.69
Neighbouring			.08	1.93	.07	1.67
Length of Residency					.08	2.30

** Significant at the $p < .000$ level.

[N=726]

Model 3 ($R^2_{adj} = 15.6\%$) explained 15.6% of the variance in perceived stress and was significant ($F_{10, 715} = 14.35$, $p < .000$) at the $p < .000$ level. Income ($t_{715} = -6.49$, $p < .000$) was significant at the $p < .000$ level and explained 5.8% of the variance in perceived stress. Income explained more when length of residency was added to the model. Age ($t_{715} = -4.06$, $p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in perceived stress. Age explained more when length of residency was added to the model. Fear of crime ($t_{715} = -6.04$, $p < .000$) was significant at the $p < .000$ level and explained 6.3% of the variance in perceived stress. Fear of crime explained less

when length of residency was added to the model. Length of residency was not significant. Overall, income, age, and fear of crime were significant correlates of perceived stress.

Section 3.3.b – Are social inequality factors better correlates of social capital and CBSC than CPSC and length of residency variables?

Interpersonal Trust

Model 1 (refer to Table 21) ($R^2_{adj} = 9.4\%$) explained 9.4% of the variance in interpersonal trust and was significant ($F_{3, 719} = 25.96, p < .000$) at the $p < .000$ level. Income ($t_{719} = 8.71, p < .000$) was significant at the $p < .000$ level and explained 10.2% of the variance in interpersonal trust. If an individual has a higher annual household income, s/he was more likely to have a greater amount of interpersonal trust. The remaining social inequality variables were not significant.

Table 22: Social Inequality Factors, CPSC & Length of Residency on Interpersonal Trust

Independent Variable	Model 1 ($R^2_{adj} = .094^{**}$)		Model 2 ($R^2_{adj} = .205^{**}$)		Model 3 ($R^2_{adj} = .204^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	0.32	8.71**	0.25	7.04**	0.25	6.90**
Sex	0.10	2.65	0.08	2.26	0.08	2.25
Age	0.06	1.64	0.02	0.62	0.02	0.48
Sense of Belonging			0.11	2.82	0.11	2.71
Trust Neighbours			0.24	6.51**	0.24	6.50**
Desire to be Involved			0.03	0.69	0.03	0.79
Fear of Crime			0.08	1.99	0.08	2.07
Healthy Neighbourhood			-0.06	-1.38	-0.06	-1.47
Neighbouring			0.08	2.21	0.08	2.10
Length of Residency					0.03	0.86

** Significant at the $p < .000$ level.

[N=723]

Model 2 ($R^2_{adj} = 20.5\%$) explained 20.5% of the variance in interpersonal trust and was significant ($F_{9, 713} = 21.63, p < .000$) at the $p < .000$ level. Income ($t_{713} = 7.04,$

$p < .000$) was significant at the $p < .000$ level and explained 6.3% of the variance in interpersonal trust. Income explained less when CPSC variables were added to the model. Trust neighbours ($t_{713} = 6.51, p < .000$) was significant at the $p < .000$ level and explained 5.8% of the variance in interpersonal trust. That is, the more likely an individual was to trust her/his neighbours, the more likely that s/he had higher interpersonal trust levels. All remaining CPSC variables were not significant.

Model 3 ($R^2_{adj} = 20.4\%$) explained 20.4% of the variance in interpersonal trust and was significant ($F_{10, 712} = 19.53, p < .000$) at the $p < .000$ level. Income ($t_{712} = 6.90, p < .000$) was significant at the $p < .000$ level and explained 6.3% of the variance in interpersonal trust. Income remained unchanged from Model 2. Trust neighbours ($t_{712} = 6.50, p < .000$) was significant at the $p < .000$ level and explained 5.8% of the variance in interpersonal trust. Trust neighbours remained unchanged from Model 2. Length of residency was not significant.

Overall, income and trust neighbours were the only significant correlates of interpersonal trust. Income, rather than trust neighbours, explained the most variance in interpersonal trust; thus, making a social inequality indicator, rather than CPSC or length of residency indicators, a better correlate of interpersonal trust.

Formal Group Membership

To determine if social inequality factors, CPSC variables, or the length of residency variable were significant correlates of formal group membership, a binary logistic regression was run because formal group membership was a dichotomous variable (yes/no). None of the social inequality variables, CPSC variables, or the length of residency variable were significantly associated with formal group membership.

Informal Group Membership

To determine if social inequality factors, CPSC variables, or the length of residency variable were significant correlates of informal group membership, a binary logistic regression was run because informal group membership was a dichotomous variable (yes/no). None of the social inequality variables, CPSC variables, or the length of residency variable were significantly associated with informal group membership.

Community Activities

Model 1 (refer to Table 22) ($R^2_{adj} = 2.3\%$) explained 2.3% of the variance in community activities and was significant ($F_{3, 721} = 6.66, p < .000$) at the $p < .000$ level. Income ($t_{721} = 3.72, p < .000$) was significant at the $p < .000$ level and explained 2.0% of the variance in community activities. If an individual has a higher annual household income, s/he was more likely to have attended more community activities. All remaining social inequality indicators were not significant.

Table 23: Social Inequality Factors, CPSC & Length of Residency on Community Activities

Independent Variable	Model 1 ($R^2_{adj} = .023^{**}$)		Model 2 ($R^2_{adj} = .148^{**}$)		Model 3 ($R^2_{adj} = .150^{**}$)	
	Beta	t	Beta	t	Beta	t
Income	0.14	3.72**	0.10	2.59	0.09	2.41
Sex	0.08	2.10	0.04	1.16	0.04	1.14
Age	-0.06	-1.48	-0.08	-2.33	-0.09	-2.55
Sense of Belonging			0.09	2.13	0.08	1.95
Trust Neighbours			0.05	1.25	0.05	1.19
Desire to be Involved			0.24	6.58**	0.25	6.72**
Fear of Crime			-0.03	-0.78	-0.03	-0.61
Healthy Neighbourhood			-0.02	-0.34	-0.02	-0.53
Neighbouring			0.15	3.86**	0.14	3.67**
Length of Residency					0.06	1.51

**Significant at the $p < .000$ level.

[N=725]

Model 2 ($R^2_{adj} = 14.8\%$) explained 14.8% of the variance in community activities and was significant ($F_{9, 715} = 14.99, p < .000$) at the $p < .000$ level. Income became not significant when CPSC variables were added to the model. Desire to be involved ($t_{715} = 6.58, p < .000$) was significant at the $p < .000$ level and explained 5.8% of the variance in community activities. That is, an individual who had a greater desire to be involved in the community was more likely to attend a greater number of community activities. Neighbouring ($t_{715} = 3.86, p < .000$) was significant at the $p < .000$ level and explained 2.3% of the variance in community activities. That is, an individual who knew more of her/his neighbours was more likely to attend a greater number of community activities. All remaining CPSC variables were not significant.

Model 3 ($R^2_{adj} = 15.0\%$) explained 15.0% of the variance in community activities and was significant ($F_{10, 714} = 13.74, p < .000$) at the $p < .000$ level. Desire to be involved ($t_{714} = 6.72, p < .000$) was significant at the $p < .000$ level and explained 6.3% of the variance in community activities. Desire to be involved explained more variance when length of residency was added to the model. Neighbouring ($t_{714} = 3.67, p < .000$) was significant at the $p < .000$ level and explained 2.0% of the variance in community activities. Neighbouring explained less variance when length of residency was added to the model. Length of residency was not significant.

Overall, desire to be involved and neighbouring were the only significant correlates of community activities. Income was significant in Model 1; however, when the CPSC variables were added it lost its significance. Since social inequality variables and the length of residency variable failed to be significant correlates of community

activities, CPSC variables can be understood to be the best correlates of community activities.

Conclusion

Chapter three presented the results to the three research questions posed in this thesis. Overall, income was shown to be the most significant correlate for all six health variables. In terms of mediating effects of social cohesion on income and health, emotional support was the only significant mediator found, and only for emotional health. For social capital and CBSC variables, income was a correlate for interpersonal trust only and CPSC variables were correlates of community activities. The following chapter will discuss these results in more detail and address their relevance for the social capital-health literature.

Section 4.0 – Introduction to Discussion of Results Chapter

This chapter discusses the results of the analyses of the three research questions posed in this thesis. Each section elaborates on the expectations and findings of the analyses of the research question, as well as any implications for the social capital-health literature.

Section 4.1 – Discussion of the Results for the First Research Question: Does Income, Education, or SES have a Greater Direct Effect on Health Outcomes?

As discussed earlier, Wilkinson's work (1996) is aggregated at the country level and thus, chooses the GINI index as a measure for income inequality and a country's average GDP to measure absolute income (the problems with relying on such broad measures to determine individual differences are discussed extensively in section 1.5 of this thesis). This thesis examined data at the individual level; thus, the analyses used SES to measure income inequality and annual household income to measure absolute income (the problems associated with using SES as an indicator for income inequality and annual household income as an indicator of absolute income are discussed in section 1.8a). The thesis hypothesized that absolute income would be a better correlate of health status than income inequality because status tends to measure everyone along the same social hierarchy, ignoring the complexity of individuals and reducing them to a homogeneous entity. Income is believed to be more crucial to determining one's health outcome as it facilitates other factors that lead to poor health outcomes. Examples include: availability of the necessities required for healthy living (e.g., food, shelter, and clothing), and lifestyle factors (e.g., poorer people tend to smoke more, drink more, exercise less, and eat worse than their higher income counterparts). This thesis contends that even rich

developed countries have poor people who cannot afford the basic necessities for sustainable living.

When income, education, and SES were run against the six health variables (i.e., physical functioning, role limitations due to physical health [RLPH], emotional health, role limitations due to emotional health [RLEH], general perceived health [GPH], and chronic conditions), income explained the most variance in health for all health variables. Income was either a strong correlate, as in the case for physical functioning, or a moderate correlate, as it was for the remaining five health variables. SES was either a moderate correlate, as in the case for physical functioning, RLPH, and GPH, or a weak correlate, as it was for the remaining three health variables. Education was a weak correlate of physical functioning, RLPH, and GPH, and failed to be a correlate for the remaining three health variables. This provides evidence for the case that absolute income explains more of the variance in health than income inequality. Results preclude the importance of relative status over income when determining health outcomes for the individual.

Wilkinson (1996) argues that differences in health outcomes are present at all points along the income continuum. His argument is rooted in the outcomes of the UK's Whitehall study (Wilkinson, 1996). The Whitehall study researched health outcomes at higher echelons of the income strata and found that individuals located right below individuals who were in the highest income brackets were at a greater disadvantage in terms of good health outcomes when compared to their higher income earning counterparts (Marmot et al., 1984; Marmot et al., 1987). Research question 1 examined this argument using crosstabulations for income and health.

The results of the crosstabulations for income and health tended to demonstrate that individuals with lower levels of annual household income had worse health than those with higher income levels in a linear relationship. Differences in health outcomes were smaller when comparisons were made between contiguous categories higher up the income continuum. This was illustrated by the crosstabulation for income and physical functioning; the greatest difference in health status was between contiguous categories for individuals who had less than \$20,000 annual household income and individuals who had \$20,000 to \$39,000 annual household income. As well, the same trend occurred when crosstabulations were run for income and RLPH, RLEH, and GPH. That is, the greatest differences in health outcomes occurred between contiguous categories for individuals who were located in the lowest income level (e.g., less than \$20,000) compared to individuals who had an annual household income level of \$20,000 to \$39,000. This provides evidence that income differences and their adverse effects on health are much more pronounced at the bottom of the income continuum. This finding also illustrates that absolute income is a better indicator of health differences than income inequality in the cases of physical functioning, RLPH, RLEH, and GPH; as the worst health was concentrated to individuals with low levels of annual household income.

However, the crosstabulation results for emotional health and chronic conditions did produce differences in health outcomes across the income continuum. Both emotional health and chronic conditions produced significant health differences higher on the income continuum. For example, for emotional health the greatest health difference between contiguous categories was between individuals located in the \$40,000 - \$59,999 range and individuals located in the \$60,000 or higher range. Similarly, for chronic

conditions the greatest health difference between contiguous categories was between individuals who had an annual household income of \$20,000-\$39,999 to \$40,000 - \$59,999 and individuals who had an annual household income of \$60,000 or higher. However, for chronic conditions another great health difference between contiguous categories was between individuals who had an annual household income of less than \$20,000 and individuals who had annual household income in the \$20,000-\$39,999 to \$40,000-\$59,999 range.

Overall, income was the greatest correlate of health over education and SES, which serves as evidence that absolute income is more significant in determining health outcomes than income inequality. However, the thesis acknowledges that SES and annual household income are not the ideal measures for income inequality and absolute income; as SES assumes all individuals measure their status along the same social hierarchy, and income does not capture wealth. In addition, relative to other variables run in subsequent analyses, such as perceived stress (to be discussed in greater detail in following sections), income was not the greatest correlate of health. Nevertheless, the results of research question 1 formed the basis for the remaining analyses. Of the social inequality variables proposed as stressors in the stress process model (discussed in section 1.8.a), the results from research question 1 indicate that income is the most suitable variable to conceptualize as a stressor. Thus, the mediating effects of social support were tested on the income and health relationship.

Section 4.2 – Discussion of the Results for the Second Research Question: What Types of Social Cohesion Play a Mediating Role in the Relationship between Income and Health?

The second research question determined if Wilkinson's social capital variables were greater mediators on income and health than other social cohesion variables. According to Wilkinson (1996; 1999; 2002), individuals can alleviate psychosocial stresses, such as depression, anxiety, and lack of control, through acquiring social capital resources, which in turn produces favourable health outcomes; thus, suggesting that social capital produces a mediating effect on the income and health relationship. The thesis hypothesized that social capital variables would have less of a mediating effect on income and health when compared to the other forms of social cohesion, such as emotional support, instrumental support, CBSC, and CPSC.

To replicate a real life model by taking various factors into account, control variables (e.g., demographic factors, psychological factors, lifestyle factors, and stress) were added to the income and health model. This addressed the claim that the social capital-health literature fails to address the complexity and multidimensional aspects of how social cohesion operates on the income and health relationship (Cattell, 2001). That is, social cohesion, income, and health, do not impact the individual in isolation from the biological/psychological processes within the individual nor the contextual environment in which the individual finds her/himself embedded.

Social capital variables had no direct effects on any of the health variables when the control variables were added to the model and thus did not produce any mediating effects. Alternate measures of social cohesion used in this thesis, such as instrumental support, informal group membership, community activities, sense of belonging, trust

neighbours, desire to be involved, healthy neighbourhoods, and neighbouring, also failed to have a significant direct effect on any of the six health variables; thus, these variables did not produce any mediating effects. The social cohesion variables that did have a direct effect on health were limited. Emotional support had a direct effect on emotional health but did not elicit a direct effect on any other health variables. Emotional support produced the only mediating effect on the income and health relationship out of all the social cohesion variables. In addition, fear of crime had a direct effect on GPH but no direct effect on the other health variables. However, fear of crime did not reduce the negative effect that income had on health; thus, failing to provide a mediating effect on the income and health relationship.

The not significant results of social capital on income and health were expected, given the inconsistent literature regarding social capital's effect on health (Islam, Merlo, Kawachi, Lindström & Gerdtham, *forthcoming*). Much research on social capital does not include many other variables in the analysis; leading to an overstatement of the positive attributes social capital may have on health (Macinko & Starfield, 2001). Furthermore, the preliminary bivariate regression analyses run on social cohesion variables and health variables supported this trend in the literature. Trust was found to be a significant correlate of PF, EH, RLEH, and GPH at the $p < .000$ level. Therefore, the use of a multidimensional model in the statistical analyses likely removed any effects social capital may have had on health. In addition, the theoretical conceptualization of social capital may have played a part in it failing to produce an effect on health. Social capital (e.g., formal groups and interpersonal trust) is understood to be a resource leading to social network formation (Putman, 1995). The products of these social networks include

emotional and instrumental support. It is likely that resources (i.e., social capital) in and of themselves do not impact health but the products (i.e., emotional and instrumental support) of these resources may impact individual health outcomes.

The health literature (Cobb, 1976; Corin, 1994) establishes the benefits of emotional support on individual health outcomes. In addition, the social support literature typically conceives of emotional support as a mediator of stress, such as income, on health outcomes. This thesis found that emotional support had a direct and a mediating effect on emotional health outcomes, supporting previous health and social support research. However, it was unexpected that emotional support did not mediate the negative effects of income on other health variables (equally unexpected, was that instrumental support had no effects on health). Furthermore, preliminary bivariate regression analyses on emotional support and health did find that emotional support was a correlate of PF, RLEH, and GPH at the $p < .000$ level of significance; emotional support was a correlate of RLPH at the $p < .001$ level of significance. As well, bivariate regression analyses found that instrumental support was a correlate of all six areas of health at the $p < .000$ level of significance. These findings suggest that social support may not have strong benefits for health when placed in a multidimensional model. The added variables may have overshadowed the effects of emotional support, making it not significant when compared to variables such as perceived stress. However, it is important to note that the mediating effect emotional support had on income and emotional health reduced the effect income had on health to the point of insignificance. As well, considering the multidimensional model used to test for mediating effects, the fact that emotional support did have a mediating effect, even when controlling for demographic factors,

psychological factors, lifestyle factors, and stress, attests to the strength of this variable. When placed in the multidimensional model, emotional health removed the negative effect income had on emotional health. No other social cohesion variable was able to accomplish this.

This thesis found that fear of crime was a correlate of GPH when control variables were added to the model. However, fear of crime did not produce a mediating effect on the income and GPH relationship. No other social cohesion variables (with the exception of emotional support) produced direct effects on health. This finding is consistent with the literature (Chandola, 2001; Franzini et al., 2005), as studies have found that fear of crime influences health negatively. In addition, the significance of fear of crime adds support to the argument that CPSC indicators play a part in individual health outcomes; just not entirely in the way this thesis hypothesized, that fear of crime was an alternative form of social cohesion, which would mediate the income and health relationship. However, results indicate that fear of crime did predict health outcomes in the expected way. The perception of safety is a determinant of health.

When testing the income and GPH model when only control variables were added, a significant reduction occurred in income's negative effect on GPH. IHLC had the largest direct effect on GPH, explaining 6.3% of the variance. When tested for the mediating effects of IHLC it increased the variance explained by income in GPH by 0.3%. Interestingly, when CPSC variables were removed from this model, certain lifestyle factors became significant (e.g., activity level and smoking). This finding indicates that cooperative suppression could be occurring in this analysis. Cooperative

suppression occurs in a model where IVs mutually enhance one another; each IV explains more of the DV together than when added separately (Cohen & Cohen, 1975: 91).

Furthermore, this finding adds credence to the use of a multidimensional model in explaining health. For example, many variables, in this case control variables, together can have a powerful impact on the negative effects of income on health, however separately (e.g., an individual having only high IHLC), these effects are eliminated. Thus, there is no magic indicator (i.e., social capital), when added to an individual's life, that will remove poor health outcomes. Such is the case with smoking and activity level, which were significant when CPSC factors were removed from the model. When CPSC variables were added lifestyle factors were rendered not significant; thus, providing evidence for lifestyle factors not being the sole determinants of an individual's wellbeing. That is, this finding provides evidence against the cultural/behavioural explanation of the health gradient, that is, people are responsible for their health due to the unhealthy behaviours they choose to engage in.

Perceived stress, although not a social cohesion variable, had the greatest direct effect on health. When placed in the income and emotional health model, perceived stress explained close to 50% of the variance in emotional health. The significant effect of perceived stress on the income and health relationship was striking. However, this may be partly explained by the overlap in questions for the two variables; for example, for the emotional health variable, one of the questions asks if the respondent has been a very nervous person, and similarly, the perceived stress variable has a question, which asks the respondent if they have felt nervous and stressed. This thesis used the conceptual framework of Pearlin's (1989) stress process model. Originally, perceived

stress was conceptualized as a control variable (e.g., acute stressor) that may influence health outcomes, but was not expected to have a major impact. However, the results provide valuable insight into how income affects health. Results indicate that the presence of stress in one's life can influence health adversely. As well, the absence of stress can act as an effective mediator; thus, reducing the negative effects income has on health.

The results of research question 2 do not support the claims found in the social capital-health literature that social capital affects health directly and mediates the negative effects of income/status on health. For example, social cohesion conceived as a community-level resource (e.g., social capital) does not directly influence health (with the exception of fear of crime), but social cohesion conceptualized as an individual product (e.g., emotional support) does impact health outcomes and serves as a mediator on the income and health relationship. This begs the question: does social cohesion affect health in another way? Perhaps social capital (community-level resources) create social networks, which in turn create emotional support (individual product), which mediate the income and health relationship. However, these results are unclear as to what mediates stress and its harmful effects on health; this can serve as a useful starting point for future research.

Section 4.3 – Discussion of Results for the Third Research Question: Are Community Psychosocial Social Cohesion (CPSC) Indicators and Length of Residency more Highly Correlated with Social Capital and Community Behavioural Social Cohesion (CBSC) Indicators than Social Inequality Indicators?

The third research question had two purposes. First, all significant social cohesion indicators from research question 2 were to be re-run as dependent variables,

with income as the independent variable (results discussed in subsection 4.3.a). Second, was to test Wilkinson's assertion that social capital variables are determined by income (results discussed in subsection 4.3.b).

4.3.a – Determining What Predicts Social Cohesion

Research question 2 showed that emotional support was the only social cohesion variable that displayed a mediating effect; as emotional support predicted emotional health and reduced the Beta value of income to insignificance. Thus, emotional support was run in a multiple regression as a dependent variable and income as an independent variable. The results of the regression analysis showed that income predicted emotional support; thus, emotional support met all four criteria for a full mediating effect, as emotional support reduced income to insignificance when placed in the regression model.

Emotional support was also predicted by sex, with women having higher levels of emotional support than men. This is supported in the literature on emotional support (Flaherty & Richman, 1989), that women tend to utilize social support more than men do. Of all the health models, sex had no influence on health outcomes. This goes against much of what is discussed in the literature regarding sex and health, as generally, women tend to have poorer health outcomes than men; however, some recent literature does dispute this claim (Macintyre, Ford & Hunt, 1999). This finding could be due to the restrictive age group used in the data sample. Negative health outcomes for individuals tend not to come to fruition until after the age of 65 (Martel et al., 2005). Age was not predictive of any of the health outcomes in this thesis as well; nor was it a correlate of emotional support.

When CPSC variables were added to the regression model on emotional support, trust in neighbours was a correlate of emotional support as well. The social support literature on elders reports that an individuals' use of social support is related to the perception of disorder in their neighbourhood (Thompson & Krause, 1998). That is, accessing social support may be inhibited for individuals who reside in neighbourhoods where the structural and psychosocial environment is not conducive to public interactions (Thompson & Krause, 1998: S355). Trust in neighbours may be an indicator of a neighbourhood where individuals feel safe (e.g., from crime or structural barriers, such as traffic) to go out in public and interact with others; as it is a variable which measures if an individual trusts that their neighbours will look out for them and their family. Social ties with neighbours takes place in the nominal or extended zone of an individuals' social realm; however, emotional support tends to be conceptualized as taking place in the personal and intimate zones (Boissevain, 1974). This finding is interesting, as it suggests that emotional support may be difficult to place in one particular area of an individual's social realm, and emotional support may be received across many areas of an individual's social environment; from the personal to the extended zones. It reinforces the claim by Thompson & Krause (1998) that perception of one's lived environment, more specifically the absence of disorder and the presence of trust, is an important aspect of whether or not individuals have access to emotional support.

Fear of crime was also run in a model as a dependent variable, to further determine its correlates. When social inequality indicators (e.g., income, age, and sex) were added as independent variables in the regression model, only age was significant. Fear of crime was not predicted by income, which was expected considering fear of

crime did not produce a mediating effect on the income and GPH relationship. Sex was not significant, which is contrary to the fear of crime literature that has found women to be disproportionately represented in the category of being fearful of their communities (Pain, 2001). Similarly, the literature reports that those who have low income tend to have higher perceptions of fear of crime in their neighbourhoods (Whitley & Prince, 2005), which was not supported in this thesis. However, age being a correlate of fear of crime is supported in the literature, but not in the direction that this research found. This thesis found that the older an individual was the safer they felt; the literature typically reports that individuals who are older (elderly) are more fearful of crime due to the physical decline in health and the perception that they cannot fend off a potential attacker (McCoy, 1996). It may be that given the age group of the sample used in this thesis (middle age), decline in health is not yet present and thus the perception of an individual being weak and being able to thwart a victimizing situation is not felt. This would be supported by the fact that the sample in this thesis inordinately rated their physical functioning as excellent (approximately 69% rated 90 or higher on a scale of 0 to 100, with higher scores indicating better levels of physical functioning). Nonetheless, this does not explain why younger people would feel more fearful of crime, as found here.

When CPSC variables were added to the social inequality indicators in this model, age became not significant. The only correlate of fear of crime was healthy neighbourhood. That is, an individual who was more likely to rate their neighbourhood as healthy was more likely to feel less fearful of crime. This is supported in the literature, as healthy neighbourhood could be conceived of as an indicator of neighbourhood disorder, which has been shown in previous studies to be a correlate of fear of crime

(Whitley & Prince, 2005). If fear of crime is considered as an alternate measure of social capital, this would help support Wilkinson's treatise that neighbourhood deprivation, as measured by neighbourhood disorder (e.g., healthy neighbourhood), effects social capital levels (e.g. fear of crime). This would be seen as the only example these analyses produced of social capital having a direct effect on health. However, fear of crime did not have a mediating effect on income and health, which does not support Wilkinson's treatise that social capital helps reduce the negative effects of income on health outcomes.

Stress was one of the strongest correlates of emotional health. It was stronger than all of the social cohesion variables. It explained almost 50% of the variance of emotional health. Income predicted stress, stress predicted emotional health and thus stress played a mediating role in the income and emotional health relationship. This is supported in the literature (Marmot et al., 1987; Williams & Lawler, 2001); an individual who experiences high levels of stress does have worse emotional health. The above research suggests that income is correlated with the amount of perceived emotional support an individual has; however, when comparing the variance explained by stress in health, emotional support explains very little. Considering the majority of the social cohesion variables did not produce a mediating effect on health; is it possible that social cohesion variables mediate the stress and health relationship, as opposed to the income and health relationship. This may be the way social support effects health; social support may indirectly affect health through stress alleviation. Wilkinson's treatise proposes this idea; however, the motivation behind a lack of social support/social capital is suggested because low-income individuals lack the necessary social skills (e.g., friendliness) to form social bonds. However, CBSC and formal group membership are not predicted by

income (discussed in following section); thus, Wilkinson's treatise is not supported by this research.

4.3.b – Are Social Inequality Factors better Correlates of Social Capital & Community Behavioural Social Cohesion Indicators than Community Psychosocial Social Cohesion or Length of Residency Variables?

This thesis hypothesized that social capital variables, as well as CBSC variables would be predicted by CPSC and length of residency variables, rather than social inequality factors. The thesis hypothesized that one would participate more in the community if the individual had positive psychosocial beliefs regarding their community, such as, a sense of belonging, healthy neighbourhood, lack of fear of crime, willingness to be involved, and neighbouring (Woldoff, 2002). As well, the thesis predicted that length of residency would be a strong factor in determining social capital levels, as an individual who has lived for a long period of time in a community is more likely to become involved with the community over someone who has only lived in the community for a short period of time (Kasarda & Janowitz, 1974; Bolan, 1997; Sampson, 1998; Woldoff, 2002). Income and other social inequality indicators, such as sex and age, seemed irrelevant as to whether or not someone was to procure social capital, as previous studies have explored social capital attainment at the lower income levels (Frankenberg, 1966; Cattell & Evans, 1999; Cattell, 2001). Despite social capital not having a mediating effect on the several income and health relationships it was still explored in research question 3, as this research question explores a fundamental aspect of Wilkinson's treatise.

Of the social capital variables, interpersonal trust was predicted by income and neighbour trust. It makes intuitive sense that if an individual has a higher interpersonal

trust level this will most likely be reflective of a high trust in one's neighbours to look out for their wellbeing. Some authors of the trust literature question the legitimacy of trust as an indicator of social capital, which in turn produces good health outcomes (Fukuyama, 1999; Forrest & Kearns, 2001), as sometimes, lack of trust is what creates social bonds in communities, e.g., Block Watch Communities. The finding that income predicted trust levels supports Wilkinson's treatise insofar as people with lower income tend to be mistrustful of others. However, interpersonal trust did not have a direct effect on any of the health variables and therefore did not produce a mediating effect on income and health; thus, supporting the thesis' original assertion that social capital variables do not influence individual health outcomes.

Neither formal groups nor informal groups were predicted by income, CPSC, or the length of residency variable, and thus did not have any direct or mediating effect on health. This suggests that income has no bearing on whether or not an individual establishes social networks. This contributes to the evidence that Wilkinson's social capital variables do not have a direct relationship with health. This result may indicate that social capital effects health through another variable; however, that question was beyond the scope of this thesis.

The community activities variable, an alternative measure of social cohesion (Macinko & Starfield, 2001), was predicted best by CPSC variables, rather than social inequality indicators (e.g., income, age, and sex) or the length of residency variable. Desire to be involved and neighbouring were the best correlates of this variable. This makes intuitive sense, as an individual who has a desire to be involved in community affairs would likely attend community events. As well, an individual who knows many

neighbours is likely to socialize with them at community events. However, this logic does not hold true for the other CPSC variables, such as sense of belonging, fear of crime, and healthy neighbourhood. It is likely that if an individual feels a sense of belonging to her/his neighbourhood, they are likely to attend more community events; however, this was not the case. Similarly, if an individual has low fear of crime and believes that her/his neighbourhood is healthy, an indication that the neighbourhood is non-threatening, one could theorize that the individual would be more social in their community; again, this was not the case for the evidence uncovered in this thesis. This is contradictory to the fear of crime literature (Ross, 1993), which suggests that individuals with a strong fear of crime tend to isolate themselves to their homes and not socialize in the community. It is likely these individuals were socializing through other means, which were not examined here, such as, attending events outside of the community or other events in the community which would be classified as informal (e.g., dinner parties with friends, going out for dinner or drinks with friends or family, etc.). In any event, community activities did not have a direct effect on health. Nor did it have a mediating effect on income and health. This could suggest that social cohesion indicators may work indirectly on health through another variable.

Conclusion

Limitations

There are several limitations to the study, which should be taken into account when considering the results of this thesis. First, the thesis conducts an individual-level analysis on the mediating effects of social cohesion on the income and health relationship. Wilkinson's (1996) work focuses on a community or country-level analysis of the data. Although this thesis aims to fill a gap in the social capital-health literature by concentrating on the individual-level, a more telling study would have performed a multi-level analysis, which compared the data at both the individual and community-level. Second, the SES variable and the income variable overlap to a degree, as the income variable is one of the variables used (the other education) in creating the SES variable. If an occupation variable was readily available in the data set, it would have been used to create the SES variable. Since it was not, caution should be taken when comparing and drawing conclusions on the differences in variation explained by SES and income in the various health indicators. Thirdly, lack of representation across the data is of some concern considering the low participation rate, 46%, of the survey. Thus, caution should be applied in drawing any absolute conclusions regarding the results of this thesis.

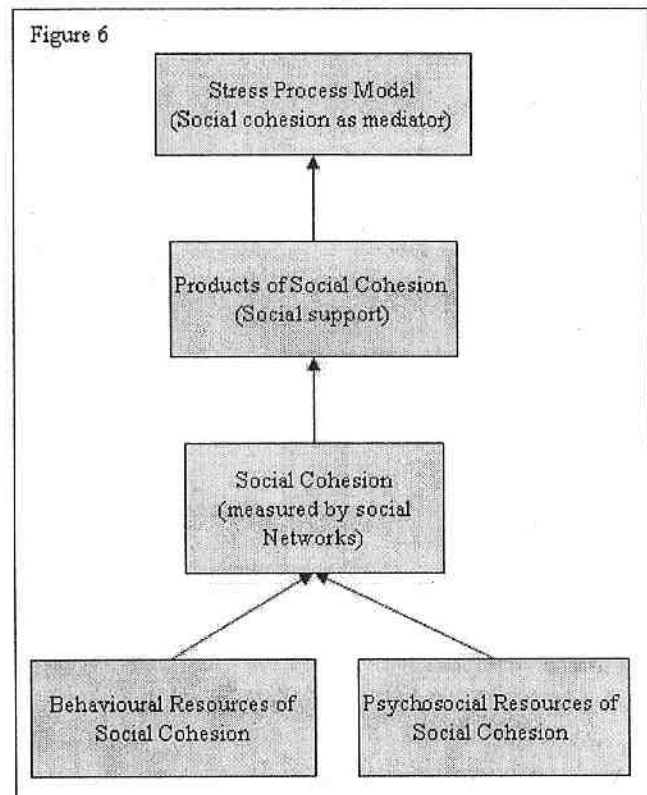
Future Research

The evidence uncovered in this thesis contributes to the social capital-health literature in two important ways. First, absolute income (i.e., annual household income), explains more of the variance in health than income inequality. At the individual-level of analysis, how much income one has, rather than the relative income one has, is more important to an individual's health outcome. That is, what an individual has is more

important for healthier outcomes, than what an individual does not have in relation to another individual. Thus, even in rich industrial countries, the people who make up these societies are still worse off if they have less money. As we move up the social hierarchy these health differences become smaller and in some cases, not present.

Second, social capital

variables do not have a mediating effect on the income and health relationship. Nor does social capital have a direct effect on health. In regard to the other areas of social cohesion (e.g., emotional support, instrumental support, community behavioural, and community psychosocial), only emotional support elicited a mediating effect on



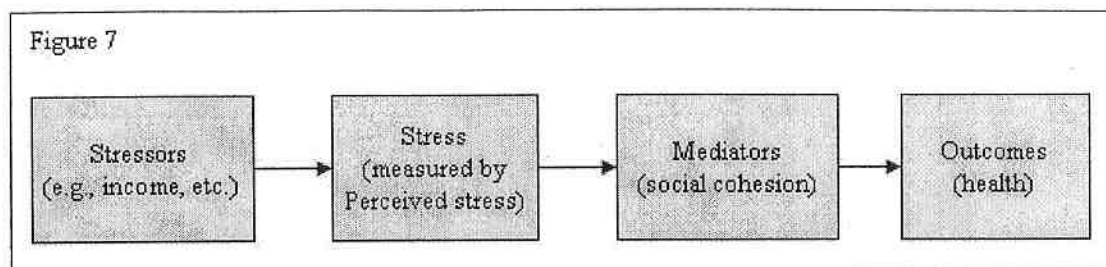
the income and emotional health relationship. Fear of crime, a CPSC measure, had a direct effect on general perceived health but did not have a mediating effect on the income and health relationship. This finding suggests that maybe social cohesion acts upon health in another manner.

The results produced in this thesis suggest several avenues for future research. First, a model (Figure 6) could be utilized which conceptualizes social networks as predicted by community-level behavioural and psychosocial resources. Social networks would produce individual-level products, such as emotional support and instrumental

support. These products of social cohesion would act as mediators on the stress process model. The results of this research suggest that products of social cohesion (i.e., emotional support) act as mediators on the stress process. However, the analyses do not explore in much detail what produces these products resulting from social cohesion, with the exception of psychosocial social cohesion resources and social inequality indicators (e.g., income, age, and sex). Future research could expand on the conceptualization of social networks (e.g., this thesis only looked at number of close friends) to determine which resources predict it and which products social networks produces. This would help to better understand how social cohesion operates on the income and health relationship.

Another area for future research would be to better understand how stress is operationalized in the stress process model. This thesis used a model (the stress process model) that included three areas (stressors, mediators, and outcomes) that described how stress acts on the individual. The perceived stress variable was taken into consideration as a control variable in the stress process model. However, considering the stress process model used in this thesis, the results of this research suggest that the perceived stress variable be added to the model as an additional step (refer to Figure 7). In the revised stress process model, perceived stress (referred to as “stress” in the revised model) would be included after stressors and before mediators. This revised model is similar to Pearlin’s (1990) caregiver stress model, which conceptualizes primary and secondary stressors as constituting “global burden” (587). Pearlin’s (1990) model examines a variety of factors which contribute to burden (i.e., stress) for the individual. Although, the revised stress process model proposed here examines causes of stress (stressors), in terms of socio-demographic factors, the primary focus would be to examine

how the various components of social cohesion mediate the stress (measured with perceived stress) and health relationship.



The results show that stress impacts health considerably and that income predicts stress. Since social cohesion variables had little mediating effect on the income and health relationship, these results suggest an alternative model to the one tested here. This new model could statistically be represented through a PATH analysis; stressors would be independent variables that predict stress, a dependent variable. As well, stress would be an independent variable predicting health outcomes (dependent variable). The various components of social cohesion (resources, social networks, and products) would act as potential mediators on the stress and health relationship.

The impact SES has had on health is shown to be strong in numerous studies (Evans, 1994; Daly et al., 2002). Nevertheless, the avenues by which this relationship occurs have yet to be determined (Adler & Snibbe, 2003). One of the pathways currently researched with respect to the SES-health relationship is the psychosocial pathway (Elstad, 1998). Using the psychosocial pathway to explain the health gradient, according to researchers like Wilkinson (1996), suggests the lower an individual's SES, the less likely s/he is to be socially cohesive and thus the poorer her/his health outcome. This conclusion is primarily derived from the assumption that an individual cannot be socially cohesive under the chronic strain of low SES as they would necessarily feel jealous of

those with higher SES. This jealousy elicits adverse feelings of anger, anxiety, and depression in the low-status individual. This perspective is similar to the stress process model, consisting of stressors, mediators, and outcomes. In the psychosocial pathway perspective, low income substitutes as a chronic stressor on the individual with psychosocial stressors producing a negative impact on the physiological processes of the body. Mediators, such as social support, are less available to the low-income individual because s/he is less likely to be socially cohesive; thus, s/he suffers poor health outcomes. Whereas the high-income earner has less chronic stress, is more socially cohesive, able to access mediators to mitigate the negative impacts of stress; thus, producing better health outcomes for the individual.

This thesis provided a critique of Wilkinson's (1996) income inequality/social cohesion treatise as well as contributed empirically to the social capital-health literature. It improved upon Wilkinson's argument and empirical analysis by adding individual-level indicators and additional behavioural and psychosocial measures to his conceptualization of social cohesion. These improvements to Wilkinson's argument provided a multidimensional approach to understanding the role that social cohesion plays in explaining the income and health relationship. This ensured a more comprehensive understanding of how income influences health outcomes. Moreover, this thesis provided empirical evidence regarding social capital as a determinant of health. Currently, social capital is a concept that is entrenched at the policy level despite the contradictory evidence supporting a correlation of social capital with better health outcomes. Ultimately, this thesis informs discussions about current health policy: is

health policy on the right track or should it refocus its orientation towards more redistributive goals that seek to lessen resource gaps within the population.

The results presented here suggest that social capital is not a social determinant of health. However, emotional support and fear of crime have direct effects on emotional health and general perceived health respectively. Additionally, emotional support mediated the income and emotional health relationship; thus, an individual who has emotional support can reduce the negative effects that income has on health. This has implications for Wilkinson's work and the social-capital health literature; the assumption that social capital has positive effects on health should be reconsidered in terms of its conceptualization as a synonym of social cohesion.

Researchers who are interested in the effects of social cohesion on health should consider broadening their conceptualization of social cohesion from a sole focus on social capital to include individual-level indicators (e.g., social support) and additional behavioural and psychosocial community-level indicators. This enables a more multidimensional approach to understanding how social cohesion effects the income and health relationship. This saves the researcher from drawing erroneous conclusions about the benefits of social capital accumulation and its subsequent positive impact on health outcomes. Without measuring the quality of group membership, the positive benefits cannot be known; indeed, examples of group membership that produced negative effects for individuals and society come readily to mind (e.g. Jews in Nazi Germany). It would be prudent for policy makers to reconsider the concept of social capital and its supposed benefits on health and head back to the proverbial drawing board and ask: what is social cohesion and how does it benefit society? Does social capital accurately reflect the

definition of social cohesion or are there elements missing from its conceptualization?

And most importantly, is social capital a convenient concept to deflect attention away from lack of social spending by governments and shift the blame back on to the individual?

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