Economic Capital, Social Capital and Health in Middle and Later Life

by

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Abstract

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The importance of economic and social capital for health has been well-documented. However, their impact on age-related differences in health is less clear. To address this issue, this study examined the impact of several individual level indicators of economic and social capital on selected health outcomes in middle and later life. Data for the analysis were drawn from the 2008 General Social Survey (Cycle 22) conducted by Statistics Canada. Using a study sample of those aged 45 and over (n=12,135), multivariate regression analyses assessed main, mediating and moderating effects of economic and social capital measures on chronic conditions, health or activity limitations, and self-reported health. The findings indicated that individual level economic capital and structural social capital were positively associated with health status in middle and later life. In addition, the findings revealed the importance of both bonding and bridging forms of social capital in middle and later life. As well, the findings suggest that individual level structural social capital is a more upstream social determinant of health than economic capital in middle and later life as economic capital was found to mediate the social capital-health relationship, but not vice versa. Lastly, no evidence was found for an individual level interaction between economic capital and structural social capital in middle and later life. The theoretical, empirical, and policy implications of these findings are outlined.

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Chapter 1: Introduction

In 1986, Pierre Bourdieu published a paper entitled *The Forms of Capital*. In this paper Bourdieu (1986) argued that capital is accumulated labour which, when appropriated on an exclusive basis, enables individuals to extract social energy in the form of reified or living labour. Furthermore, Bourdieu (1986) argued that four forms of capital constitute "the immanent regularities of the social world" (p.243) and criticized perspectives on capital which tended to signify economic exchange as the sole form of capital in modern society. For instance, he argued that: "It is in fact impossible to account for the structure and functioning of the social world unless one reintroduces capital in all its forms and not solely in the one form recognized by economic theory" (Bourdieu, 1986, p.244). Bourdieu (1986) was further critical of orthodox economics, arguing that it "…is not even a science of the field of economic production…" (p. 245). He elaborated that the economists he had in mind had taken for granted the foundations of the order they claim to analyze, which has "…prevented the constitution of a general science of the economy of practices, which would treat mercantile exchange as a particular case of exchange in all its forms", consequently defining the other forms of exchange (social, cultural and symbolic) as noneconomic and therefore of little interest (Bourdieu, 1986, p. 245).

To overcome this misrecognition of capital, Bourdieu (1986) provided us with a set of concepts representing four forms of capital: economic, social, cultural and symbolic. The first form of capital, economic capital, was defined as "(capital) which is immediately and directly convertible into money and may be institutionalized in the

forms of property rights" (Bourdieu, 1986, p.246). The second form of capital, 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 institutionalized relationships of mutual acquaintance and recognition – or in other words, to membership in a group" (Bourdieu, 1986, p.250). The third form, cultural capital, was originally used by Bourdieu and Passeron (1977) to map patterns of inequality through educational inheritance. Later, in his magnum opus entitled *Distinction: A Social Critique of the Judgement of Taste* (1984), he extended the notion of cultural capital to explain differential rates of engagement in the field of institutionally legitimated arts between the social classes of France. Bourdieu (1986) later clarified the concept, suggesting that cultural capital can exist in three states: embodied, objectified and institutionalized. Embodied cultural capital is capital in the state of long-lasting dispositions of the mind and body; objectified cultural capital is capital in the state of physical cultural goods such as pictures and books; and institutionalized cultural capital is capital in the state of legally guaranteed qualifications, including educational qualifications (Bourdieu, 1986; p.248).

Finally, indebted to Weber's (1922) concept of status group, Veblen's (1899) concept of conspicuous consumption, and Mauss' (1923) concept of gift exchange, Bourdieu demarcated a fourth form of capital – symbolic capital. Symbolic capital is capital which - in whatever guise - must be apprehended symbolically, and hence is more or less misrecognized (1986, p.256). A central aspect of symbolic capital is that economic, social, and cultural capital may go more or less "unrecognized as capital and (thereby) recognized as legitimate competence" (Bourdieu, 1986, p.247). Symbolic capital is related to Bourdieu's concept of symbolic power – the imposition of

unconscious categories of thought, perception and representation upon which social agents reproduce these categories as natural and just (1984). Bourdieu (1990) fiercely opposed the notion of "legitimate competence" – which he cautioned was typified by rational choice and human capital theories that assumed human action was the result of the conscious calculating of competing means towards instrumental ends.

The definitions provided present the forms of capital as discrete – yet Bourdieu indicated that they may well intersect with one another. For instance, Bourdieu (1986) suggested that the forms of capital are fungible – that one form may substitute for another form of capital. In addition, when institutionalized – as is the case for educational qualifications - conversion rates could be established between cultural and economic capital. Furthermore, the lack of conversion between capitals is "nothing other than the denial of the economy" (Bourdieu, 1986, p.244). Bourdieu (1986) suggests that this makes it possible to establish conversion rates between cultural capital and economic capital by guaranteeing the monetary value of a given academic capital.

Drawing upon the forms of capital is useful as they account for forms of social exchange beyond merely those recognized by orthodox economic theory. Hence, these concepts are useful given that the forms may intersect to structure the life choices and chances of individuals and groups. Indeed, researchers have begun employing the concepts to understand social inequalities in diverse fields such as criminology (i.e. Salmi & Kivivuori, 2006), work (Fernandez et al., 2000), education (Israel et al., 2001), health (i.e. Kawachi et al., 1997) and gerontology (i.e. Laporte et al., 2008). However, the forthcoming discussion is limited to two forms of capital, economic and social, and to the academic fields of health and gerontology.

A review of the health literature suggests that research is needed to understand how economic capital and social capital relate to one another to impact health over the life course. Research evidence suggests that economic capital impacts health status indirectly through health-related lifestyles and behaviours, and that this relationship is stratified by age as lower socioeconomic status (SES) individuals begin to experience health problems earlier in life, while higher SES individuals are more likely to begin experiencing nominal health decline closer to or after retirement age. As well, research suggests that social capital affects health status as social connectedness, social participation, voting, trust and associational activity, network structure and features, and social support are associated with health outcomes. However, the relationship between economic and social capital in influencing health at various stages of the life course remains unclear. To date, research that examines the independent and relative impact of economic and social capital on health status has generally found that economic capital explains more of the variation in health status.

Based on this review of the literature, the purpose of the present study was to focus on key relationships which may contribute to our understanding of the impact of these two forms of capital on health in middle and later life. To accomplish this, the study drew on secondary data from the Statistics Canada (2008) General Social Survey (Cycle 22) on social engagement to address questions of whether or not, and the extent to which, economic and social capital accounted for health outcomes among middle-aged and older adults. It addressed their main effects, their importance in mediating the effects of one another in influencing health status, and whether economic and social capital interacted to impact health in middle and later life. While the existence of mediating and

moderating effects has some support, their implications in middle and later life are unclear.

To provide a context for these analyses, Chapter 2 provides us with a literature review on these two forms of capital and how they relate to health for middle aged and older adults. First, literature reviews of economic capital, and economic capital and health are produced. This is followed by a review of literature on social capital, and social capital and health. Third, a review of literature on the relationship between economic and social capital, and between economic capital, social capital and health is produced. Finally, literature on economic capital, social capital and health in middle and later life is examined. Chapter 3 follows with a discussion of the research methods used for these analyses, including the data source that was drawn upon and the sampling, measurement, and data analytic procedures employed. In Chapter 4, the findings are presented. Their implications for addressing the research questions concerning the main, mediating and interactive effects of economic and social capital on health outcomes is addressed in Chapter 5. Finally, Chapter 6 concludes with a discussion of the strengths and limitations of the study as well as the overall implications of the findings for theory, research, policy and practice.

Chapter 2: Review of the Literature

This literature review draws upon inequalities in health literature in order to demonstrate what is known about the ways in which distributions of economic capital and social capital impact health. As well, it reviews literature focusing on economic and social capital in middle and later life, in order to show what we know about the ways in which these forms of capital relate to one another, and relate to impact health across age groups. The first section is dedicated to economic capital and clarifies the importance that material resources play as a major pathway through which health is impacted. The second section is dedicated to social capital. In this section, a distinction is drawn between two major social capital approaches - "communitarian" and "resource-based" - in order to show how social capital has been approached in recent health inequalities research. Similar to research on economic capital, this research clarifies the importance of social capital as a major pathway of health outcomes. It argues for the need to focus greater attention on a resource-based approach to compensate for limitations of the so-called communitarian approach. The third section clarifies how economic capital and social capital jointly impact health status. Finally, the fourth section is dedicated to aging research on economic capital, social capital, and health status. In this final section, the intent is to clarify the importance of the aging process for understanding the contextualization of forms of capital in generating inequalities in health.

Economic Capital and Health

Economic capital refers to "capital...which is immediately and directly convertible into money and may be institutionalized in the forms of property rights..." (Bourdieu, 1986, p.242). Contrary to socio-economic status, which is typically a combination of personal or household income, occupational status and educational attainment, that emphasizes the relative position of an individual in a status hierarchy (i.e. occupational and educational), economic capital emphasizes a broader array of resources which can be directly exchanged into money, including assets and investments. To clarify the distinction, Veenstra (2007) suggests that approaches to the conceptualization of social class in health research typically take one of three forms: (1) social class is equated with socio-economic status; (2) social class is a social group defined primarily by its relationship to the economic mode of production; and (3) social class is a social group defined relationally in social space by its possession and utilization of various capitals. It has been asserted elsewhere (Prus, 2004), that socio-economic inequalities in health largely reflect differential social circumstances that are divided along class lines. However, most research, including Canadian research, focuses on socio-economic status inequalities (Raphael, 2006). Consequently, the relative impact of social class and socio-economic inequalities on the health of Canadians is somewhat unclear (Dunn et al., 2006).

The importance of economic capital for health has been well-documented. Social class and the socio-economic factors associated with it are among those most strongly and consistently related to health within and between countries (Chappell & Penning,

2009). Indeed, the relationship is persistent, having been found for hundreds of years (Humphries & van Doorslaer, 2000), and so strong that associations between social class and/or socio-economic position and health are reported regardless of the specific socio-economic or health measures used to assess the relationship.

The study of the relationship between socioeconomic position and health is widely noted to have its roots in the field of public health. Indeed, public health originally studied the relationship between the social environment and health through the sub-field of epidemiology (e.g. Snow, 1855). However, research on socioeconomic position and health predates the institutionalization of public health and epidemiology. For instance, in *On the Miners' Sickness and Other Diseases of Miners*, Paracelsus (1493-1541), a Swiss physician, documented the unusually high rates of disease amongst miners (Lynch et al., 2000). Three centuries later, Engels (1848) studied the impact of the industrial revolution on working conditions, and how these conditions formed a pathway through which health was impacted. In the same year, Virchow (1848) reported that socio-economic position was a major factor contributing to infectious epidemics of typhus and other illnesses.

In contemporary times, a major focus on socioeconomic inequalities in health was initiated by the Whitehall studies (i.e., Whitehall I and II) conducted in the United Kingdom (UK) and which reported a strong association between civil servant employment status and mortality rates in Britain, an association evident across the entire SES gradient (Marmot et al., 1991). During the 1960s, the main explanation given for these health inequalities was that they resulted from inequalities in access to medical care (House, 2001). The assumption was that medical care was a major determinant of individual and population health, an assumption that served as a major impetus for the

development of universal publicly-funded health care systems within the UK and most other advanced industrialized societies. However, in the 1970s, McKeown (1976) and others began to report findings suggesting that improved health came from changes in living conditions rather than medical advances. Shortly thereafter, *The Black Report* (Black et al., 1980) recognized "the complex effects of the economy and different forms of social organization, including the family, upon levels of health" (p.8). After considering four alternative explanations for health inequalities (artefact, natural/social selection, materialist/structural, and cultural/behavioural), the report argued that materialist/structural explanations were the most plausible in the United Kingdom. Therefore, social class, reflecting living and working conditions, was advocated as a major determinant of health inequalities (Mukhopadhayay, 2008). Both McKeown's (1976) research and *The Black Report* (1980) adopted a materialist explanation of health inequalities, thereby focusing on how living conditions, and the social determinants of health that constitute these living conditions, shape individual and population health (Bartley, 2003).

Materialist explanations of health inequalities exposed the material conditions under which people live, including the availability of resources as they impact health. Succeeding the materialist framework was another analytic framework known as neo-materialism. Neo-materialist explanations accepted the tenets of materialism but extended them, by questioning why material conditions are distributed unequally (Bartley, 2003). Consequently, neo-materialist modes of explanation provide a critique of income distribution models for their lack of emphasis on the social mechanisms that produce and maintain material disparities (Coburn, 2004;[i] Lynch, 2004; Navarro, 2009). For instance,

Navarro (2009) has suggested in a recent criticism of the World Health Organization (WHO) policy document *Commission on Social Determinants of Health* (2008), that "it is not inequalities that kill people, as the report states; it is those who are responsible for these inequalities that kill people" (p.423). In addition, Coburn (2012) has recently argued that we need to understand the political determinants that influence the social determinants of health. A major explanation given today is that neoliberal policies are in large part responsible for increasing inequalities in health by "…destroying collective structures which may impede the pure market logic" (Bourdieu, 1998; p.1).

Research on socioeconomic inequalities in health increased fivefold between 1980 and 1999 (Adler & Ostrove, 1999). Research in the United Kingdom has reported findings indicating that socioeconomic factors such as income have a linear relationship with health at least until the relationship plateaus at very high levels of income (e.g., Benzeval & Judge, 2001; Chandola et al., 2003; Ecob & Smith, 1999). Studies also reveal that socio-economic inequalities in health are not confined to the United Kingdom but instead, are also evident in numerous other countries in Europe (Mackenbach et al., 2008; van Rossum et al., 2000), as well as Australia (Turrell & Mathers, 2000), the United States (House et al., 1990, 1994; Lantz et al., 1998; McDonough et al., 1997; Ross & Bird, 1994), and Canada (Birch, et al., 2000; Denton, et al., 2004; Denton & Walters, 1999; Kosteniuk & Dickinson, 2003). As well, studies reveal that the relationship between socio-economic inequalities and health is one of social causation rather than health/social selection (see Doornbos & Kromhout, 1990 in the Netherlands; Lynch et al., 1997 in Finland; Mulatu & Schooler, 2002 in the United States; and Hirdes & Forbes, 1989 in Canada).[ii]

Overall, current studies suggest that, on average, individuals of lower SES have worse health than their higher SES counterparts (Adler et al., 1993; Antonovsky, 1967; Feinstein, 1993; Feldman et al, 1989; House, et al., 1990; Kitagawa & Hauser, 1973; Marmot, et al., 1984; Pappas et al., 1993; Preston & Taubman, 1995; Townsend & Davidson, 1982). As upstream social determinants of health, social class and/or SES and its components (income, education and occupation) are considered unlikely to have direct effects on health, but rather, to serve as proxies for other more proximal determinants. The processes involved include both differential exposure and differential vulnerability (Angell, 1993; McGinnis & Forge, 1993). For instance, differential exposure suggests that SES influences health status indirectly by producing the financial resources required to support the purchase of good housing, nutrition, private health care and safer working conditions (Roberge, Berthelot & Wolfson, 1995; Segall & Chappell, 2000; Veenstra, 2000), and through psycho-social and health-related lifestyle preferences and behaviours, which in turn, impact health status (Gilmore, 1999; Millar, 1996; Millar & Stephens, 1993; Stronks et al., 1998; Villeneuve, et al., 1994). In contrast, differential vulnerability suggests that SES influences health status indirectly by increasing the negative impact or implications of exposure to various negative influences (e.g., poor housing, lack of nutrition) on health.

This research has begun to clarify the importance of material factors as upstream social determinants of health. The literature has also expressed a need for a neo-materialist explanation of social determinants of health – particularly its political determinants (Coburn, 2012). Although social class, socio-economic status and economic capital are important social determinants of health, other forms of capital have been

found to structure the life choices and chances of individuals and groups, and thereby influence health outcomes.

Social Capital and Health

Until recently, research on inequalities in health has in large part concentrated on economic capital, focusing primarily on individual socio-economic status and/or the resources associated with it, in influencing health outcomes. However, a number of researchers (e.g., Altschuler et al., 2004; Mukhopadhyay, 2008; Muntaner, et al., 1998) have suggested that a model that addresses social inequalities in health should also address the social mechanisms that generate income inequality, rather than solely how income is used to consume various social goods. For instance, Lin (1999) argues that social capital is a major, if not the major, social mechanism which produces and reproduces social inequalities.

In recent decades, social capital has gained serious attention. Drawing upon Bourdieu (1986), social capital has been used to refer to "...the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition..." (p.248). Recent conceptualizations of social capital generally share the premise that social capital is an "investment in social relations with expected returns" (Lin, 2001, p.6). Hence, social structure is a kind of capital that can create competitive advantage in pursuing ends (Burt, 2001). Social capital is the employment of the structure of relations; it is not a possession, but rather a space of difference that qualifies as both a scarce and unequal resource. However, recent scholars consider this an agentive form, insofar as it is interacting

members who make the maintenance and reproduction of social capital possible – thus there is no actor without social capital, while there is no social capital without actors (Lin, 2001). Despite this common ground among scholars, debates persist regarding the concepts: (1) dimensions; (2) forms; (3) levels; (4) causality; and (5) implications.

The reintroduction of the concept in contemporary literature has been associated primarily with the work of political scientist Robert Putnam, and sociologists James Coleman and Pierre Bourdieu. Political scientists (Kawachi et al., 1997; Putnam, 1993) have typically approached social capital as a key characteristic of communities, regions and states rather than of individuals, while sociologists (Bourdieu, 1986; Coleman, 1988, 1990; Lin et al., 2001) have often approached social capital as an individual level resource, including social networks and social support (Nyqvist et al., 2006).

Indeed, social capital is often considered a multidimensional and multiform concept that is typically defined on a micro or macro level. Recent social capital scholars (Bain & Hicks, 1998; Harpham et al., 2002; Krishna & Shrader, 1999; Rothstein, 2003) suggest that social capital can be disaggregated into at least two dimensions: structural and cognitive. Structural social capital refers to positioning in social networks, associations, and other forms of civic engagement, while cognitive social capital refers to perceptions of levels of trust and reciprocity through shared values, norms and attitudes (Baum & Ziersch, 2003). Still others define social capital as a composite of these two types. For example, the Organization for Economic Cooperation and Development (OECD) defines the concept as “networks together with shared norms, values and understandings that facilitate co-operation within or among groups” (2001, p.41).

Further levels have been distinguished beyond simply micro and macro. For instance, Nyqvist et al. (2006) suggest that there are at least four levels of social capital: the macro (historical, social, political and economic contexts), the meso (neighbourhoods and communities), the micro (participation and behaviours), and individual attitudes (psychological). Furthermore, other important levels of social capital have been demarcated - including dyadic (Bowey & Easton, 2007), family (Black et al., 1980) and international (Coburn, 2004).

In addition to distinctions between structural and cognitive dimensions of social capital, theorists generally distinguish between three forms of social capital: bonding, bridging and linking. Bonding social capital refers to cooperative and trusting relations between members of a homogeneous group who make up a network, and who see themselves as being similar in terms of their shared social identity (Putnam, 2000). Bridging social capital is capital that cuts across more heterogeneous groups by providing links to external assets, including the diffusion of information. Finally, linking social capital is capital in which "...vertical connections…span differences of power" (Baum & Ziersch, 2003, p.320). To clarify, a link between two individuals may provide a high level of social support (bonding social capital), meanwhile also opening/reproducing access to socio-structural (bridging social capital) and institutional/political resources (linking social capital).

Currently, two major approaches to social capital dominate the literature: the so-called "communitarian" and "resource-based" approaches. Drawing upon this break in social capital theory will be beneficial to understand how social capital has been

approached to date, and the lack of consensus among recent scholars of the concept in terms of its dimensions, levels, causality, and explanation and implications.

A "Communitarian" Approach

The concept of social capital has an intellectual history dating back to the works of sociologists Emile Durkheim, Ferdinand Tonnies, Georg Simmel, Karl Marx, Max Weber and social philosophers Alexis de Tocqueville and Jeremy Bentham (Farr, 2004; Navarro, 2002) [iii]. However, in contemporary times, it is frequently associated with the work of scholars including the political scientist Robert Putnam (1993). Putnam's approach has been defined elsewhere (Veenstra, 2002; Woolcock & Narayan, 2000) as the communitarian approach to social capital, with a lineage that can be traced back to Alexis de Tocqueville's (1835) views on civic participation. A recent genealogical history (Moore et al., 2006) of social capital in the public health literature, places Putnam's *Making Democracy Work* (1993) along with Kawachi and colleagues' *Social Capital, Income Inequality and Mortality* (1997) as the most cited works in the field. As well, Putnam's book *Bowling Alone: the Collapse and Revival of American Community* (2000) was highly successful, reaching audiences outside academia.

Putnam (1993) defined social capital as "features of social organization, such as trust, norms, and networks that can improve the efficiency of society" (p.167). This definition has been expanded elsewhere (Gray, 2009) to include reciprocity, civic participation and social support. In terms of its dimensions, Putnam's (1993) definition, like that of the OECD (2001), includes both cognitive and structural dimensions. However, Kawachi and colleagues (2004) have suggested that equating social capital

with structural social capital, including its networks and social support, "…would be simply re-labelling terminology, or pouring old wine into new bottles" (p.685). As noted above, much of the social capital research in health has utilized the definitions of Putnam (1993) and Kawachi et al. (1997). Indeed, empirical studies have commonly assessed shared norms, values and attitudes (including perceptions of levels of trust, safety and camaraderie) as indicators of social capital.

In terms of societal levels, these definitions imply that social capital is a characteristic of organizations or communities. For instance, individuals may benefit from living in a neighbourhood with a high level of social participation and/or low crime level, even if one does not participate (Nyqvist et al., 2006). Neighbourhood and community level crime rates and voting behaviour have been commonly utilized as indicators of ecological social capital. Hence, the approach typically affords primacy to its macro-level characteristics. Studies conducted from this perspective have predominantly focused on cognitive features of social capital, assessed at the subjective level and aggregated to the neighbourhood, community or state level (Kawachi, Kennedy & Glass, 1999; Kawachi et al., 1997; Lochner et al, 2003; Lochner, et al., 1999; McCulloch, 2003; Subramanian, et al., 2003).

In terms of its causal pathways, the perceived link between cognitive and structural dimensions varies between scholars. For instance, Rostila (2011) considers trust, norms, social engagement and networks as antecedents of social capital, whereas Fukiyama (2001) regards trust as a form of social capital. Fukiyama's (2001) reasoning has been criticized by Lin (2001), who suggests that this approach offers the formulation of causal properties (e.g., that collective assets such as trust, promote relations and

networks and enhance the utility of embedded resources, or vice versa), but the approach should not assume that these are all alternative forms of social capital or are defined by one another.

Farr (2004) suggests that several theorists have conceptualized social capital as a productive, aggregate fund that is created by shared, public work. From this perspective, social capital serves a function for the economic growth and collective benefits of 'society' as a whole. In fact, it has been suggested elsewhere (Veenstra, 2002) that a link exists between the so-called 'communitarian approach' and the 'consensual' side of sociological theory, tracing the lineage back through structural functionalism to Emile Durkheim's classic study *Suicide* (1897).

Health researchers have further suggested that the mechanisms by which social capital influences health will likely vary according to the level of aggregation (Kawachi, et al., 2007; Kawachi, et al., 2008). For instance, social capital may be measured at the levels of the neighbourhood, group, city, region, community, nation, state or country (Macinko & Starfield, 2001). Kawachi et al. (1999) suggest three ways that social capital may influence individual health: (1) the formal and informal social networks associated with high levels of social capital may help people access health education and information and thereby, lead to improvements in health; (2) social capital may influence health through collective action to design better health care delivery systems; and (3) social support systems may act as a source of individual self-esteem and mutual respect and thereby influence health.

Despite some contradictory findings, several studies have found that social connectedness (Berkman & Syme, 1979; Brown & Harris, 1978; Cobb, 1976; Lynch,

1977), social participation (Kawachi & Berkman, 2000; Shultz et al. 2008), voting (Lofors & Sundquist, 2007), social trust and associational activity (Lochner et al., 2003), and social support (Kim & Kawachi, 2006) are all positively associated with health outcomes as assessed by measures such as self-rated health (Subramanian et al, 2001, 2002), mental health status (Lindstrom, 2004; Scheffler et al., 2007), chronic illnesses (Ahern & Hendryx, 2005; Holtgrave & Crosby, 2006), coronary heart disease (Knox et al., 1998), mortality (Berkman & Syme, 1979; Kawachi et al., 1997; Lochner et al., 2003; Olsen, 1993) and survival (Dalgard & Haheim, 1998; Eng et al., 2002; Konlaan, et al., 2002; Sundquist et al., 2004). For instance, Poortinga (2006) found that ecological level bonding social capital was beneficial for health over and above individual-level bonding social capital. The explanation given was that a high level of social capital within a society generates social cohesion, which in turn, may promote the health of the entire population.

Despite this empirical support, the communitarian approach has been criticized for: overlooking the actual or potential resources that inhere within social networks (Bourdieu, 1986), the differential abilities of residents to access these resources (Morrow, 1999), and the potential negative impact of disparities in social capital on population health (Wakefield & Poland, 2005). The approach has also been criticized for conceptualizing social capital as de-embedded social relations (Lynch et al. 2000), being naively apolitical (Navarro, 2004), abstaining from discussing or defining capitalism and alienation, and universalizing and obscuring gender and ethnic relations (Navarro, 2002). Indeed, Muntaner et al. (2001) argue that within this approach, social capital has often

been presented as an alternative to structured inequalities like class, gender, race and ethnicity, while implying a romanticised view of communities without social conflict.

Farr (2004) expresses similar sentiments, criticizing this approach to social capital as "...a fuzzy, warm, apologetic or nostalgic, middle-class or small town attribute" (p.27). He suggests that while political economists from Karl Marx to Edward Bellamy approached capital from the social point of view (by seeing economic exchange as one of several forms of social exchange), today, social capital theorists have tended to take social exchange from capital's point of view - by seeing social relations as informal and distinct from political and economic power, and merely an instrument to a mutually beneficial model of economic growth (Farr, 2004). The approach has also been criticized for being under theorized and methodologically flawed (i.e. construct validity issues in macro-level analysis) (Carpiano, 2006). Rostilla (2011) raises similar concerns, noting that the perspective is conceptually vague, imprecise, and demonstrates circular reasoning.

A "Resource-based" Approach

In view of the limitations of the communitarian approach, a resource-based approach has been offered as an alternative. The resource-based approach represents an important departure from the communitarian approach in its attempt to accommodate some of its criticisms: (1) recognizing the inter-connectedness between a variety of forms of capital; (2) understanding social capital as (re)producing socio-economic differentiation and intergenerational (dis)advantage (Flora, 1998); (3) acknowledging its ability to produce conflict and negative effects; (4) including an explicit focus on the

origins of social capital - the accumulation of labour under capitalism - and viewing social capital as an instrument of power (an aspect of differential classes rather than society as a whole); (5) emphasizing social relations over ecological characteristics; and (6) adopting a framework more complementary to a "fundamental cause" perspective on health inequalities (Carpiano et al., 2008).

The concept was originally considered and defined as an individual good within sociology (Bourdieu, 1986; Coleman, 1988; Lin, 2000; 2001; Portes, 1998). Three major theorists commonly cited as leading contributors to the development of a resource-based approach to social capital are Pierre Bourdieu (1986), James Coleman (1988), and Nan Lin (2001). From a resource-based approach, social capital is two-sided in that social capital is considered a relational feature of social structure; meanwhile its outcomes are assessed at the individual-level. Again, social capital is defined by Bourdieu (1986) as "...the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition..." (p.248). Like Bourdieu, Coleman's (1990) definition of social capital is relational: "a variety of entities with two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors…within the structure" (p.S98). Lin (2001) further claims that "social capital is defined by resources embedded in one's social networks, resources that can be accessed or mobilized through network ties" (p.73). Hence, social capital theorists have argued for an emphasis on structural social capital, which is rooted in social networks and social relations, and thus must be measured relative to them (e.g., Lin et al., 2001).

To clarify, Lin's (2001) definition suggests that social capital is: (1) the quantity and quality of resources an actor can access or use through a network; and (2) the individual's location in a social network. Similarly, Bourdieu's (1986) definition suggests that social capital has two elements: (1) the relationship itself that allows individuals to claim access to resources possessed by others; and (2) the amount and quality of those resources. Hence, at the individual level, we can assess the amount and quality of resources, and at the relational level, we can assess the structure of social networks.

To understand this two-sidedness of social capital requires understanding Bourdieu's 'relational' social ontology (Wacquant & Bourdieu, 1993). Bourdieu's adoption of Karl Marx's view of the world suggests that "what exists in the social world are not interactions between agents or inter-subjective ties between individuals, but objective relations which exist 'independently of individual consciousness and will'" (1992, p.97).[iv] A similar position is held in high regard by "new" economic sociologists (Burt, 1995; Granovetter, 1985; Polanyi, 1944) who understand human interaction as socially embedded. For example, "new" economic sociologists (Burt, 1995; Granovetter, 1985) have pointed out for some time now that the notion of the human being as an atomistic "undersocialized" actor pursuing their own rational ends is unsupported. Similarly, Bourdieu (1986) argued that "the social world is accumulated history... (thus) one must reintroduce into it the notion of capital and with it, accumulation and all its effects" (p.241). "New" economic sociologists commonly pursue network analysis rather than individual level analysis – a method noted to be more akin to a relational sociology (Emirbayer, 1997). Rostilla (2010) suggests that "embedded social resources can facilitate access to various instrumental and expressive returns, which might benefit both

the individual and the collective" and these "…do not reside within the individual or between individuals (i.e., as intrapersonal or interpersonal resources) but rather, in the structure of their social networks" (p.322). Hence, this suggests the potential for a resource-based model to overcome social capital approaches limited to the collective and the individual level – by focusing on the relational aspects of social resources. However, other analysts focus on social capital as an individual level outcome. For instance, Carpiano (2006) suggests that it would be more useful to conceive of social capital in a more traditionally sociological fashion, that is, as consisting of actual or potential resources that inhere within a social network or group for personal benefit.

From a resource-based approach, social capital is a mechanism through which pre-existing social relations may be reproduced and maintained. Rather than a collective fund for the benefit of the whole 'society', social capital is an individual-level resource based upon differential access which may serve as a site of social reproduction. In this way, Bourdieu emphasized how social capital can be used to produce or reproduce social inequality (e.g., by gaining access to powerful positions through the direct and indirect employment of social connections). Bourdieu emphasized the instrumental advantages to possessors of social capital. Portes (1998) expands that social capital is the "deliberate construction of sociability for the purpose of creating this resource" (p.3). Sociability maintains pre-existing social relations through a continuous series of general exchanges which are not limited to those legitimated through economic theory (Bourdieu, 1986). Thus, social exchange is considered a solid investment since profits may appear in the long run, through their time-lagged conversion into monetary or other forms (Bourdieu, 1986). Social capital then is an investment that works like a credential, enabling

individuals to exchange it as credit. Whereas economic capital gives immediate access to some goods and services, others can be obtained only by virtue of a social capital of relations, which is more or less immediate depending on how well established the relationships are (Bourdieu, 1986).

From the resource-based approach, the volume of social capital possessed by a given agent depends on the size of the network of connections that can be effectively mobilized, and the volume of capital (economic and cultural) possessed by each member in that network of connections, making it a relational concept (Bourdieu, 1986; p.248). For both Bourdieu and Coleman, closure of a group and density within the group are required to mobilize resources (Lin, 2001). Berkman (2000) elaborates further, suggesting that network characteristics cover: range or size, density, boundedness, homogeneity, frequency of contact, multiplexity, duration, and reciprocity.

On the one hand, closed networks comprised of bonding social capital, have been shown to be more advantageous for higher SES individuals insofar as resources can be preserved and reproduced through exclusion. On the other hand, research suggests that bridging social capital comprised of heterogeneous networks is more advantageous to lower SES individuals (Briggs, 2004; Burt, 1992; Ferlander, 2007; Gele & Harslof, 2010; Stephens, 2008), as such networks may provide access to differentially distributed resources which disadvantaged groups generally have less or no access to. In general, network density can be less beneficial to members than networks with a lot of open connections. Indeed, Simmel (1908) long ago noted the dialectic that, "…individuality in being and action generally increases to the degree that the social circle encompassing the individual expands", while "the division of labour demands from the individual an ever

more one-sided accomplishment, and the greatest advance in a one-sided pursuit only too frequently means dearth to the personality of the individual" (p.252).

Since at least the mid-1970s, research findings have suggested that networks may be critical to health (Berkman & Syme, 1979; Blazer, 1982; Bolin et al., 2003; Cassel, 1976; Cobb, 1976; House, Robbins & Metzner, 1982). More recently, social networks have been found to influence health indirectly through facilitating healthy behaviours (Sirven, 2006). Social networks have also been found to influence health status through involvement in associations (Baum, 1999) and interpersonal trust (Rose, 2000). Berkman et al. (2000) raise concern that there has been a lack of research into the influence of social networks on health, suggesting that networks are influenced by provision of social support, social influence, social engagement and attachment and access to resources and material goods.

At the individual level, network measures have become increasingly important for health. For instance, Legh-Jones and Moore (2012) found that higher network diversity was associated with a decreased likelihood of physical inactivity. Individuals who did not participate in any formal associations were more likely to be physically inactive compared to those with higher levels of participation, but generalized trust and the network components of reach and range were not shown to be associated with physical activity. After controlling for social support, Verhaeghe et al. (2012) found that individual level social capital was associated with self-reported health, suggesting that differential access to sets of resources from friends and family are differentially beneficial for health. As well, Brinegar and Jolly (2005) found that respondents

embedded in resourceful social network types reported a lower likelihood of depressive symptoms.

A resource-based approach has also faced criticism. For instance, Coleman's (1990) definition departs from Bourdieu's insofar as social capital is considered to be functional: social capital makes possible the achievement of certain ends that would not be obtainable in its absence. This aspect of Coleman's definition has been criticized as it may implicate a tautology: social capital is identified when and if it works, thus becoming indistinguishable from its outcomes (Lin et al., 2001). As well, Coleman and others have been criticized for assuming that individuals are rational actors consciously seeking to maximize their social capital (Mukhopadhyay, 2008). Lastly, Kawachi and Berkman (2000) criticize the individual notion of social capital, arguing that it should properly be considered a collective characteristic.

As aforementioned, there is considerable disagreement about whether social capital is a collective attribute of communities or societies (contextual), an attribute of individuals (compositional) and/or their social relationships (relational). However, as noted above, social capital theorists do share some common ground. Indeed, Carpiano (2006) suggests that both Putnam and Bourdieu discuss the importance of social networks and share the view that social capital inheres within social networks; however, whereas Putnam emphasizes the social cohesion of networks, and the trust and reciprocity that results for mutual benefit, Bourdieu emphasizes differential access to network resources which results in individual level disparities.

Economic Capital, Social Capital and Health

One of the main criticisms of the communitarian approach is that it has typically failed to address the relationship between various forms of capital. However, Bourdieu (1986) suggests that there are several forms of capital which are also substitutable (Bourdieu, 1986). Therefore, it is important to assess how multiple forms of capital relate to impact health, not merely institutionalized forms (predominately economic) or non-institutionalized ones (predominately social and cultural).

The empirical literature has suggested that taken individually, both economic and social capital impact health. As noted above, from the communitarian approach, studies have found that norms around trust and reciprocity and lower crime rates are beneficial to social cohesion and economic growth as a whole, and these contextual effects ultimately benefit the health of individuals. From the resource approach, studies have found that networks that bridge socio-economic groups are beneficial to lower socioeconomic groups. Yet, less is known about how the two forms of capital relate to one another to impact health. Sirven (2006) has suggested that there is a need to test the causal pathways involving economic capital, social capital and health. As well, Berkman (2000) has suggested that the "upstream" question of identifying conditions that influence the development and structure of social networks has had very little research, including differential access to material goods, resources and services. Recently, researchers have directed more attention to relationships between the two forms of capital, but many aspects remain unclear. Ahnquist et al. (2012) argue that although "social structure" and the "socio-economic patterns" therein are approached as major determinants of population health, very few studies have simultaneously analysed "social" and

"economic" indicators when addressing social determinants of health. This is true both at the individual and ecological levels.

For the most part, research that has assessed the impact that economic and social capital have on health status has been limited to assessing their independent, and hence, relative additive impact. For example, several health researchers (Ahnquist 2012; Baum, 2004; Carlson, 2004; Giordano & Lindstrom, 2010; Pickett & Pearl, 2001; Rose, 2000) have found that social capital has an independent effect on health when controlling for socioeconomic status. For instance, Rose (2000) found that when controlling for one another, both social and economic capital had relatively equivalent, independent effects, in regard to physical and mental health. However, a more consistent finding (Ahnquist 2012; Chappell & Funk, 2010; Humphries & van Doorslaer, 2000; Ichida et al., 2009; Muntaner et al., 2001; Veenstra, 2006; Ziersch et al., 2005) has been that economic capital (typically measured in terms of individual and household income) accounts for a larger portion of the variation in health (assessed using a variety of indicators) than does social capital. For example, at the individual level, Ziersch et al. (2005) found that higher income and educational achievement were related to better physical and mental health outcomes, whereas perceived neighbourhood safety was the only social capital indicator significantly associated with health (with perceived levels of neighbourhood trust not significantly associated with health). As well, Chappell and Funk (2010) found support for a direct relationship between income and mental and physical health, but no main or moderating effects between informal and formal group membership, community activities attended, or trust with any of the three health variables assessed. Similarly, at the aggregate level, Muntaner et al. (2001) have shown that there is a strong inverse

association between multiple social class indicators and depression in spite of dense family networks and low violent crimes in the United States. Also at the aggregate level, Ichida et al. (2009) found that the association between social capital and self-rated health was non-significant after adjustment for economic inequality (assessed using the Gini coefficient).[v]

To assess the 'fungibility' of economic and social capital as they relate to health is to assess whether a mediation effect exists. To date, there is some evidence for mediation effects (e.g., Altschuler et al, 2004; Bolin et al. 2003; Elgar et al. 2010; Ichida et al. 2009; Kawachi et al., 1997; Kondo et al., 2011; Schultz, 2008; Sirven, 2006; Veensta 2002). At the aggregate level, mediation effects were first reported by Kawachi et al. (1997), suggesting that social capital in communities may mediate the relationship between income inequality and health status. As well, Kim and Kawachi (2007) found that state-level social capital (defined in terms of a 14 indicator state-level social capital index, including voting and organizational forms of civic participation) mediated the individual income and self-reported health relationship. Ichida et al. (2009) also reported similar results, suggesting that social capital mediates the relationship between income inequality and health. Altschuler et al. (2004) found that bridging social capital tends to be greater in neighbourhoods of higher SES which allows them greater success when mobilizing to improve their neighbourhoods and health. Studies (Niemenen et al., 2008; Schultz, 2008) have found that higher income groups tended to have more social capital than other persons. Sirven (2006) found that an increase in head of household income raises the probability of households participating in associations, contributing to collective actions, and getting involved in a social network. Bolin et al. (2003) found that wealthier

households can spend more resources to accumulate social capital. Further, Elgar et al. (2010) found that increased social capital reduces socio-economic disparities in children's physical health at the individual level. As well, Veenstra (2002) found that income inequality was not as strongly related to age-standardised mortality after controlling for social capital, and vice versa. However in a later study, Veenstra and Patterson (2012) found no support for mediation effects involving the impact of social, cultural and economic capital on mortality. Other studies (Dahl & Malmberg-Heinomen, 2010; Nakhaie, M. et al., 2007; Van der Wel, 2007; Wu, 2010) have also found no evidence of mediation effects between economic and social capital. Similarly, at the individual-level, Lindstrom et al. (2001) found that social capital mediates the socioeconomic status and physical activity relationship.

There is a lack of evidence assessing the reverse pathway – that is, whether economic capital mediates the social capital-health relationship. Another recent issue in the literature is whether economic and social capital interact to influence health. This includes interactions that are likely to have a protective effect on health – for example, when social capital buffers the negative implications of a lack of economic capital or vice versa. Some evidence for a moderator effect is available. For instance, at the individual level, Sun et al. (2009) found an interactive effect between poverty and a lack of social capital on self-rated health (SRH), where the poor had a higher probability of belonging to the low social capital group, suggesting that policies that attempt to improve health equity via social capital, but neglect poverty intervention, would be counter-productive. As well, Ahnquist et al. (2012) found evidence of an interaction effect with a combination of low social capital (social participation, and interpersonal and

political/institutional trust) low economic capital being associated with a higher risk of poor health.

Economic and Social Capital and Health in Middle and Later Life

Although there is some evidence of main, mediating and moderating effects of economic and social capital as they pertain to health status, there is a need for research to assess the individual and joint implications of economic and social capital in influencing individual and population health at different stages of the life course (Ahnquist et al., 2012; Frytak et al., 2003; O'Rand, 2006). For example, it has been suggested (Nyquist et al., 2006) that individual level studies can clarify the relationship between social capital and health, especially in rarely studied groups.

In recent decades, identifying and explaining patterns of resource accumulation across the life course has become a major area of research. Research has shown that socio-economic factors are closely linked to health in middle and later life (Cairney, 2000; Cairney & Arnold, 1996, 1998; Hay, 1988; Hirdes & Forbes, 1989; Hirdes et al., 1986; Mustard et al., 1997; Wilkins, et al., 1991; Wolfson et al., 1993). For instance, Cairney (2000) found that one-third of the variation in the self-reported health of those aged 55 and over could be explained by income inequality. As well, in Canada, Wolfson et al. (1993) found that a SES and mortality gradient exists for males aged 65-75. Furthermore, it has been reported that lower SES individuals often begin to experience health problems shortly after adolescence, while higher SES individuals experience little health decline until around retirement age (House, 1990; 1994). Specifically, longitudinal research has shown that individuals with higher education and incomes have lower rates

of morbidity and mortality, higher self-reported health status, and are more likely to experience compression of morbidity which results in deferring health problems until later in life (Prus, 2004).[vi]

Research has found that social capital may accumulate (Bridges & Villemez, 1986), or accumulate and then depreciate (Erickson, 2003; Lambert et al., 2006; Mcdonald & Mair, 2010) over the latter half of the life course. However, the transition from middle life to later life is generally said to be marked by an overall decline in social capital (Coleman, 1990; Cornwell et al., 2008; Kalmijn, 2003; McDonald & Mair, 2010; Wellman et al., 1997). In addition, although social capital has also been linked to health status at all ages (e.g., Frytak et al., 2003), it may be of particular importance in later life in supporting older adults to remain independent despite the onset of chronic conditions and disability (Antonucci, 2004; Kendig, 1986). Considering that older people have more time to take part in social activities due to retirement (Christoforu, 2005), and/or fewer familial constraints (Bolin et al., 2003), it may be that social capital is a stronger health determinant in later life.

Although no studies appear to have addressed the impact of social capital on health in mid-life, numerous studies attest to the importance of social capital for health in later life. For example, Litwin and Shiovitz-Ezra (2011) found that among those aged 65 and over, respondents embedded in network types characterized by greater social capital tended to exhibit better well-being in terms of less loneliness, less anxiety, and greater happiness. Litwin (2003) found that retirees in diverse networks (i.e., networks characterized by a greater number of family and friends who provide social capital) had the highest likelihood of all the network types of engaging in physical activity, and those

in exclusively family or restricted networks had the lowest. In addition, Legh-Jones and Moore (2012) found that older individuals (aged 65+) who did not participate in any formal associations were more likely to be physically inactive compared to those with high levels of participation, suggesting that network diversity mediated the association between social participation and physical inactivity. Litwin (2011) found that respondents aged 65-85 who were embedded in resourceful social network types in terms of social capital reported fewer depressive symptoms. However, concerns have been raised that this body of literature on older adults' networks has concentrated predominantly on bonding social capital (Barr, 2002). As a result, less is known regarding the impact of bridging and linking social capital in middle and later life.

Research suggests that economic and social capital have independent effects on health in middle and later life. For example, in a sample of individuals aged 65 and over in China, van Norstrand and Xu (2012) found that when controlling for sociodemographic variables, income, bonding and linking social capital were significant predictors of physical and emotional health when controlling for one another in the same model. Similarly, in a sample of older adults (aged 65+) from Spain, Karlsdotter et al. (2011) found that when including income and social capital indicators in the same model, both were significantly related to self-reported health for women but not for men. Finally, according to findings reported by Ahnquist (2012), among age groups ranging from 16-84, a lack of both economic and social capital increased the odds of reporting poorer health (Ahnquist, 2012).

Although no studies appear to have addressed the mediation of economic capital and social capital on health in middle and later life, some attention has been paid to the

importance of interactions between economic and social capital for health in middle and later life. For example, Frytak et al. (2003) found that for middle-aged adults (aged 51-64), social capital works differently in protecting the health of lower SES individuals than higher SES individuals. For lower SES individuals, social capital was found to have a positive indirect impact on health status through risk factors whereas economic capital was found to have a positive direct impact on health status. For high SES individuals, social capital, but not economic capital, had a positive direct impact on health.

Statement of Research Objectives

The preceding literature review examined the importance of both economic capital and social capital in influencing individual and population health outcomes. It revealed a need for additional research that examines how economic and social capital relate to one another to impact health, including in the middle and later years of life. When both are considered at the individual level, their independent effects are fairly well-documented. Both are found to have a positive relationship with health status, with economic capital generally reported to have a greater impact than social capital. However, their mediating and moderating effects are much less clear, particularly as they relate in the latter years of the life course to affect health.

In accordance with Bourdieu (1986) and Lin et al. (2001), a resource-based approach to social capital appears to hold particular promise for an understanding of health inequalities in middle and later life. It focuses on differential access to social resources, including social networks. Second, it focuses on group differences rather than aggregate-levels of association, seeing whether/how the consequences of group

differences in civic participation matter for health, rather than whether/how civic participation is advantageous to society as a whole (as in the communitarian approach). According to Lin et al. (2001), civic participation is not a type of social capital but rather, an outcome of structural features of networks (Lin et al., 2001). A resource-based approach reflects a view of social capital, not as an alternative to structural inequalities, but rather as one of several forms of social exchange (Muntaner et al., 2001). Therefore, as noted by Elder and Shanahan (2006), it is necessary to understand how the accumulation, maintenance, and erosion of resources are linked to age-related processes in order to fully understand inequalities in health.

There also appears to be a need for research that disaggregates social capital by form (bonding, bridging, and linking), especially in later life where studies on bonding social capital (e.g., social support literature) predominate. An individual-level, resource-based approach to bonding and bridging social capital is an important step toward understanding how social capital and economic capital impact health in middle and later life.

To address these needs, this study focuses on how individual-level economic and social capital impact individual health status in middle and later life. The central research questions are as follows:

1) To what extent do economic capital and social capital independently account for differences in health status among middle-aged and older adults?
2) To what extent do economic capital and social capital mediate one another in influencing health status among middle-aged and older adults?

3) To what extent do economic capital and social capital interact to impact health status among middle-aged and older adults?

The first question assesses whether and to what extent both economic capital and social capital, taken individually, influence health status in middle and later life. Consistent with prior studies, it is expected that those in advantageous socio-economic positions would have better health status, and that age-related declines in economic capital would, in part, account for the declines in health associated with advancing age. It is also expected that social capital would decline in association with the transition from middle life to later life and that age-related declines in social capital may also account for some of the declines in health associated with advancing age. Consistent with prior studies, where both economic and social capital are considered, it is expected that economic capital will explain more of the variation in health status than social capital.

The second question considers how social capital impacts health through economic capital, and how economic capital impacts health through social capital in middle and later life. Specifically, it examines whether the impact of age-related differences in access to social capital on health operates through access to economic capital (i.e., whether differences in levels of social capital are associated with differences in economic capital and thereby influence health) as well as the reverse (i.e., whether differences in economic capital also are associated with differences in social capital and thereby influence health). Consistent with prior studies, it is expected that social capital will mediate the economic capital-health relationship. Research is just beginning to suggest that the reverse (i.e., that economic capital mediates the social capital-health

relationship) is plausible. Thus, it is expected that economic capital will mediate the social capital-health relationship.

Lastly, the third question examines whether economic and social capital interact with one another to influence health in middle and later life. That is, to what extent do high or low levels of access to one form of capital intensify the positive or negative health implications of high or low levels of access to another form of capital in middle and later life? Based on previous literature, it is expected that having more social capital, especially bonding social capital, will function to buffer the negative implications of low economic capital in later life. Whether this applies to other forms of social capital (e.g., bridging, linking) is unknown as is whether economic capital also serves to buffer the negative implications of low social capital.

Chapter 3: Methods

Data Source

The data source used for this study was the Statistics Canada General Social Survey (GSS) Cycle 22 (2008) public use file. Since its inception in 1985, the annual GSS has completed over twenty cycles. The GSS gathers data on social trends in order to monitor changes in the living conditions and well-being of Canadians over time and to provide information on specific social policy issues of current or emerging interest (Statistics Canada, 2008).

To date, it is typical for social capital studies to use secondary statistical analysis of existing datasets, which were generally not collected specifically to measure social capital (Barr & Russell, 2007). Statistics Canada has dedicated two GSS cycles to the topic of social engagement: Cycle 17 (2003) on social and civic participation, trust, and reciprocity, and Cycle 22 (2008) on social networks, social and civic participation, and life changes. Of these, Cycle 22 is the logical choice for an individual level study on resource-based social capital. The justification for using the Cycle 22 dataset over the Cycle 17 dataset is twofold: relevance and recency. In terms of relevance, the questionnaire includes social network measures such as indicators of amount of close contacts, frequency of contact with close contacts, indicators of civic participations, as well as the potential to create indices of people known to the individual in terms of their position in the Canadian occupational structure (Lin et al., 2001). Indeed, the dataset has been described elsewhere as being ideal for social capital studies as it thematically

focuses on social networks (Carpiano, 2011). In addition, Cycle 17 precedes Cycle 22 by five years, making the Cycle 22 data more time sensitive.

Data for Cycle 22 were collected between February and November, 2008. The questionnaire collected cross-sectional data utilizing random digit dialling (RDD) and computer-assisted telephone interviewing (CATI). The telephone numbers in the sample were selected using the Elimination of Non-working Banks technique. This is a method in which an attempt is made to identify all working banks for an area (i.e., to identify all sets of 100 telephone numbers with the same first eight digits containing at least one number that belongs to a household) (Statistics Canada, 2008). Thereby, all numbers within non-working banks were eliminated from the sampling frame. In order to carry out sampling, each of the ten provinces was divided into strata (e.g., geographic areas) and many of the Census Metropolitan Areas (CMAs) were considered separate strata. This was the case for CMAs including: St. John's, Halifax, Saint John, Montreal, Quebec City, Toronto, Ottawa, Hamilton, Winnipeg, Regina, Saskatoon, Calgary, Edmonton and Vancouver. Additional CMAs not on this list were located in Quebec, Ontario and British Columbia. Three more strata were formed by grouping together the remaining CMAs in each of these three provinces. Finally, the non-CMA areas of each of the ten provinces formed ten more strata, resulting in 27 strata in total (Statistics Canada, 2008).

Coverage of the targeted population is estimated to be more than 92% complete as rates of telephone service are very high in Canada (Statistics Canada, 2008). These rates are high for virtually all socio-demographic groups, but are lowest among those households with the lowest incomes. As a result, persons living in such households are

slightly under-represented. In addition, while every effort was made to avoid non-response, the non-response rate for GSS-22 was 42.7% (Statistics Canada, 2008).

Sampling

The GSS target sample size was 25,000 individuals selected across ten provinces.[vii] Persons excluded from GSS samples included: those living in the Yukon, Northwest Territories, and Nunavut; persons with cellular phones only (6.4% of target pop.); institutionalized Canadians; and persons without a home phone (0.9% of target pop.) (Statistics Canada, 2008). The Cycle 22 dataset contains questionnaire responses and associated information from 20,401 respondents aged 15 and over. However, given this study's focus on middle to later life transitions, a subsample consisting of those aged 45 and over was drawn (n=12,135). The sample included 7,714 individuals aged 45 through 64 years (considered middle life) and 4,421 individuals aged 65+ (considered later life).

In the GSS, the principle behind estimation is that each person selected into the sample represents several other persons not in the sample (Statistics Canada, 2008). Estimation is conducted through the use of a weight factor applied to each sampled person. Two weight factors were available in the dataset. The first was a basic weight factor for analyses conducted at the individual level, and used to calculate estimates of the number of persons in the total population having one or several given characteristics (Statistics Canada, 2008). The second was a household weight which can be used to estimate household characteristics (Statistics Canada, 2008). For this study, an adjusted person-level weight was applied which maintained individual level estimates, while

adjusting the sample size to its original size rather than to the size used for purposes of national population estimates.

In addition to the estimation weights, Statistics Canada created bootstrap weights for the purpose of design-based variance estimation. Sampling implies standard error; that is, estimations based on a sample will vary from sample to sample, and will differ from a complete census (Statistics Canada, 2008). Indeed, application of standard methods to survey data without accounting for the design features and weight adjustments can lead to erroneous inferences. To adjust for this, bootstraps were applied using Stata12. Bootstrapping is a general approach to statistical inference based on building a sampling distribution for a statistic by re-sampling from the data at hand (Fox, 2002). The use of bootstrap weights allows researchers to make use of complex survey design information and calculate more reliable variance estimates.

Measurement

The main independent and dependent variables included in the analyses were: age, social capital (bonding and bridging), economic capital (household income and dwelling ownership), and health status (chronic conditions, health or activity limitations, and self-reported health). Control variables that previous research suggested were likely to be important to relationships between economic or social capital and health, and that were therefore included in the study as well were: gender, education, visible minority status, aboriginal status, immigrant status, rural/urban residence, province of residence, religious group participation, and employment status. The distributional characteristics of each variable are shown in Table 1.

Table 1: Sample Characteristics: Middle-aged and Older Canadians (Age 45+)

Variable	Frequencies*	Means/Percents	
Age			
45 to 49	1,953	20.36	
50 to 54	1,996	18.6	
55 to 59	1,986	15.9	
60 to 64	1,779	13.28	
65 to 69	1,401	9.82	
70 to 74	1,071	7.7	
75 to 79	888	6.4	
80 years and over	1,061	9.74	
Social Capital			
Number of Close Contacts	11,784	11.79	
Frequency of Contact	11,947	3.52	
Highest Prestige Assessed	12,017	8.41	
Total Assessed Prestige Score	11,787	501.29	
Number of Positions Assessed	11,787	9.17	
Range of Prestige Scores	11,977	15.09	
Civic Participation: Number of Organizations	12,104	1.33	
Civic Participation: Activity in Organizations			
1) Not in the past year	5,225	42.66	
2) Once or twice a year	1,451	13	
3) Once a month	1,649	13.91	
4) A few times a month	1,353	10.68	
5) At least once a week	2,430	19.75	
Economic Capital			
Household Income			
1) No income or loss	37	0.31	
2) Less than $5,000	35	0.23	
3) $5,000 to $9,999	189	1.01	
4) $10,000 to $14,999	516	3.21	
5) $15,000 to $19,999	528	3.84	
6) $20,000 to $29,000	1,202	10.08	
7) $30,000 to $39,000	1,136	10.27	
8) $40,000 to $49,000	993	9.79	
9) $50,000 to $59,000	912	9.81	
10) $60,000 to 79,000	1,330	15.28	
11) $80,000 to $99,999	867	10.88	
12) $100,000 or more	1,761	25.3	
Dwelling Ownership			
1) No	2,530	16.86	
2) Yes	9,435	83.14	
Health Status			
Number of Chronic Conditions	12,135	1.42	
Activity Limitation			
1) No	6,171	53.95	
2) Yes	5,873	46.05	
Self-Reported Health			
1) Poor	624	4.74	
2) Fair	2,007	15.46	
3) Good	3,982	33.77	
4) Very Good	3,413	28.05	
5) Excellent	2,006	17.98	
Control Variables			
Gender			
1) Male	5,126	48.08	
2) Female	7,009	51.92	

Table 1: Sample Characteristics: Middle-aged and Older Canadians (Age 45+) Cont.

Educational Attainment			
1) Elementary/No Schooling	683	5.16	
2) Some Secondary/High School	2,135	16.31	
3) High School Diploma	1,865	15.84	
4) Some Trade/Technical	477	3.94	
5) Some Community College/CEGEP/Nursing	406	3.81	
6) Some University	617	4.67	
7) Diploma/Certificate from Trade/Technical	1,456	11.72	
8) Diploma/Certificate from Community/College	1,707	14.56	
9) Bachelor's Degree	1,804	16.09	
10) Doctorate/ Masters/Some Graduate	805	7.9	
Aboriginal Status			
1) Non-Aboriginal	11,567	97.36	
2) Aboriginal	695	8.87	
Visible Minority Status			
1) Non-Visible Minority Status	11,217	91.13	
2) Visible Minority Status	695	8.87	
Immigrant Status 1			
1) Everyone Else	11,995	99.12	
2) Less than 10 Years	106	0.88	
Immigrant Status 2			
1) Everyone Else	10,127	80.2	
2) 10+ Years	1,974	19.8	
Urban/Rural Residence			
1) Larger Urban Centres (CMA/CA)	8,806	78.1	
2) Rural and Small Town (non-CMA/CA)	3,329	21.9	
Province of Residence			
1) Newfoundland	617	1.7	
2) Prince Edward Island	316	0.44	
3) Nova Scotia	677	3.08	
4) New Brunswick	604	2.46	
5) Quebec	2,358	24.63	
6) Ontario	3,578	38.06	
7) Manitoba	703	3.46	
8) Saskatchewan	616	2.98	
9) Alberta	953	9.25	
10) British Columbia	1,713	13.95	
Wage Labour			
1) Everyone Else	7,544	58.22	
2) Wage-Labourer	4,586	41.78	
Job Autonomy			
1) Everyone Else	10,754	87.32	
2) Self-Employed	1,376	12.68	
Religious Organization Participation			
1) Not at all	4,462	38.2	
2) At least once a year	1,033	9.2	
3) A few times a year	2,223	18.78	
4) At least once a month	1,284	11.02	
5) At least once a week	2,881	22.8	
Source: 2008 Canadian General Social Survey (GSS-22)			
*Table presents non-mi dataset with unweighted frequencies and weighted means and percentages			

Independent Variables

Age

Respondents were asked their age in chronological years. However, given its availability within the public use data, a measure of chronological age coded into five year age groups (seven groups from 45-79), with the last group truncated at 80+ years of age, was used. Five to ten year age groups have been widely accepted in previous studies for reasons of practicality and convenience (Boscoe, 2008). To account for the possibility of curvilinearity, a square transformation of age was also employed. Skewness and kurtosis statistics, for both the uncorrected and corrected age variables along with other variables, are reported in Table 2. Scatterplots were also assessed for the uncorrected and corrected age variables indicating greater linearity of the corrected measures. An assessment of the frequency distribution (see Table 1) shows that 50-54 was the largest five-year age group and 75-79 the smallest. Over two-thirds (68%) of the sample was middle-aged (45-64), while just under one-third (32%) were older adults (aged 65+).

Table 2: Original and Corrected Skewness and Kurtosis Statistics

Variable	Skew	Corrected	Kurtosis	Corrected
Age	3.33	0.66	-1.29	2.35
Number of Close Contacts	6.19	0.95	62.33	2.98
Frequency of Contact	-0.07		2.6	
Highest Prestige	-3.56	0.89	15.67	2.68
Number of Positions	-0.19		2.09	
Range of Prestige	-2.05	0.27	6.24	1.73
Civic Participation: Number of	2.84	1	21.94	3.14
Civic Participation: How Often	0.47		1.64	
Household Income	-0.55		2.39	
Number of Chronic Conditions	1.05		4.22	
Self-Reported Health	-0.21		2.38	

Social Capital

To measure the relational aspect of resource-based social capital, dyadic network data which maps network characteristics through social network analysis can be employed. In addition, Lin (2001) suggests that a resource-based approach to social capital also can measure social capital through the use of egocentric data from conventional social surveys which measures the amount or variety of characteristics in others, who may facilitate resource acquisition, and with whom the individual has direct or indirect ties. Through these ties, three forms of social capital (bonding, bridging and linking) can facilitate resource acquisition and reproduction (Lin et al., 2001). Here, egocentric social survey data were used to assess indicators of bonding and bridging social capital, but not linking social capital. Linking social capital was not included as it is a more difficult concept to measure with traditional survey data because it involves contacts or networks specific to populations of sub-groups not available in the GSS (Bryant & Norris, 2002).

Bonding Social Capital: As noted, bonding social capital tends to be defined in terms of strong ties (Barr, 2002), including cooperative and trusting relations between members of a homogeneous group who make up a network, and who see themselves as being similar in terms of their shared social identity (Putnam, 2000). To measure bonding social capital in this study, two indicators were used: number of close contacts and frequency of contact with those close contacts. These were expected to yield meaningful egocentric information regarding the individual's size and extensity of strong network ties.

To assess number of close contacts, a composite measure was constructed which summed the number of close relatives and friends an individual reported having. Respondents were asked: "How many relatives do you have who you feel close to?" and "How many close friends do you have?" The actual number of contacts reported was then recorded. As these questions did not distinguish between non-spousal and spousal contacts, they were assumed to include spousal contacts. For the number of close relatives, a mean of 7.44 was obtained while, for the number of close friends, a mean of 6.31 was obtained. The overall mean for the combined measure was 11.79. The zero-order correlation between the two close contact variables was 0.192. The number of close contacts showed a positively skewed distribution (skewness=6.19) with a kurtosis of 62.33 (see Table 2). To correct for the large positive skew and presence of outliers, observations above 30 were truncated (i.e., recoded into a "30 plus close contacts" category). Corrected skewness and kurtosis statistics indicate this was successful (see Table 2).

To measure frequency of contact with close contacts, a composite measure was derived from six variables which asked respondents how often they communicated in person, over the telephone, and/or over the internet with both family and close friends. Respondents were asked "How often do you communicate with (family/friends) over the (telephone/internet/in person)?" The response categories were: (1) Not in the past month, (2) Once a month, (3) 2 or 3 times a month, (4) Once a week, (5) A few times a day, and (6) Every day. Bivariate correlations among the variables ranged from .022 to .506, with the lowest correlation evident between frequency of contact with relatives in person and frequency of contact with relatives over the internet, and the highest correlation being

between frequency of contact with friends on the phone and frequency of contact with friends in person (Appendix A). The composite measure was created by adding the six items together, then dividing the total score by six, which produced an average score ranging between 1 and 6. The combined measure was normally distributed (see Table 2) with an overall mean of 3.52, indicating that the average frequency of contact with close contacts for the sample fell between two or three times a month and once a week.

Bridging Social Capital: There are two methodologies commonly used to measure access to bridging social capital or capital that cuts across more heterogeneous groups and provides links to external assets. These include name generators and position generators (Lin et al., 2001). The GSS Cycle 22 contains a 'position generator of respondent' (PGR) module, further developed by Erickson (2004), which has been used in recent social capital studies in health (e.g., Carpiano, 2011). PGRs use a sample of ordered structural positions (such as occupations, authorities, work units, classes or sectors), and ask respondents if they know anyone in each assessed position (Lin et al., 2001). From these responses, it becomes possible to establish indices that reflect: (1) the range of accessibility to different stratified positions in the social structure (based on the difference between the highest and lowest assessed prestige scores); (2) the extensity or heterogeneity of accessibility to different positions (based on the sum of the number of positions assessed as known to the individual); (3) the upper reachability of the network (based on the highest score assessed); and (4) the total prestige of the network (based on the sum of prestige scores assessed) (Lin et al., 2001). Although these indices do not distinguish the strength of ties, they yield meaningful information regarding the

individual's potential and actual access to structurally embedded resources based upon 'knowing' individuals in the occupational status hierarchy (Lin et al., 2001).

In the United States, an occupational status score scale was developed by Nam et al. (2000) known as the Nam-Powers-Boyd scale. With a recent Canadian adaptation, Boyd (2008) produced a scale from the occupational data collected in the Canadian 2001 census of population, using the educational and earnings properties of specific occupational titles. The GSS Cycle 22 survey asked respondents whether they knew anyone in eighteen different occupations. Using the Boyd (2008) scale, these occupations were ordered hierarchically by occupational status scores (i.e., High: engineers [status score = 94], Medium: graphic designers or illustrators [status score = 67], and Minimum: labourers in landscaping and grounds maintenance [status score = 11], and sewing machine operators [status score = 11]) (Appendix E).

For the present study, four measures of bridging social capital were constructed. First, an index measuring the range of prestige scores was constructed based on the distance between the highest and lowest assessed positions. For instance, a person who knew both a sewing machine operator [11] and an engineer [94] would have the highest possible range (94-11=83). In contrast, a person whose only occupational contacts included engineers (94-94=0), sewing machine operators (11-11=0), and those who reported knowing no one equalled zero. The scores obtained for the study sample ranged from 0 to 83, with the mean score of 15.09. However, 4,735 (39.0%) of the sample received the highest value, resulting in a skew of -2.05 and a kurtosis of 6.24 (see Table 2). To correct for this large negative skew and hence outliers, the variable was transformed prior to analysis resulting in a positive skew, and then logged to correct for

skewness (see Table 2). In order to assess the validity of the indicator, the correlation between range of prestige and educational attainment was compared between the sample drawn and other studies[viii]. In other studies, the two indicators were moderately correlated with a correlation of 0.41 (Van Der Gaag et al., 2004) and 0.48 (Lang & Roessl, 2010). In the sample drawn, range of prestige and education were moderately correlated with a correlation of 0.24, providing some evidence of validity.

To measure the extensity or heterogeneity of accessibility to different positions, the total number of positions in which the respondent reported knowing someone was determined. The extensity index has been suggested elsewhere (Erickson, 2004) as a useful indicator of network diversity. The total number of occupations respondents reported knowing was normally distributed: responses ranged from 0 to 18, with a mean of 9.17 and a standard deviation of 4.59. In order to assess the validity of the indicator, the correlation between number of positions and educational attainment was compared between the sample drawn and other studies. In other studies, the two indicators were moderately correlated with correlations of 0.44 (Van Der Gaag et al., 2004) and 0.48 (Lang & Roessl, 2010). In the sample drawn, number of positions and education were moderately correlated with a correlation of 0.29, once again suggesting a measure of validity.

An indicator of upper reachability was constructed by isolating the highest status score reported. Engineering was the highest status occupation included in the PGR module (Boyd, 2008), with a status score of 94. Upper reachability scores for the study sample ranged from 11 to 94, with those who selected no positions considered missing data. The mean score was quite high (86.59). For high prestige, 6,514 (53.7%)

respondents selected the highest value (94), resulting in a skewness of -3.56 and a kurtosis of 15.67 (see Table 2). To correct for the large negative skew and outliers, the variable was first transformed so that the skew was now positive (3.56). Then a square root transformation corrected for skewness. In order to assess the validity of the indicator, the correlation between high prestige and educational attainment was compared between the sample drawn and other studies. In other studies, the two indicators were moderately correlated with a correlation of 0.43 (Van Der Gaag et al., 2004) and 0.36 (Lang & Roessl, 2010). In the sample drawn, number of positions and education were moderately correlated with a correlation of 0.25, suggesting validity.

Finally, an index of total accessed prestige was constructed by summing the total prestige scores obtained across all of the occupations assessed. Within the study sample, total assessed prestige scores ranged from 0 to 928.5 with a mean of 501.29. In order to deal with multicollinearity (Appendix C), the variable was dropped from the analyses (due to being the highest correlated of the social capital variables and having a lower conceptual emphasis among the social capital indices accessed by Lin et al. (2001)).

After dropping total prestige from the model, zero-order correlations among the three PGR measures of bridging social capital ranged from 0.62 to 0.75 (Appendix A). This suggests that PGR indexes are fairly highly correlated. This is expected given that having a larger range of contacts would more often than not mean knowing more occupations and a higher likelihood of having contacts with higher prestige scores. Consequently, independent analyses were run for each of the three PGR indexes.

In addition to the three indexes developed from the PGR, further indicators of bridging social capital included two measures of civic engagement: (1) number of

organizations participated in; and (2) activity in organizations during the last twelve months. Civic engagement has been employed as an indicator of bridging social capital elsewhere (Beaudoin, 2011; Hampton, 2011; Son et al., 2010). However, whether civic engagement is a form of social capital or its outcome is debated (Hunout & Shea, 2003; Lin et al., 1999). Civic engagement has also been linked to self-reported health in later life (Son, et al., 2010; Wahrendorf, et al., 2010).

Respondents were asked to indicate whether they were a member of or participant in each of the following groups during the last twelve months: (1) a union or professional association, (2) a political party or group, (3) a sports or recreational organization, (4) a cultural, educational or hobby organization, (5) a religious-affiliated group, (6) a school group, neighbourhood, civic or community association, (7) a service club or fraternal organization, and (8) any other type of organization not mentioned. Responses to each were coded as (1) Yes and (2) No. Respondents were then asked "How many of all the groups we talked about were you a member of?" with responses ranging from 0 to 25. To correct for the large positive skew and outliers (skewness of 2.84 and a kurtosis of 21.94), observations were truncated (i.e., responses of 5 or higher recoded into a "5 plus organizations participated in" category). In order to assess the validity of the indicator, the correlation between civic participation in organizations and educational attainment was compared between the sample drawn and another study. In another study the two indicators were weakly correlated with a correlation of 0.19 (Young, 2011). In the sample drawn, civic participation in organizations and educational attainment were moderately correlated with a correlation of 0.25, suggesting some evidence for the validity of the measure.

Respondents who indicated membership or participation in at least one of these groups were also asked how often they participated in group activities and meetings altogether, with responses coded into five categories: (1) at least once a week, (2) a few times a month, (3) once a month, (4) once or twice a year, and (5) not in the past year. For this study, participants who indicated no organizational memberships or participation were coded as (5) 'not in the past year'. Responses were normally distributed (see Table 2). The largest category was 'not in the past year' (42.66%) and the smallest was 'a few times a month' (10.68%). In order to assess the validity of the indicator, the correlation between activity in civic organizations and religious participation was compared between the sample drawn and another study. In another study, the two indicators were moderately correlated with a correlation of 0.23 (Sinha, 2010). In the sample drawn, activity in civic organizations and religious participation were moderately correlated with a correlation of 0.22, suggesting that activity in civic organizations did not have a serious validity problem.

Zero-order correlation between the two civic engagement measures was 0.65. This suggests that the two civic engagement indicators are moderately highly correlated. To adjust for this, a conservative approach was employed by running regressions with the variables entered independently. Correlations between the number of organizations that respondents participated in and the four PGR measures of bridging social capital ranged from 0.22 to 0.39. Correlations between the frequency of participation in organizational activities and the four PGR bridging social capital measures ranged from 0.18 to 0.33. Thus, the two civic engagement indicators were moderately correlated with the four PGR measures, suggesting that there is not a serious multicollinearity issue.

Economic Capital

Economic capital tends to be measured based on income (i.e., individual and/or household). However, disparities in income that are evident in midlife may not be evident in later life when assets other than income become increasingly important. As a result, there is increasing attention within the research literature to the importance of including measures of wealth that reflect the value of accumulated assets such as home and other property, savings, retirement accounts, and investments (Adams, 1981). To attempt to address this issue in the present study, two measures of economic capital were used: household income and dwelling ownership.

Household Income: Household income is considered a more appropriate measure of economic capital than individual income in later life insofar as older adults are more likely to be dependent, retired and/or to never have participated in paid work than those who are younger. In the GSS, respondents were asked: "What is your best estimate of the total income, before deductions, of all household members from all sources during the past 12 months?" Responses were coded into twelve categories ranging from: (1) no income or a loss in income, through (12) $100,000 or more. Household income was subsequently weighted by Statistics Canada to adjust for the number of people in the household using a formula previously developed by Ross (2002). This weighting was maintained for this study. Approximately 21.5% of respondents had incomes below $30,000 per year, 31.1% had incomes between $30,000 and $60,000 per year, and 47.4% had incomes over $60,000 per year. In order to assess the validity of the indicator, the

correlation between household income and educational attainment was compared between the sample drawn and other studies. In a study conducted by Lopez (2004), the two indicators were moderately correlated with a correlation of 0.22. In the sample drawn, household income and educational attainment had a moderate correlation of 0.39, suggesting that household income did not have a serious validity problem.

Over twenty percent of those in the study sample (n=2,505) did not respond to the household income question, and were therefore coded as missing. To attempt to deal with this issue, imputation methods were employed. Imputation is a procedure for adjusting variables with large amounts of missing data. Imputation of missing data on a variable replaces the missing value with a value that is drawn from an estimate of the distribution of the variable. Imputation can be either single or multiple. Single imputation fills in a single missing value for each missing value. However, Rubin's (1987) multiple imputation procedure replaces each missing value with a set of plausible values that represent the uncertainty about the right value to impute; these multiple imputed data sets are then analyzed.

STATA12 supports multivariate imputation using the *mi impute* command. The advantage of using various estimates is that they reflect the uncertainty in the estimation of a distribution (Donders et al., 2006). The standard for multiple-imputations has been 5-10, however, Bodner (2008) advises having as many imputations as the percentage of missing data, as running more imputations is no more work for the analyst. The logic here is that the results tend to be inconsistent if you run the series of multiple imputations more than once. In accordance with Bodner (2008), for this study, twenty imputations were drawn as 20.6% of the data were missing for household income.

Dwelling Ownership: Ideally, to measure wealth, one needs data on a broad range of assets (i.e., one's home, other real estate, business assets, savings and investments), as well as debts. Such data are not available within the GSS. However, the home tends to be people's single major asset. Therefore, given its availability in the dataset, home ownership was used as an indicator of assets that may be exchanged for income. Participants were asked whether or not they or another member of their household owned their dwelling. The response categories were: (1) Yes or (2) No. The vast majority of respondents reported owning a home (83.14%).

Zero-order correlation between the two economic capital measures was 0.37, suggesting that a moderate correlation exists, but not a high enough correlation to suggest that the two variables are measuring the same component of economic capital.

Dependent Variables

The dependent variable used in this study was health status. Several health indicators may be employed to capture health status, including, but not limited to, indicators of mortality and morbidity, symptomatology, pain evaluations, cognitive tests, physical disability, functional health, activities of daily living (ADL's) and instrumental activities of daily living (IADL's), psychological well-being, depression, self-reported or self-assessed or self-perceived health[ix], general well-being, and quality of life. Here, three indicators are employed to capture health status: chronic conditions, health or activity limitations and self-reported health. This is based on previous literature indicating the particular importance of chronic conditions and activity limitations in the later years of

the life course as well as the need to go beyond biomedically-defined definitions of health and incorporate broader social definitions of health.

In the past, health scales mostly committed to a 'biomedical model' which implied a definition of health as the absence of disease (Bowling, 1997)[x]. However, research has suggested that disease model scales are limited in terms of legitimacy (Popay et al.1998), reliability (Bradwell et al., 1974; Grasbeck & Saris 1969; Hall et al. 1976; Heasman & Lipsworth, 1966; Jachuck et al. 1982; Orth-gomer, et al. 1979; Thomas & Lyttle, 1980), and contextually (Bowling, 1997; McDowell & Newell, 1996). More recently, an alternative to the biomedical model, known as the social model of health has been developed. The World Health Organization definition of health is often provided as an example of the social model of health: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (n.d.). From the standpoint of the social model of health, the health of individuals is understood to be the result of complex and interacting social, economic, geographic and biographical factors, and commonly assesses an individual's self-rated health on a four or five item Likert scale (Bowling, 1997) .

Hunt and McEwen (1980) have suggested that the social model of health redresses a balance between lay and professional knowledge, and may teach us something about why individuals get sick at all as opposed to what causes specific diseases. Therefore, researchers (Bolin, 1997; Bosworth et al., 2009; Hunt & McEwen, 1980) suggest employing a "complementary" model which attempts to supplement the limitations of using one health status scale with the employment of several health status measures. To accompany these suggestions, this study employed three indicators of

health status including chronic conditions, health or activity limitations and self-reported health.

Chronic Conditions: To measure chronic conditions, this study used a count variable which summed the number of chronic conditions reported by a respondent. This variable was derived from questions assessing whether or not respondents reported having any of the following 23 conditions: asthma, arthritis, back problems, high blood pressure, headaches, heart disease, mood disorder-depression, diabetes, anxiety disorder, bowel disorder, urinary incontinence, intestinal or stomach ulcers, chronic bronchitis, cancer, effects of a stroke, emphysema, chronic obstructive pulmonary disease, Alzheimer's disease, cholesterol, thyroid, allergy, fibromyalgia, and osteoporosis. In the sample drawn here, the total number of chronic conditions reported ranged from 0 to 11, with a mean of 1.42 (see Table 1). The variable was normally distributed with minimal skewness (see Table 2).

Health or Activity Limitation: To measure health or activity limitations, this study employed a derived variable. The variable measured whether or not the respondent reported being limited in the amount or kind of activity they can do at home, at work, at school or in other activities because of a physical condition, mental condition or health problem. The response categories were: (1) Yes or (2) No. Less than half of the study sample (46.05%) reported having health or activity limitations (Table 1).

Self-Reported Health:

Self-reported health (SRH) is one of the most frequently used indicators of health in current research (Smith & Goldman, 2011). This research suggests that SRH is a broad and independent measure of health status, which captures aspects of physical and mental health, as well as unexplained aspects of well-being (Fylkesnes & Forde, 1992; Lawrence, 1995).

To measure self-reported health status, this study relied on responses to the question: "In general, would you say your health is: (1) excellent, (2) very good, (3) good, (4) fair or (5) poor?" Most respondents (79.80%) reported good, very good or excellent health (see Table 1). However, skewness levels were acceptable (see Table 2). In order to assess the validity of the indicator, the correlation between self-reported health and educational attainment was compared between the sample drawn and another study. In another study, the two indicators were weakly correlated with a correlation of -0.14 (Subramanian, et al., 2009). In the sample drawn, self-reported health and educational attainment were weakly correlated with a correlation of -0.21, suggesting that self-reported health did not have a serious validity problem.

Zero-order correlations between the three health status measures ranged from -0.47 to 0.43. As expected, the number of chronic conditions and whether an individual has an activity limitation or not had a moderate and positive correlation (r=0.44). As well, self-reported health had moderate and negative correlations with number of chronic conditions and health or activity limitation.

Control Variables

The following variables were expected to influence the age-economic/social capital-health relationship and were therefore included in the analyses as control variables: gender, educational attainment, aboriginal status, visible minority status, immigrant status, rural or urban residence, province of residence, religious group participation, and employment status.

Gender: The relationship between economic capital and health across the life course is gendered (Mishra et al., 2004). In addition, women report having larger and more multifaceted networks than men (Antonucci & Akiyama, 1987; Maguire, & Pitceathly, 1995), which are more likely to be kin-based (Fischer & Oliker, 1983). Also, women's social capital is particularly vulnerable to changes in socioeconomic status (Ajrouch et al., 2005). To ensure that gender differences were taken into account in the analyses, a dichotomous variable with response categories: (1) male and (2) female was used. Overall, 48% of those in the study sample were male and 52% were female.

Education: Educational attainment has been conceptualized elsewhere as a form of cultural capital (Bourdieu, 1986), human capital (Frytak et al. 2003), and is an important component of SES. Educational attainment was expected to be an important control variable in this study. It has been suggested elsewhere (Baum, 2003) that along with age, education may be a causal variable influencing social capital. Social capital has also been found to impact health status through human capital (the combination of formal education and additional training), and through human capital's impact on economic capital (Frytak

et al., 2003). As well, human capital has been found to independently mediate the age-health status relationship (Frytak et al., 2003). To control for education, a continuous variable was used which measures the highest level of education obtained by the respondent on a 10-point scale. The response categories were: (1) Doctorate/masters/some graduate, (2) bachelor's degree, (3) diploma/certificate from community college, (4) diploma/certificate from trade/technical, (5) some university, (6) some community college/CEGEP/nursing, (7) some trade/technical, (8) high school diploma, (9) some secondary/high school, and (10) elementary school/no schooling. The majority of those in the study sample (63%) had an education level above the completion of high school.

Aboriginal Status: Aboriginal status is likely to influence economic and social capital as well as health status. For instance, at the individual-level, income disparities between Aboriginals as a whole, and the remaining Canadian population were large between the 1995 and 2005 period, with a 10%-20% differential between Aboriginal and non-aboriginal women, and a 20%-50% between Aboriginal and non-aboriginal men (Pendakur & Pendakur, 2011). In fact, the health of aboriginal peoples in Canada (including First Nations, Inuit and Métis) is known to be poorer than that of the overall Canadian population on virtually every health status measure (CIHI, 2004). The GSS asked the respondent: "Are you an Aboriginal person, that is, North American Indian, Métis or Inuit?" Responses were coded as: (1) Yes and (2) No. Overall, 2.6% of those included in the study sample identified as Aboriginal.

Visible Minority Status: In Canada, health status differences among racial and ethnic groups other than Aboriginal people appear less prevalent than in the U.S. (McMullin, 2004). However, this has been noted as possibly attributable to the lack of research more than lack of real differences (Chappell & Penning, 2009). For example, in Canada, visible minority status has been found to be associated with chronic conditions (McDonald & Kennedy, 2004) and mental health (Wu et al., 2003). To assess visible minority status, Statistics Canada adopted the *Employment Equity Act* definition (of visible minority status as applying to those who identified themselves as being non-Caucasian in race or non-white in colour - Statistics Canada, 2008). The derived variable was constructed by asking respondents: "People in Canada come from many racial or cultural groups. You may belong to more than one group on the following list. Are you: White, Chinese, South Asian, Black, Filipino, Latin American, Southeast Asian, Arab, West Asian, Korean, Japanese, Caucasian, Greek, Italian, Portuguese, European, Eurasian, Taiwanese, Fijan, Guyanese, Haitian, Jamaican, Trinidadian/Tobagonian, West Indian, and Other-Specify?" To control for visible minority status, this study used a derived variable with two response categories: (1) visible minority and (2) non-visible minority. Overall, 8.9% of those in the study sample identified themselves as members of a visible minority group.

Immigrant Status: Immigrant status is important to control for given consistent support for a healthy immigrant effect (HIE).[xi] The HIE is the name for the process in which the health status of recent immigrants to Canada is generally found to be higher upon immigration than that of the Canadian-born population, but then declines to the

equivalent of Canadian-born population in succeeding years. To measure immigrant status, respondents were asked two questions: "Are you now, or have you ever been, a landed immigrant in Canada?" and "In what year did you get your landed immigrant status?" From these two questions, two dummy variables were developed: (1) immigrant of less than ten years versus non-immigrant or longer-term immigrants as the reference group; and (2) immigrant of ten or more years versus non-immigrant or shorter-term immigrants as the reference group. Ten years since immigration is used as the cut-off as research (Gee et al., 2003, Chui, et al., 2009) has shown ten years to be the point at which the health of recent immigrants, as a group, tends to reach the level of the rest of the Canadian population. Overall, 21% of those in the study sample were immigrants: 5% were immigrants who had been in Canada for less than ten years while 95% had been in Canada for ten or more years.

Rural/Urban Residence: In Canada, the average life expectancies and self-reported health status of rural residents tend to be lower than urban residents, while accident and disability rates, mortality due to injury, and the prevalence of some chronic diseases tends to be higher than those living in urban areas (Chappell & Penning, 2009). To measure rural/urban residence, a derived variable was used which draws on postal code information to classify areas of residence into the categories: (1) Larger Urban Centres (CMA/CA), and (2) Rural and Small Town (non-CMA/CA)[xii]. Overall, 78% of those in the study sample were classified as urban while 22% were considered rural and small town residents.

Province of Residence: As population health and health care are provincial responsibilities in Canada, provinces and territories often differ with respect to the health status of their populations (Chappell & Penning, 2009). For example, only 17 percent of Saskatchewan residents rate their health as excellent compared to 27 percent of those living in Quebec (Health Canada, 1999). To measure province of residence, a derived variable was used, which categorized respondents by province of residence: (1) Newfoundland and Labrador, (2) Prince Edward Island, (3) Nova Scotia, (4) New Brunswick, (5) Quebec, (6) Ontario, (7) Manitoba, (8) Saskatchewan, (9) Alberta, (10) British Columbia. Reflecting the distribution of the Canadian population, 63% of the respondents resided in either Quebec or Ontario while 14% lived in British Columbia.

Religious Group Participation: Participation in religious organizations is an important type of civic participation which has been found to have an independent impact on both physical health (Aaron et al., 2003) and mental health (Chen et al., 2007). To measure religious participation, participants were asked: "Other than on special occasions, (such as weddings, funerals or baptisms), how often did you attend religious services or meetings in the last 12 months?" The response categories were: (1) Not at all, (2) At least once a year, (3) A few times a year, (4) At least once a month, and (5) At least once a week. Overall, 62% of those in the study sample attended religious services at least once a year.

Employment Status: Labour force participation has been found to have a positive impact on physical and self-reported health status in Canada (Kosteniuk & Dickinson, 2003).

Respondents were asked: “Did you have a job or were you self-employed at any time during the past 12 months?” and “Were you mainly: (1) … a paid worker?, (2) … self-employed?, (3) … an unpaid family worker?” An initial recode was developed with groups: (1) unemployed, (2) employed–wage labour, and (3) self-employed. The unemployed group included individuals looking for paid work, going to school, caring for children, household work, retirees, maternity/paternity leave, long term illness, and volunteering or care-giving other than for children. From these, two dummy variables were created: (1) employed in wage labour versus not employed in wage labour as the reference group; and (2) self-employed versus not self-employed as the reference group. Over forty percent (42%) of those in the study sample were employed in wage labour and 13% were self-employed. The remainder were not employed.

Methods of Data Analysis

This study conducted multivariate regression analyses to assess how economic and social capital variables relate to one another to impact health status in middle and later life. Multiple regression models provide information that cannot be obtained using simple models that only accommodate two variables at a time. For this study, multiple regression procedures were useful given the number of independent variables in each model. The ability to describe partial relationships between variables is important given this study’s research questions focus on the relationship between several independent variables (age, economic and social capital) and dependent variables (number of chronic conditions, health or activity limitations and self-reported health).

The study used three different types of dependent variables (count, dichotomous, and ordinal) to measure health status. For analyses of number of chronic conditions (a count variable), poisson regression was used; for health or activity limitations (a dichotomous variable), logistic regression was employed; and for self-reported health (an ordinal variable), an ordered logit model was used. Each model has its own series of assumptions. For example, Poisson regression has three assumptions: (1) that the dependent variable follows a Poisson or negative binomial process; (2) that a negative binomial process results from a mixture of Poisson processes, such as sampling from multiple Poisson processes with varying means, such that the resulting distribution (negative binomial) is said to be an over dispersed Poisson distribution; and (3) that data can be censored or truncated (but it is not an essential characteristic of the process) (Christensen, 1990). Finally, logistic regression assumes independence and linearity in the logit while ordered logit assumes that the data meet the proportional odds assumption that the relationship between any two pairs of outcomes is statistically the same.

To test the independence assumption, multicollinearity was assessed. When two or more variables in a model are highly correlated, one has the possibility of a multicollinearity problem. This has consequences as analyses may be weakened by using redundant variables in a model. The implication of this situation is that the estimates of the coefficients (b's) will be unstable which makes it difficult to distinguish significant from non-significant independent variables (Singleton et al., 1993). To assess multicollinearity, an initial assessment of a correlation matrix was completed to assess whether there are relatively strong correlations between the independent variables (see Appendix A). The strongest correlations were evident between range of prestige and

highest prestige (.76), total prestige (.71), and number of positions assessed (.73). Total prestige and highest prestige were also highly correlated (.60) and the highest correlation was between number of positions and total prestige (.97). Thus, all PGR variables were highly correlated with one another.

Given these relatively strong correlations, in addition to assessing the correlation matrix, collinearity diagnostics were performed (see Figure 3.1). The collinearity statistics examined were the tolerance levels and variance inflation factor (VIF) for each major variable. According to Menard (1995), tolerance levels of less than .10 and VIF values of greater than 10 are indicative of potentially serious multicollinearity problems. A tolerance value near one indicates independence while a value near zero indicates that the variable is essentially a linear combination of other independent variables in the model. Most of the measures were quite independent, with a tolerance of .60-.93 and a VIF of 1.07-1.65. However, highest prestige (.357), total assessed prestige (.053), number of positions assessed (.051), and range of prestige (.026) all had very low tolerance levels and VIF ranging from 2.80-19.46. The two highest VIFs were total prestige (18.86) and number of assessed positions (19.46). Furthermore, the correlation matrix suggested that total prestige and number of positions assessed were very highly correlated (r=.97). In consideration of these results, and the fact that total prestige is the least frequently used index in position generator based studies, total prestige was dropped from further analysis (Lin, 2001). A corrected correlation matrix (see Figure 2.2) and further collinearity diagnostics were assessed (see Figure 3.2). The corrected model's VIF values ranged from 1.17-3.49, with a tolerance range of 0.28-0.86, suggesting that there are no other major problems with multicollinearity.

To test the linearity assumption, tests may be conducted using scatterplots by assessing (1) each independent variable's dispersion, (2) residuals against the predicted values and (3) the residuals against the values of the independent variables. If the residuals do not fall in some sort of horizontal band, concerns may be raised as to whether or not they fall into some type of pattern (Norusis, 1993). In this study, linearity tests were conducted using scatterplots of the residuals against the values of the independent variables (Appendix F). Linear regressions were run to assess initial residual scatterplots for each major independent variable against each of the three dependent variables. Assessment of the scatterplots indicated that over half of the independent variables conformed to a horizontal band. However, number of close contacts, high prestige, total assessed prestige[xiii], range of prestige, and civic participation in organizations were identified as potentially deviating from linearity in accordance with the scatterplot results (see Appendix F).

Poisson distribution and negative binomial distribution are forms of regression analysis used to model count data and contingency tables. If the count variable's variance is higher than its mean, then negative binomial regression is a better fit than a Poisson model. The dependent count variable used in this study is number of chronic conditions. The mean number of chronic conditions reported by those in the study sample was 1.42 with a variance of 1.88. As the observed variance is greater than the mean, a negative binomial distribution was employed rather than a Poisson distribution. What the negative binomial distribution offers is one more parameter than the Poisson distribution. This meant that that the second parameter was used to adjust the variance independently of the mean.

Logistic regression is used for prediction of the probability of occurrence of an event by fitting data to a logistic function. Assumptions of logistic regression are that: (1) explanatory variables should not be highly correlated with one another because this could cause problems with estimation; (2) large sample sizes are required for logistic regression to provide sufficient numbers in both categories of the response variable; and (3) the more explanatory variables, the larger the sample size required (Bewick, et al. 2005). Logistic regression was used for the health and activity limitations models. Due to the large sample size (n=12,135) and the withdrawal of the highest correlated variable, logistic regression procedures should not have been violated.

Lastly, ordered logistic regression is a regression model that allows for more than two ordered response categories. For self-reported health, an ordered logit model was employed as it is the most appropriate model for ordinal dependent variables. The main assumption underlying ordered logistic regression is that the relationship between each pair of outcome groups is the same. This is called the proportional odds assumption or the parallel regression assumption (UCLA: Academic Technology Services, n.d.). To test this assumption, a likelihood ratio test was conducted using probit models. These tests are used to see if there is a difference in coefficients between models; a non-significant result suggests no difference. According to the *omodel command* and Brant test, the Prob>chi2 is 0.00, suggesting that the ordered logistic model is not an appropriate fit for self-reported health status as the model's parallel lines assumption is violated. Williams (2005) suggests that there are four ways to deal with the results of a Brant test: (1) ignore it (a fairly common practice), (2) go with a non-ordinal alternative, such as mlogit, (3) go with an ordinal alternative, such as gologit or gologit2, (4) try an in-between approach

known as partial proportional odds. An alternative generalized logit model (Williams, n.d.) was employed. Results suggest that the generalized logit model's assumptions were also violated with a Prob >chi2 = 0.00. However, although the Brant test on the ordered logistic regression model and generalized logit model showed that the parallel regression assumption was violated, these models are still considered a more appropriate fit than others (e.g. OLS). Considering that alternative models also violate the assumption, according to the Brant test, the decision was made to "ignore it".

In preparation for regression analysis, an age group filter and adjusted bootstraps were employed so that bootstrapped standard errors and test statistics were reported for the 45+ age group. Bootstrapping is a method of resampling (with replacement), many times from the observed data, thereby allowing the performance of statistical methods to be checked by applying them to a large number of samples. In this study, a filter was employed for all models which included only 45+ age groups, and a check completed to ensure that the sample size was correct (n=12,135). To gain more precise estimates of the sampling variability of estimates, bootstrapping methods were employed through STATA12 on all models. This allowed the researcher to make use of complex survey design information and calculate more reliable variance estimates. To adjust for sampling weight and BRR weights, the 'Svyset' command was employed through STATA12 as outlined by Keown and Roberts (2009). Then, a regression test was run to check if bootstrapping was employed correctly. In accordance with the checking method suggested by Keown and Roberts (2009), the estimate remained the same (3.59) and the variance changed (from .029 to .008), indicating that bootstraps were employed

successfully. Twenty multiple imputations were then created using the *mi impute* command for the household income variable.

For each dependent variable, the analyses began by addressing the impact of various control variables on the dependent variable (Model 1). Next, the impact of age was addressed by adding this variable to the regression model (Model 2); both linear and curvilinear (quadratic) associations were assessed. Models 3 to 5 introduced: social capital (Model 3), economic capital (Model 4), and both economic and social capital (Model 5) to determine main and mediation effects. Subsequent models introduced interactions between social and economic capital into the analyses.

Chapter 4: Findings

This chapter reports the results of analyses conducted to assess whether and how economic and social capital relate to impact health status in middle and later life. Table 3 reports the findings obtained for chronic conditions as the dependent variable, Table 4 reports findings for health or activity limitations, and Table 5 reports the findings for self-reported health. For each dependent variable, findings are reported in sequence based on their order of entry into the model: controls (model 1), age (model 2), economic capital (model 3), social capital (model 4), economic and social capital together (model 5), and finally, various interactions involving economic and social capital (models 6-12). This permits assessment of: 1) the main effects of both economic and social capital on health; 2) their mediating effects; and 3) their moderating effects. Predicted probabilities (see Appendix D) are discussed only for statistically significant relationships (notated * if $p<.05$, ** if at a $p<.01$ level, and *** if at a $p<.001$ level).

All models presented were replicated through five methods including: 1) non-multiple imputed data with no weights; 2) non-multiple imputed data with adjusted weights; 3) non-multiple imputed data using bootstrapped estimates; 4) multiple imputed data with no weights; and 5) multiple imputed data using adjusted weights. A decision was made to report the results of the non-multiple imputed data using bootstrapped variance estimates (method #3). Deviations in the same models across any of the five methods are noted with an asterisk under the respective table. Deviations across methods were defined as a shift from significance to non-significance or vice-versa (using $p<.05$ as a standard).

Chronic Conditions

Table 3 (models 1-12) presents the findings obtained for analyses on number of chronic conditions. The table reports incident ratio-rates, their standard errors, and significance levels. Significance tests for coefficients are against H0: exp(b) = 1.0. The presentation of results proceeds from a discussion of IRRs to an interpretation of predicted probabilities for statistically significant relationships involving the main study variables.

Table 3: Chronic Conditions Models

Chronic Conditions	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	1.169 (0.025)***	1.179 (0.025)***	1.157 (0.027)***	1.157 (0.026)***	1.139 (0.028)***
Education	0.971 (0.003)***	0.973 (0.003)***	0.982 (0.003)***	0.969 (0.003)***	0.977 (0.004)***
Aboriginal Status	1.277 (0.076)***	1.325 (0.080)***	1.265 (0.081)***	1.345 (0.082)***	1.281 (0.083)***
Visible Minority Status	0.959 (0.052)	0.991 (0.054)	0.970 (0.067)	1.058 (0.060)	1.042 (0.073)
Immigrant1	0.666 (0.104)*	0.709 (0.111)*	0.682 (0.114)*	0.743 (0.125)	0.684 (0.128)*
Immigrant2	1.019 (0.029)	0.997 (0.028)	0.987 (0.032)	1.006 (0.030)	1.002 (0.033)
Rural/Urban	0.973 (0.022)	0.974 (0.022)	0.998 (0.025)	0.975 (0.022)	0.987 (0.025)
Province					
Prince Edward Island	0.963 (0.065)	0.953 (0.063)	1.022 (0.073)	0.928 (0.064)	0.984 (0.073)
Nova Scotia	1.134 (0.059)*	1.125 (0.059)*	1.149 (0.073)*	1.122 (0.061)*	1.147 (0.074)*
Newbrunswick	1.121 (0.054)*	1.116 (0.054)*	1.164 (0.066)**	1.100 (0.056)	1.142 (0.068)*
Quebec	0.884 (0.036)**	0.876 (0.036)**	0.910 (0.043)**	0.870 (0.037)**	0.907 (0.045)*
Ontario	1.039 (0.041)	1.027 (0.040)	1.107 (0.049)*	1.020 (0.042)	1.095 (0.051)
Manitoba	0.954 (0.049)	0.943 (0.048)	0.947 (0.056)	0.941 (0.049)	0.939 (0.058)
Saskatchewan	1.078 (0.059)	1.062 (0.059)	1.149 (0.071)	1.064 (0.062)	1.142 (0.075)*
Alberta	1.008 (0.050)	1.002 (0.050)	1.092 (0.063)	0.994 (0.052)	1.076 (0.064)
British Columbia	0.931 (0.041)	0.918 (0.041)	0.978 (0.050)	0.909 (0.042)*	0.957 (0.051)
Wage Labour	0.632 (0.015)***	0.709 (0.021)***	0.745 (0.024)***	0.702 (0.021)***	0.736 (0.024)***
Self-Employment	0.640 (0.022)***	0.695 (0.026)***	0.726 (0.029)***	0.681 (0.026)***	0.705 (0.029)***
Religious Attandence	1.005 (0.006)	0.999 (0.006)	1.003 (0.007)	0.997 (0.007)	0.999 (0.007)
Linear Age		1.401 (0.073)***	1.149 (0.025)***	1.152 (0.023)***	1.151 (0.025)***
Age-Squared		0.986 (0.002)***	0.999 (0.000)***	0.999 (0.000)***	0.999 (0.000)***
Household Income			0.967 (0.000)***		0.966 (0.005)***
Dwelling			0.884 (0.000)***		0.891 (0.025)***
Close Contacts				0.994 (0.001)***	0.996 (0.001)**
Frequency of Contact				1.022 (0.013)	1.019 (0.014)
Number of Positions Assessed				1.007 (0.005)	1.010 (0.005)*
Range of Prestige				0.988 (0.006)	0.992 (0.008)
High Prestige				1.028 (0.013)	1.021 (0.015)
Civic Participation: Count				1.011 (0.010)	1.016 (0.012)
Civic Participation: Activity				0.993 (0.009)	0.990 (0.009)
N	11684	11691	9381	10938	8915
Constant	1.951 (0.090)***	2.577 (0.240)***	1.887 (0.143)***	1.382 (0.129)**	1.794 (0.201)***
* P<.05; ** P<.01; *** P<.001.					
Coefficients reported are incidence rate ratios.					
Bootstrapped standard errors are reported in parentheses.					
Model 4: range of prestige was significant in non-mi no weight and weighted models, as well as for MI no weights.					
Model 4: frequency of contact was non-significant in non-mi weighted and MI non-weighted and weighted models.					

Table 3: Chronic Conditions Models Continued

Chronic Conditions	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Gender	1.141 (0.028)***	1.141 (0.028)***	1.142 (0.028)***	1.139 (0.028)***	1.140 (0.028)***	1.141 (0.028)***	1.137 (0.028)***
Education	0.978 (0.004)***	0.978 (0.004)***	0.978 (0.004)***	0.976 (0.004)***	0.976 (0.004)***	0.978 (0.004)***	0.978 (0.004)***
Aboriginal Status	1.286 (0.082)***	1.280 (0.081)***	1.280 (0.081)***	1.279 (0.083)***	1.277 (0.083)***	1.281 (0.081)***	1.275 (0.081)***
Visible Minority Status	1.024 (0.071)	1.025 (0.072)	1.024 (0.072)	1.039 (0.073)	1.039 (0.073)	1.024 (0.071)	1.019 (0.071)
Immigrant1	0.676 (0.124)*	0.673 (0.124)*	0.673 (0.124)*	0.687 (0.127)*	0.687 (0.127)*	0.673 (0.124)*	0.667 (0.122)*
Immigrant2	0.099 (0.033)	0.988 (0.033)	0.988 (0.033)	1.000 (0.033)	0.999 (0.033)	0.989 (0.033)	0.991 (0.033)
Rural/Urban	0.993 (0.025)	0.991 (0.025)	0.991 (0.025)	0.989 (0.025)	0.989 (0.025)	0.991 (0.025)	0.997 (0.025)
Province							
Prince Edward Island	1.013 (0.076)	1.013 (0.076)	1.015 (0.076)	0.984 (0.073)	0.982 (0.073)	1.014 (0.076)	1.018 (0.075)
Nova Scotia	1.143 (0.074)*	1.142 (0.074)*	1.144 (0.074)*	1.147 (0.074)*	1.146 (0.074)*	1.141 (0.074)*	1.144 (0.074)*
Newbrunswick	1.158 (0.068)*	1.156 (0.068)*	1.156 (0.068)*	1.115 (0.067)*	1.141 (0.068)*	1.155 (0.068)*	1.152 (0.068)*
Quebec	0.901 (0.044)*	0.901 (0.044)*	0.903 (0.044)*	0.907 (0.044)*	0.906 (0.044)*	0.901 (0.044)*	0.903 (0.044)*
Ontario	1.105 (0.051)*	1.104 (0.051)*	1.105 (0.051)	1.095 (0.051)	1.094 (0.051)	1.104 (0.051)*	1.104 (0.051)*
Manitoba	0.956 (0.058)	0.960 (0.058)	0.960 (0.057)	0.938 (0.058)	0.937 (0.057)	0.957 (0.058)	0.952 (0.058)
Saskatchewan	1.152 (0.075)*	1.152 (0.075)*	1.105 (0.058)*	1.145 (0.075)*	1.144 (0.075)*	1.151 (0.075)*	1.156 (0.075)*
Alberta	1.078 (0.064)	1.076 (0.064)	1.078 (0.051)	1.074 (0.064)	1.073 (0.064)	1.075 (0.063)	1.075 (0.063)
British Columbia	0.966 (0.051)	0.967 (0.505)	0.968 (0.051)	0.957 (0.051)	0.956 (0.051)	0.966 (0.051)	0.967 (0.051)
Wage Labour	0.743 (0.024)***	0.742 (0.024)***	0.742 (0.024)***	0.735 (0.023)***	0.735 (0.024)***	0.742 (0.024)***	0.744 (0.024)***
Self-Employment	0.711 (0.029)***	0.712 (0.029)***	0.712 (0.029)***	0.704 (0.029)***	0.705 (0.029)***	0.712 (0.029)***	0.715 (0.029)***
Religious Attandence	1.003 (0.007)	1.003 (0.007)	1.003 (0.007)	0.998 (0.007)	0.998 (0.007)	1.003 (0.007)	1.000 (0.007)
Linear Age	1.428 (0.085)***	1.428 (0.085)***	1.431 (0.084)***	1.411 (0.084)***	1.404 (0.084)***	1.428 (0.085)***	1.419 (0.084)***
Age-Squared	0.986 (0.002)***	0.986 (0.002)***	0.986 (0.002)***	0.987 (0.002)***	0.987 (0.002)***	0.986 (0.002)***	0.986 (0.002)***
Household Income	0.966 (0.005)***	0.966 (0.005)***	0.966 (0.005)***	0.965 (0.005)***	0.965 (0.005)***	0.966 (0.005)***	0.964 (0.005)***
Dwelling	0.896 (0.025)***	0.887 (0.025)***	0.885 (0.024)***	0.885 (0.025)***	0.884 (0.025)***	0.889 (0.025)***	0.899 (0.025)***
Close Contacts	0.996 (0.001)**	0.996 (0.001)*	0.996 (0.001)*	0.996 (0.001)**	0.996 (0.001)**	0.996 (0.001)*	0.997 (0.001)*
Frequency of Contact	1.023 (0.014)	1.023 (0.014)	1.022 (0.104)	1.018 (0.014)	1.018 (0.014)	1.022 (0.014)	1.024 (0.014)
Number of Positions Assessed				1.009 (0.003)**	1.009 (0.003)**		
Range of Prestige	0.988 (0.004)**	0.988 (0.004)**	0.988 (0.004)**			0.988 (0.004)**	
High Prestige							0.991 (0.100)
Civic Participation: Count				1.011 (0.009)	1.010 (0.009)		1.014 (0.009)
Civic Participation: Activity	0.999 (0.008)	0.999 (0.008)	0.999 (0.007)			0.999 (0.007)	
Dwelling#Close Contacts	1.006 (0.003)						
Household Income#Close Contacts	0.999 (0.000)						
Dwelling#Frequency of Contact		0.961 (0.028)					
Household Income#Frequency of Contact		1.000 (0.005)					
Dwelling#Civic Participation Activity			0.983 (0.016)				
Household Income#Civic Participation Activity			1.002 (0.003)				
Dwelling#Civic Participation Count				0.984 (0.018)			
Household Income#Civic Participation Count				0.999 (0.003)			
Dwelling#Number of Positions					0.997 (0.006)		
Household Income# Number of Positions					0.999 (0.001)		
Dwelling#Range						0.996 (0.008)	
Household Income#Range						1.000 (0.001)	
Dwelling#High Prestige							0.977 (0.018)
Household Income#High Prestige							1.003 (0.003)
N	9034	9034	9034	8928	8928	9034	9047
Constant	0.292 (0.102)***	0.297 (0.104)**	0.292 (0.102)***	0.285 (0.098)***	0.295 (0.103)**	0.296 (0.103)**	0.298 (0.103)**
* P<.05; ** P<.01; *** P<.001.							
Coefficients reported are incidence rate ratios.							
Bootstrapped standard errors are reported in parentheses.							

Model 1 assessed the impact of the various control variables on the number of chronic conditions reported by respondents. Significant controls included employment status (wage-labour and self-employment), educational attainment, aboriginal status, gender, immigrant status, and province of residence. In general, those who were employed, both as wage labourers and through self-employment had fewer chronic conditions than those who were not similarly employed. Similarly, those with higher levels of education had fewer chronic conditions as did recent immigrants and residents of Quebec. In contrast, Aboriginal adults, women, and residents of Nova Scotia and New Brunswick had more chronic conditions when compared to others.

Model 2 assessed the age and chronic conditions relationship. The results revealed a significant curvilinear relationship. The incidence rate shows that the change in chronic conditions was an increase of 40% (1.401-1) for every successive age group. For instance, on average, the 45-49 age group had 0.95 chronic conditions, while the 80 years and older age group had 2.54 chronic conditions. However, the quadratic effect shows that this increase accelerated by 0.02 (1-0.986) in every successive age group. To elaborate, the difference between the 0.95 chronic conditions reported by the 45-49 age group and the 1.09 reported by the 50-54 age group was 0.14, whereas the difference between the 50-54 age group and the 55-59 age group was 0.16.

Models 3 and 4 assessed the main effects of the economic and social capital variables on number of chronic conditions. Model 3 assessed the economic capital and number of chronic conditions relationship through the inclusion of household income and dwelling ownership in the model. The findings reveal that both income and dwelling ownership were significantly related to health status as those with higher incomes

reported fewer chronic conditions as did those who reported owning their own dwellings. The incident ratio rate shows a decrease of 3% (1-0.967) in the incident rate of chronic conditions for every unit increase in household income. For instance, for the no income or loss of income group, the predicted number of chronic conditions was 1.80, while the predicted number of chronic conditions was 1.75 for the $5,000 or less income group (1.749/1.807=0.967). As a further example, while holding all other variables at their means, on average an individual in the lowest income group was expected to have 0.55 (1.807-1.259) more chronic conditions than the $100,000 or more income group. Similarly, the average number of chronic conditions was 1.55 for non-dwelling owners compared to 1.37 for dwelling owners (1.372/1.551=0.884). Hence, non-dwelling owners had an incidence rate of chronic conditions 0.18 higher than dwelling owners. Similarly, the incident rate of chronic conditions was 0.88 times the incident rate for non-dwelling owners. Hence, holding all other variables at their means; on average an individual who did not own a dwelling is expected to have 0.14 (1.551-1.372=0.138) more chronic conditions than an individual who owned a dwelling.

Model 4 assessed the social capital and incidence of chronic conditions relationship. Of the seven social capital indicators assessed here, number of close contacts was found to be the only statistically significant predictor of chronic conditions. Those with more social contacts reported fewer chronic conditions. The incident ratio rate shows that for every unit increase in the number of close contacts there is a decrease of 0.6% (1-0.994) in the number of chronic conditions. For an individual with one close contact, the predicted number of chronic conditions was 1.53, while the predicted number of chronic conditions was 1.31 for an individual reporting thirty close contacts. Hence,

while holding all other variables at their means; on average, an individual with one close contact was expected to have 0.22 more chronic conditions than an individual with thirty close contacts.

Model 5 included both economic and social capital variables in the same equation. To assess mediation effects, the coefficients reported in model 5 were compared to those evident in models 3 and 4. Interestingly, there was little evidence of decline in the impact of income or dwelling ownership variables (economic capital) on chronic conditions following the inclusion of social capital measures in the analyses. Thus, there was no evidence to suggest that social capital served to mediate the economic capital and chronic conditions relationship. Nor was there evidence to indicate that the inclusion of economic capital variables in the equation reduced the impact of social capital variables on chronic conditions. Instead, some minor evidence was found to suggest that economic capital measures served to suppress the effects of social capital on chronic conditions. Specifically, with the introduction of economic capital measures into the equation, the impact of the number of positions assessed (a measure of bridging social capital) shifted from not significant to significant at $P<.05$. However, as the change in the IRR was only .003 (from 1.007 to 1.010), the suppression effect was very negligible. Other things being equal, those who knew people in a greater number of occupational positions reported more chronic conditions.

To assess moderation effects, models 6-12 assessed whether economic and social capital interacted to explain incidence of chronic conditions. Each model included two interactions: between household income and a social capital indicator and dwelling

ownership and a social capital indicator. No significant interaction effects were found between any of the economic and social capital indicators assessed.

Health or Activity Limitations

Table 4 (models 1-12) presents the findings for health or activity limitations. These models are based on logistic regression analysis and therefore report odds ratios (as well as standard errors and significance levels) and proceed to an examination of predicted probabilities for statistically significant relationships. Significance tests for coefficients are against H0: exp(b) = 1.0.

Table 4: Health and Activity Limitations Models

Health and Activity Limitations	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	0.992 (0.047)	1.001 (0.048)	0.949 (0.050)	0.982 (0.048)	0.943 (0.052)
Education	0.945 (0.007)***	0.953 (0.008)***	0.972 (0.009)***	0.944 (0.008)***	0.961 (0.009)***
Aboriginal Status	1.552 (0.206)***	1.678 (0.227)***	1.366 (0.194)*	1.729 (0.246)***	1.399 (0.209)*
Visible Minority Status	0.706 (0.082)**	0.766 (0.090)*	0.696 (0.095)**	0.805 (0.102)	0.729 (0.027)*
Immigrant 1	0.539 (0.155)*	0.545 (0.156)*	0.567 (0.174)	0.565 (0.179)	0.622 (0.209)
Immigrant 2	1.045 (0.076)	0.991 (0.073)	1.023 (0.083)	1.016 (0.078)	1.056 (0.088)
Rural/Urban	0.948 (0.052)	0.963 (0.053)	0.940 (0.059)	0.952 (0.055)	0.908 (0.059)
Province					
Prince Edward Island	0.896 (0.146)	0.862 (0.141)	0.996 (0.177)	0.845 (0.144)	0.940 (0.173)
Nova Scotia	1.085 (0.145)	1.050 (0.142)	0.985 (0.158)	1.023 (0.145)	0.930 (0.153)
Newbrunswick	1.108 (0.152)*	1.076 (0.149)	1.021 (0.161)	1.057 (0.154)	0.949 (0.156)
Quebec	0.783 (0.083)	0.757 (0.081)**	0.772 (0.096)*	0.747 (0.084)*	0.759 (0.097)*
Ontario	1.062 (0.117)	1.010 (0.113)	1.094 (0.143)	0.974 (0.114)	1.038 (0.141)
Manitoba	0.982 (0.124)	0.923 (0.119)	0.922 (0.131)	0.875 (0.119)	0.823 (0.127)
Saskatchewan	1.131 (0.158)	1.050 (0.149)	1.125 (0.182)	1.082 (0.161)	1.120 (0.184)
Alberta	1.174 (0.148)	1.128 (0.144)	1.208 (0.175)	1.103 (0.146)	1.161 (0.173)
British Columbia	0.964 (0.110)	0.918 (0.106)	0.989 (0.132)	0.908 (0.110)	0.949 (0.131)
Wage Labour	0.449 (0.022)***	0.581 (0.033)***	0.650 (0.042)***	0.571 (0.035)***	0.648 (0.044)***
Self-Employment	0.473 (0.038)***	0.594 (0.051)***	0.657 (0.064)***	0.561 (0.051)***	0.615 (0.062)***
Religious Attendence	1.002 (0.016)	0.988 (0.016)	0.993 (0.018)	0.988 (0.017)	0.988 (0.019)
Linear Age		0.649 (0.076)***	0.914 (0.042)	0.916 (0.041)*	0.912 (0.044)
Age-Squared		1.024 (0.005)***	1.000 (0.000)***	1.000 (0.000)***	1.000 (0.000)***
Household Income			0.923 (0.011)***		0.916 (0.012)***
Dwelling			0.782 (0.054)***		0.777 (0.056)***
Close Contacts				0.982 (0.003)***	0.984 (0.004)***
Frequency of Contact				1.012 (0.031)	1.009 (0.035)
Number of Positions Assessed				1.053 (0.025)*	1.017 (0.011)
Range of Prestige				0.951 (0.015)**	0.947 (0.017)**
High Prestige				1.003 (0.001)	1.003 (0.001)
Civic Participation: Count				1.053 (0.026)*	1.058 (0.028)*
Civic Participation: Activity				0.997 (0.020)	0.998 (0.022)
N	11691	11684	9379	10933	8914
Constant	1.881 (0.230)***	0.492 (0.108)**	3.019 (0.549)***	1.524 (0.332)***	3.510 (0.898)***
* P<.05; ** P<.01.; *** P<.001.					
Coefficients reported are odds-ratios.					
Bootstrapped standard errors are reported in parentheses.					
Model 5: civic participation activity was statistically significant in the non-mi weighted model and both the MI models .					

Table 4: Health and Activity Limitations Models Continued

Health and Activity Limitations	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Gender	0.954 (0.052)	0.954 (0.052)	0.956 (0.052)	0.948 (0.052)	0.949 (0.052)	0.954 (0.052)	0.950 (0.052)
Education	0.962 (0.009)***	0.963 (0.009)***	0.962 (0.009)***	0.957 (0.009)***	0.957 (0.019)***	0.962 (0.009)***	0.960 (0.009)***
Aboriginal Status	1.421 (0.206)*	1.416 (0.206)*	1.422 (0.207)*	1.405 (0.211)*	1.402 (0.210)*	1.424 (0.207)*	1.410 (0.205)*
Visible Minority Status	0.703 (0.100)*	0.699 (0.099)*	0.704 (0.100)*	0.729 (0.104)*	0.730 (0.104)*	0.702 (0.100)*	0.700 (0.100)*
Immigrant 1	0.595 (0.199)	0.596 (0.199)	0.593 (0.199)	0.622 (0.209)	0.621 (0.209)	0.593 (0.199)	0.570 (0.191)
Immigrant 2	1.021 (0.085)	1.022 (0.085)	1.022 (0.085)	1.049 (0.087)	1.049 (0.087)	1.021 (0.085)	1.024 (0.084)
Rural/Urban	0.928 (0.060)	0.927 (0.059)	0.929 (0.060)	0.914 (0.059)	0.915 (0.059)	0.930 (0.060)	0.947 (0.060)
Province							
Prince Edward Island	0.940 (0.172)	0.942 (0.173)	0.941 (0.172)	0.937 (0.172)	0.936 (0.172)	0.941 (0.172)	0.947 (0.172)
Nova Scotia	0.933 (0.153)	0.929 (0.152)	0.931 (0.152)	0.933 (0.153)	0.936 (0.154)	0.932 (0.152)	0.955 (0.156)
Newbrunswick	0.972 (0.159)	0.972 (0.159)	0.970 (0.158)	0.941 (0.155)	0.943 (0.154)	0.969 (0.158)	0.971 (0.159)
Quebec	0.740 (0.094)	0.738 (0.094)*	0.739 (0.094)*	0.757 (0.098)*	0.759 (0.098)*	0.738 (0.094)*	0.742 (0.094)*
Ontario	1.040 (0.139)	1.040 (0.139)	1.036 (0.138)	1.037 (0.141)	1.040 (0.141)	1.038 (0.139)	1.044 (0.139)
Manitoba	0.841 (0.126)	0.845 (0.126)	0.839 (0.125)	0.814 (0.125)	0.816 (0.125)	0.841 (0.126)	0.844 (0.127)
Saskatchewan	1.115 (0.182)	1.119 (0.182)	1.112 (0.181)	1.105 (0.182)	1.108 (0.183)	1.111 (0.181)	1.122 (0.184)
Alberta	1.167 (0.171)	1.166 (0.170)	1.164 (0.169)	1.152 (0.172)	1.157 (0.173)	1.161 (0.169)	1.178 (0.172)
British Columbia	0.956 (0.130)	0.957 (0.131)	0.954 (0.129)	0.952 (0.132)	0.954 (0.132)	0.956 (0.130)	0.961 (0.131)
Wage Labour	0.654 (0.043)***	0.651 (0.044)***	0.655 (0.044)***	0.653 (0.044)***	0.652 (0.044)***	0.655 (0.044)***	0.662 (0.044)***
Self-Employment	0.639 (0.063)***	0.639 (0.063)***	0.637 (0.053)***	0.622 (0.063)***	0.622 (0.063)***	0.638 (0.063)***	0.654 (0.065)***
Religious Attendence	0.991 (0.019)	0.991 (0.018)	0.992 (0.019)	0.987 (0.019)	0.988 (0.019)	0.991 (0.018)	0.989 (0.018)
Linear Age	0.677 (0.088)**	0.676 (0.088)**	0.673 (0.088)**	0.657 (0.087)**	0.652 (0.087)**	0.677 (0.088)**	0.661 (0.087)**
Age-Squared	1.022 (0.006)***	1.022 (0.006)***	1.022 (0.006)***	1.024 (0.006)***	1.024 (0.006)***	1.022 (0.006)***	1.023 (0.035)***
Household Income	0.914 (0.012)***	0.913 (0.012)***	0.915 (0.012)***	0.913 (0.012)***	0.914 (0.012)***	0.914 (0.012)***	0.915 (0.012)***
Dwelling	0.771 (0.056)***	0.764 (0.055)***	0.772 (0.055)***	0.769 (0.056)***	0.765 (0.056)***	0.775 (0.056)***	0.791 (0.056)**
Close Contacts	0.985 (0.004)***	0.985 (0.004)***	0.985 (0.004)***	0.984 (0.004)***	0.984 (0.004)***	0.985 (0.004)***	0.987 (0.004)**
Frequency of Contact	1.015 (0.035)	1.022 (0.035)	1.014 (0.035)	1.009 (0.035)	1.009 (0.035)	1.015 (0.035)	1.023 (0.035)
Number of Positions Assessed				1.028 (0.025)***	1.029 (0.008)***		
Range of Prestige	0.956 (0.009)***	0.956 (0.009)***	0.956 (0.009)***			0.957 (0.009)***	
High Prestige							0.978 (0.024)
Civic Participation: Count				1.067 (0.025)**	1.057 (0.024)*		1.075 (0.023)**
Civic Participation: Activity	1.032 (0.019)	1.032 (0.019)	1.027 (0.018)			1.031 (0.019)	
Dwelling#Close Contacts	1.005 (0.009)						
Household Income#Close Contacts	0.998 (0.001)						
Dwelling#Frequency of Contact		0.961 (0.078)					
Household Income#Frequency of Contact		0.982 (0.012)					
Dwelling#Civic Participation: Activity			1.021 (0.046)				
Household Income#Civic Participation Activity			1.005 (0.007)				
Dwelling#Civic Participation: Count				1.004 (0.052)			
Household Income#Civic Participation Count				0.991 (0.007)			
Dwelling#Number of Positions					0.997 (0.016)		
Household Income#Number of Positions					0.998 (0.002)		
Dwelling#Range						0.985 (0.023)	
Household#Range						0.999 (0.004)	
Dwelling#High Prestige							0.958 (0.048)
HouseholdIncome#High Prestige							1.010 (0.008)
N	9033	9033	9033	8927	8927	9033	9046
Constant	25.06 (19.05)***	24.71 (18.76)***	25.87 (19.66)***	20.41 (15.61)***	21.18 (16.29)***	24.87 (18.96)***	23.79 (18.18)***
* P<.05; ** P<.01.; *** P<.001.							
Coefficients reported are odds-ratios.							
Bootstrapped standard errors are reported in parentheses.							

Model 1 assessed the relationship between the control variables and health or activity limitations. Significant controls included employment status (wage labour and self-employment), educational attainment, visible minority status, immigrant status and province of residence. In general, those who were employed, both as wage labourers and through self-employment, were less likely to report health or activity limitations than those who were not similarly employed. Similarly, those with higher levels of education, as well as visible minority adults, and immigrants of less than ten years were less likely to report such limitations. Conversely, Aboriginal adults and those living in New Brunswick were somewhat more likely than others to report health or activity limitations.

Model 2 assessed the age and health or activity limitation relationship. Again, the results revealed a significant curvilinear relationship. An odds ratio of 0.649 shows that the change in the odds of having a health or activity limitation decreased by 35 percent within every successive age group. For instance, on average, the 45-49 age group had a probability of 0.65 of not having a health or activity limitation, while the 80 years and older age group had a lower probability of 0.18. However, the quadratic effect shows that this decrease decelerates by 2% (1.024-1) as age increases. To elaborate, the difference between the 0.65 reported by the 45-49 age group and the 0.57 reported by the 50-54 age group was 0.08, whereas the difference between the 79-79 age group and the 80 years and older age group was 0.05.

Model 3 assessed the economic capital and health or activity limitation relationship. The economic capital indicators that were included were household income and dwelling ownership. Once again, the findings revealed that both income and dwelling ownership were significant predictors of health status as those with higher incomes were

less likely to report health and activity limitations as were those who reported owning their own dwellings. For instance, for the no income or loss of income group, the odds of reporting a health or activity limitation was 0.60, while for the group reporting a household income of $100,000 or more, the predicted probability of reporting a health and activity limitation was 0.39. Hence, the lowest income group was 21% more likely to report having a health or activity limitation than the highest income group. For dwelling owners, the probability of reporting a health or activity limitation was 0.44. In contrast, the probability of reporting a health or activity limitation was 0.50 for non-dwelling owners. Hence, predicted probabilities suggest that non-dwelling owners were 6% more likely to report having a health or activity limitation than dwelling owners.

Model 4 assessed the social capital and health or activity limitation relationship. In this model, number of close contacts, civic participation count, number of positions and range of prestige all were found to be significantly associated with having a health or activity limitation. Those with more social contacts were less likely to report activity limitations than those with fewer social contacts. Predicted probabilities suggest that for the one close contacts group, the probability of reporting a health or activity limitation was 0.50, while for the thirty or more close contact group, the predicted probability of reporting a health or activity limitation was 0.38. Hence, individuals having one close contact were 12% more likely to have a health or activity limitation than those having thirty or more close contacts.

For civic participation, the opposite pattern emerged: higher levels of civic participation were associated with a greater likelihood of reporting a health of activity limitation. The predicted probabilities suggest that the probability of reporting a health or

activity limitation was 0.44 for the group who reported participating in zero civic organizations in the past twelve months; meanwhile the predicted probability for the group that participated in five or more civic organizations was 0.53. Hence, individuals participating in no civic organizations in the past twelve months were 11% less likely to report having a health or activity limitation than individuals who participated in five or more civic organizations. This finding is counter-intuitive given that it is expected that social capital and health status would be positively associated. To speculate, one explanation might be that individuals who have a higher level of civic participation are more sensitive to their own health issues. Another explanation might be that individuals with poor health status might participate in civic organizations as a substitute for other forms of socializing (i.e. wage labour).

Two additional measures of bridging social capital also were significantly related to activity limitations: number of positions and range of positions. The number of positions known was positively associated with activity limitations: those who knew people in a larger number of occupational status categories were more likely to report activity limitations than those who knew people in fewer categories. For number of positions assessed, predicted probabilities suggest that for the eighteen positions assessed group, the predicted probability of reporting a health or activity limitation was 0.48 meanwhile for the zero assessed positions group, the predicted probability of reporting a health or activity limitation was 0.43. Hence, an individual who reported knowing no one in the eighteen positions assessed was 5% less likely to report having a health or activity limitation than individuals who knew someone in all eighteen positions assessed. On the other hand, another PGR indicator, range of positions, had a negative relationship with

health and activity limitations as the greater the range of positions one reported knowing, the lower the likelihood of reporting a health or activity limitation. Here, the predicted probabilities suggest that for a range score of 0, the narrowest possible range, the probability of reporting a health or activity limitation was 0.48. In contrast, for the widest range score (83), the predicted probability of reporting a health or activity limitation was 0.43. Hence, an individual with the lowest range was 5% less likely to report having a health or activity limitation than individuals with the widest range.

Model 5 included both economic and social capital variables in the same equation in order to assess mediation effects (i.e., by comparing the results to those obtained in models 3 and 4). Once again, there was no evidence to suggest that social capital mediated the economic capital and health and activity limitation relationship. Both household income and home ownership remained significant predictors of health and activity limitations despite the inclusion of social capital indicators in the model. In contrast, there was some evidence that economic capital mediated the social capital and health status relationship. Specifically, the impact of the number of positions individuals reported knowing shifted from significant to non-significant after the economic capital variables were included in the regression equation.

Finally, models 6-12 assessed whether economic and social capital interacted to explain health or activity limitations. Each model included a pair of two-way interactions between household income and a social capital indicator and dwelling ownership and the same social capital indicator. No significant interaction effects were found between any of the economic and social capital indicators assessed.

Self-Reported Health

Table 5 (models 1-12) presents the findings for self-reported health as a dependent variable. Through ordered logistic regression, these models report odds ratios, and an interpretation of predicted probabilities for statistically significant relationships. Significance tests for coefficients are against H0: exp(b) = 1.0.

Table 5: Self-Reported Health Models

Self Reported Health	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	1.064 (0.042)	1.072 (0.041)	1.151 (0.052)**	1.064 (0.044)	1.115 (0.053)*
Education	1.109 (0.008)***	1.109 (0.008)***	1.074 (0.009)***	1.082 (0.009)***	1.058 (0.010)***
Aboriginal Status	0.538 (0.072)***	0.539 (0.073)***	0.633 (0.091)**	0.532 (0.075)***	0.615 (0.090)**
Visible Minority Status	0.699 (0.069)**	0.709 (0.071)**	0.761 (0.089)*	0.755 (0.080)*	0.796 (0.098)
Immigrant1	1.296 (0.263)	1.362 (0.278)	1.623 (0.335)*	1.411 (0.305)	1.625 (0.364)*
Immigrant2	0.838 (0.053)**	0.829 (0.053)**	0.837 (0.061)**	0.854 (0.056)**	0.861 (0.064)*
Rural/Urban	1.010 (0.046)	1.006 (0.045)	0.978 (0.050)	0.993 (0.047)	0.978 (0.053)
Province					
Prince Edward Island	0.954 (0.124)	0.956 (0.124)	0.913 (0.134)	0.965 (0.138)	0.955 (0.152)
Nova Scotia	0.777 (0.088)*	0.781 (0.089)*	0.869 (0.113)	0.770 (0.093)*	0.876 (0.121)
Newbrunswick	0.655 (0.075)***	0.655 (0.075)***	0.725 (0.010)*	0.691 (0.085)**	0.778 (0.105)
Quebec	0.995 (0.093)	0.998 (0.094)	1.009 (0.103)	1.111 (0.113)	1.116 (0.122)
Ontario	0.930 (0.087)	0.935 (0.088)	0.847 (0.087)	0.944 (0.095)	0.878 (0.096)
Manitoba	0.871 (0.098)	0.876 (0.098)	0.951 (0.118)	0.904 (0.107)	0.991 (0.131)
Saskatchewan	0.788 (0.095)	0.795 (0.097)	0.745 (0.100)*	0.800 (0.105)	0.775 (0.112)
Alberta	0.842 (0.093)	0.849 (0.095)	0.788 (0.096)	0.851 (0.100)	0.835 (0.106)
British Columbia	0.927 (0.097)	0.929 (0.097)	0.864 (0.099)	0.903 (0.100)	0.874 (0.106)
Wage Labour	2.000 (0.088)***	2.094 (0.117)***	1.777 (0.133)***	2.009 (0.117)***	1.743 (0.115)***
Self-Employment	2.164 (0.142)***	2.213 (0.163)***	1.911 (0.157)***	2.054 (0.156)***	1.838 (0.154)***
Religious Attandence	1.025 (0.014)	1.023 (0.013)	1.014 (0.015)	0.979 (0.014)	0.983 (0.015)
Linear Age		1.194 (0.041)***	1.188 (0.047)***	1.184 (0.043)***	1.175 (0.048)***
Age-Squared		0.999 (0.000)***	0.999 (0.000)**	0.999 (0.000)***	0.999 (0.000)**
Household Income			1.123 (0.000)***		1.109 (0.013)***
Dwelling			1.374 (0.000)***		1.339 (0.082)***
Close Contacts				1.018 (0.003)***	1.013 (0.003)***
Frequency of Contact				1.084 (0.029)**	1.094 (0.033)**
Number of Positions Assessed				1.000 (0.008)	0.998 (0.009)
Range of Prestige				1.022 (0.014)	1.016 (0.015)
High Prestige				0.999 (0.001)	0.999 (0.001)
Civic Participation: Count				1.049 (0.021)*	1.045 (0.023)*
Civic Participation: Activity				1.040 (0.019)*	1.036 (0.028)
N	11658	11590	9216	10916	8900
* P<.05; ** P<.01; *** P<.001.					
Coefficients reported are odds-ratios.					
Bootstrapped standard errors are reported in parentheses.					
Model 1: religious attendance was significant in non-weighted models including both non-MI and MI datasets.					

Table 5: Self-Reported Health Models Continued

Self Reported Health	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Gender	1.109 (0.052)*	1.109 (0.052)*	1.107 (0.052)*	1.109 (0.053)*	1.109 (0.053)*	1.108 (0.052)*	1.124 (0.054)*
Education	1.065 (0.009)***	1.065 (0.009)***	1.065 (0.009)***	1.062 (0.009)***	1.062 (0.009)***	1.065 (0.009)***	1.061 (0.010)***
Aboriginal Status	0.605 (0.087)***	0.609 (0.087)**	0.610 (0.087)**	0.617 (0.090)**	0.618 (0.090)**	0.608 (0.087)**	0.615 (0.088)**
Visible Minority Status	0.790 (0.096)	0.788 (0.095)*	0.789 (0.095)	0.798 (0.098)	0.797 (0.097)	0.789 (0.095)	0.796 (0.097)
Immigrant1	1.642 (0.368)*	1.657 (0.368)*	1.653 (0.367)*	1.619 (0.365)*	1.604 (0.362)*	1.649 (0.367)*	1.639 (0.368)*
Immigrant2	0.868 (0.064)	0.871 (0.064)	0.870 (0.064)	0.862 (0.063)*	0.863 (0.063)*	0.869 (0.065)	0.862 (0.632)*
Rural/Urban	0.974 (0.052)	0.975 (0.052)	0.976 (0.051)	0.972 (0.052)	0.972 (0.052)	0.974 (0.052)	0.963 (0.050)
Province							
Prince Edward Island	0.948 (0.149)	0.949 (0.149)	0.946 (0.148)	0.951 (0.152)	0.950 (0.152)	0.945 (0.148)	0.938 (0.148)
Nova Scotia	0.870 (0.119)	0.871 (0.119)	0.867 (0.118)	0.870 (0.119)	0.871 (0.119)	0.869 (0.119)	0.856 (0.116)
Newbrunswick	0.759 (0.101)*	0.759 (0.101)*	0.758 (0.101)*	0.770 (0.103)	0.771 (0.103)	0.759 (0.101)*	0.761 (0.101)*
Quebec	1.125 (0.123)	1.123 (0.122)	1.121 (0.121)	1.111 (0.121)	1.113 (0.121)	1.122 (0.122)	1.105 (0.119)
Ontario	0.877 (0.095)	0.877 (0.095)	0.875 (0.094)	0.876 (0.095)	0.877 (0.096)	0.876 (0.095)	0.864 (0.093)
Manitoba	0.986 (0.129)	0.981 (0.129)	0.978 (0.129)	0.985 (0.129)	0.989 (0.129)	0.981 (0.129)	0.975 (0.128)
Saskatchewan	0.784 (0.113)	0.785 (0.112)	0.783 (0.112)	0.767 (0.110)	0.769 (0.110)	0.784 (0.112)	0.769 (0.109)
Alberta	0.831 (0.105)	0.831 (0.105)	0.828 (0.104)	0.835 (0.106)	0.836 (0.106)	0.830 (0.105)	0.817 (0.103)
British Columbia	0.879 (0.106)	0.879 (0.106)	0.877 (0.105)	0.874 (0.106)	0.876 (0.106)	0.878 (0.105)	0.867 (0.104)
Wage Labour	1.749 (0.113)***	1.751 (0.114)***	1.751 (0.114)***	1.730 (0.114)***	1.730 (0.114)***	1.749 (0.113)***	1.172 (0.111)***
Self-Employment	1.842 (0.154)***	1.842 (0.154)***	1.843 (0.154)***	1.824 (0.154)***	1.821 (0.153)***	1.841 (0.153)***	1.819 (0.151)***
Religious Attandence	0.985 (0.015)	0.986 (0.152)	0.985 (0.154)	0.987 (0.015)	0.987 (0.015)	0.986 (0.015)	0.986 (0.015)
Linear Age	1.435 (0.162)**	1.437 (0.162)**	1.433 (0.162)**	1.435 (0.164)**	1.441 (0.165)**	1.426 (0.162)**	1.426 (0.161)**
Age-Squared	0.985 (0.005)**	0.985 (0.005)**	0.985 (0.005)**	0.985 (0.005)**	0.985 (0.005)**	0.986 (0.005)**	0.986 (0.005)**
Household Income	1.112 (0.009)***	1.112 (0.013)***	1.112 (0.013)***	1.110 (0.013)***	1.110 (0.006)***	1.111 (0.013)***	1.108 (0.013)***
Dwelling	1.344 (0.084)	1.364 (0.084)***	1.367 (0.084)***	1.369 (0.086)***	1.382 (0.088)***	1.365 (0.087)***	1.361 (0.086)***
Close Contacts	1.015 (0.003)***	1.014 (0.003)***	1.014 (0.003)***	1.013 (0.003)***	1.013 (0.003)***	1.014 (0.003)***	1.012 (0.003)***
Frequency of Contact	1.104 (0.032)**	1.105 (0.032)**	1.104 (0.032)**	1.097 (0.033)**	1.097 (0.033)**	1.106 (0.032)**	1.096 (0.031)**
Number of Positions Assessed				0.999 (0.006)	0.998 (0.006)		
Range of Prestige	1.002 (0.008)	1.002 (0.009)	1.002 (0.009)			1.003 (0.003)	
High Prestige							0.977 (0.021)
Civic Participation: Count				1.067 (0.019)**	1.069 (0.019)***		1.064 (0.018)***
Civic Participation: Activity	1.057 (0.017)**	1.056 (0.017)**	1.057 (0.017)***			1.057 (0.017)**	
Dwelling#Close Contacts	0.992 (0.008)						
Household Income#CloseContacts	0.999 (0.001)						
Dwelling#Frequency of Contact		1.051 (0.077)					
Household Income#Frequency of Contact		0.996 (0.012)					
Dwelling#Civic Participation: Activity			1.034 (0.038)				
Household Income#Civic Participation: Activity			0.997 (0.006)				
Dwelling#Civic Participation: Count				1.060 (0.046)			
Household Income#Civic Participation: Count				0.997 (0.007)			
Dwelling#Number of Positions Assessed					1.019 (0.014)		
Household Income#Number of Positions Assessed					0.999 (0.002)		
Dwelling#Range of Prestige						0.988 (0.021)	
Household Income#Range of Prestige						1.003 (0.003)	
Dwelling#High Prestige							0.965 (0.041)
Household Income#High Prestige							1.000 (0.007)
N	9019	9019	9019	9035	9035	9019	9032
* P<.05; ** P<.01; *** P<.001.							
Coefficients reported are odds-ratios.							
Bootstrapped standard errors are reported in parentheses.							

Model 1 assessed whether the control variables explained variations in the probability of individuals reporting poor, fair, good, very good, or excellent health status. In multivariate analyses, gender, immigrant status of less than ten years, rural-urban residence, and religious group participation were not significant predictors of self-reported health. Conversely, significant control variables included employment status (wage-labour and self-employment), educational attainment, aboriginal status, visible minority status, immigrant status of ten or more years, and province (i.e., New Brunswick compared to Newfoundland). Those who were employed, both as wage labourers and through self-employment, were likely to have better self-reported health than those who were not similarly employed. Those with higher levels of education also tended to report better health. In contrast, however, those who reported being a member of a visible minority group, Aboriginals and long-term immigrants reported poorer health. So too did those living in Nova Scotia and New Brunswick. Model 2 assessed the age and self-reported health relationship. Again, the results revealed a significant curvilinear relationship.

Model 3 assessed the economic capital and self-reported health relationship. The findings indicated that household income and dwelling ownership were both significant predictors of self-reported health status. In general, the predicted probability of reporting poor, fair and good health was higher, and the probability of reporting very good and excellent health was lower, for individuals living in households with no income or loss of income compared to those in households reporting incomes of $100,000 or more. For example, the predicted probability of reporting poor health was 0.09 for the no income or a loss of household income group, and 0.03 for the household income of $100,000 or

more group, while the predicted probability of reporting excellent health was 0.08 for the no household income or loss of household income group, and 0.22 for the $100,000 or more group. In addition, the predicted probability of reporting poor, fair and good health was lower while the probability of reporting very good and excellent health was higher for dwelling owners than non-owners. For example, the predicted probability of reporting poor health was 0.05 for non-owners, and 0.04 for owners meanwhile the predicted probability of reporting excellent health was 0.15 for non-dwelling owners, and 0.19 for dwelling owners.

Model 4 assessed the social capital and self-reported health relationship. Here, number of close contacts, frequency of contact, civic participation count, and civic participation activity were all significantly associated with self-reported health. In general, those with more social contacts, more frequent contacts, and greater (more extensive and more frequent) civic participation reported better health. For example, the predicted probability of reporting poor health was 0.05 for the zero close contacts group compared to 0.03 for the thirty or more close contacts group. In contrast, the predicted probability of reporting excellent health was 0.15 for the zero close contacts group and 0.23 for the thirty or more close contacts group. With regard to frequent contacts, the predicted probability of reporting poor health was 0.05 for the group with an average frequency of 'not in the past month' compared to 0.01 for the group with an average frequency of contact with friends and family of every day. Conversely, the predicted probability of reporting excellent health was 0.13 for the group with an average frequency of contact with friends and family as 'not in the past month' compared to 0.63 for the group with an average frequency of contact with friends and family of every day.

The lowest frequency of contact group was 48% less likely to report excellent health than the highest group. Finally, the predicted probability of reporting poor health was 0.05 if a person was a member of zero organizations, and 0.03 if they participated in five or more organizations. In contrast, the predicted probability of reporting excellent health was 0.17 if one was a member of zero organizations, and 0.20 if one was a member of five or more organizations. Similarly, the predicted probability of reporting poor health was 0.05 for the group that had not participated in an organization in the last year, and 0.04 for the group that had participated at least once weekly. The predicted probability of reporting excellent health was 0.17 for the group that had not participated in an organization in the last year, and 0.19 for the group that had participated at least once a week.

Model 5 included both economic and social capital variables in the same equation in order to assess mediation effects (i.e., by comparing the results to those obtained in models 3 and 4). Once again, there was no evidence to suggest that social capital mediated the economic capital and health and activity limitation relationship. The impact of both income and home ownership on perceived health status changed little following the inclusion of social capital measures in the equation. However, again there was some evidence that economic capital mediated the social capital and health status relationship with the impact of civic participation activity on perceived health shifting from significant to non-significant following the inclusion of the economic capital indicators in the analyses.

Finally, to assess moderation effects, models 6-12 examined whether economic and social capital variables interacted to explain self-reported health. Each model included two two-way interactions between household income and a social capital

indicator and dwelling ownership and the same social capital indicator. Once again, no significant interaction effects were found between the economic and social capital indicators assessed.

Summary

At the individual level, there was evidence that economic capital (household income and home ownership) had statistically significant main effects on all three health status indicators in all models, with more economic capital being indicative of better health status. The impact of social capital indicators was less consistent, with the number of close contacts (a measure of bonding social capital) being the only social capital variable with a statistically significant main effect across all three health status indicators. Other social capital measures showed inconsistent relationships. There was some evidence that economic capital mediated the social capital and health status relationship, as changes in the impact of social capital measures on health outcomes were found with the inclusion of economic capital on each health status indicator. However, not all relationships were in the same direction. Finally, there was consistently no support for moderating effects between economic and social capital in influencing health status. It is also worth noting that evidence was found for a curvilinear age effect in all models, and on all health status indicators. In the next chapter, the implications of these findings are discussed.

Chapter 5: Discussion

This thesis addressed the impact of individual level economic and social capital on the health of Canadian adults aged 45 and older. It had three research objectives. The first was to examine whether, and the extent to which, economic and social capital directly impact health status in middle and later life. The second was to examine whether, and the extent to which, economic and social capital mediate the effects of each other in influencing health status among middle-aged and older adults. Finally, the third was to examine whether, and the extent to which, economic and social capital interact to impact health status among middle-aged and older adults. This chapter proceeds through the research objectives, discussing the findings and their implications in the context of existing theoretical and empirical literature. Lastly, the implications for policy and practice are discussed.

The Main Effects of Economic and Social Capital

The first objective of this study was to examine the main effects of economic and social capital in influencing health status in middle and later life. As expected, the findings revealed that economic capital explained variations in health status across all three health indicators for adults aged 45+, both at the bivariate level and when other factors (including age and other control variables) were included in the models. Overall, economic capital and health status were positively associated, suggesting further support for the claim that socioeconomic inequalities in health are evident among middle-aged and older adults in Canada (Birch, et al., 2000; Denton, et al., 2004; Denton & Walters,

1999; Humphries & van Doorslaer, 2000; Kosteniuk & Dickinson, 2003). In particular, these findings support prior research (Humphries & van Doorslaer, 2000) suggesting that higher household income is indicative of better self-reported health. In addition, these findings support prior research in the United States (Robert & House, 1996) and Britain (Arber & Ginn, 1993) which found that financial assets, especially liquid assets, are important predictors of health inequalities among older adults, with home ownership being indicative of better health status, even when controlling for household income.

These findings also provide a measure of support to some theoretical traditions. For example, one explanation for socioeconomic status inequalities in health has been articulated by Link and Phelan (1995) who proposed a theory of fundamental cause. The authors suggest that the association between SES and morbidity and mortality persists regardless of the specific mechanisms involved, including disease, illness or other associated risk factors (Link & Phelan, 1995). The persistence of this pattern is explained by SES which includes an array of resources which protect health no matter what mechanisms are relevant at any given time (Link & Phelan, 2010). There is some empirical support (Phelan et al. 2004; Tehranifar et al. 2009) for fundamental cause theory as inequalities in health are only evident in conditions where risk factors and treatments are known. Insofar as the findings of the study reported here indicate that economic factors remain important predictors of health inequalities among middle-aged and older adults regardless of other factors would seem to provide a measure of support for this explanation.

In light of the findings, it would appear that a theory of health inequalities in middle and later life should include both forms of capital, including both types of

economic capital and both types of social capital. Overall, these findings support other studies suggesting that individual-level social capital has an independent main effect on health status when controlling for economic capital (Ahnquist 2012; Baum, 2004; Carlson, 2004; Giordano & Lindstrom, 2010; Pickett & Pearl, 2001; Rose, 2000). In addition, this study adds: (1) that both individual level bonding and bridging social capital are positively associated with health status in Canada (with some exceptions for bridging capital on number of chronic conditions and health or activity limitations), and (2) that this association is evident in middle and later life.

Of the seven social capital indicators assessed in this study, high prestige was the only non-significant indicator evident in all models. Frequency of contact with others was positively associated with self-reported health, supporting previous research suggesting that social connectedness is positively associated with health status (Berkman & Syme, 1979; Brown & Harris, 1978; Cobb, 1976; Lynch, 1977). As well, the number of close contacts people had was positively associated with all three health indicators assessed. With the exception of high prestige, all other bridging social capital indicators were found to be significant in influencing two of the three health status variables (i.e., health and activity limitations and self-assessed health status) in various models. In addition, civic participation activity was a significant predictor of self-reported health status and health or activity limitations, while civic participation count was a significant predictor of self-reported health. These findings support previous research suggesting that associational activity is positively associated with health status (Kawachi & Berkman, 2000; Lochner et al. 2003; Shultz et al. 2008). Among the position generator indices assessed here, number of positions and range of prestige were significant health status

predictors for health or activity limitations only. Considered to be indicators of network diversity (Lin et al., 2001) which create a bridge between networks with various individual and institutional resources, knowing at least one person in a higher status occupational position, and knowing more people in the assessed positions were negatively associated with having a health or activity limitation. Indeed, an important distinction in the social capital literature is between its types: bonding, bridging and linking. While the effects of bonding social capital are important, the level of bridging social capital these relationships embody – the (scarce) resources from institutions and individuals in advantageous as opposed to disadvantaged locales in the occupational structure – are also beneficial for health in middle and later life.

The finding that economic inequalities in health status exist in middle and later life when controlling for well-known social determinants of health (including age) also has some important implications. First, contrary to suggestions that economic inequalities cease to be relevant to well-being over the life course, our findings suggest the continued importance of economic well-being in influencing health outcomes in middle and later life. In addition, research should be conducted that assesses the pathways through which economic capital impacts health status at different points in middle and later life. This could include research assessing the question: how much of the effect of socioeconomic disparities on health status is explained by home ownership and/or other assets in mid-life, and among the young-old, middle-old, and oldest-old? As well, what are the pathways through which home ownership affects health status (e.g., the quality of housing, the autonomy associated with home ownership, the legal benefits accrued

through the ownership of property, the stressors associated with home ownership, and/or its transferability into money)?

Second, research could be conducted to assess relationships between social class and economic capital and/or socioeconomic status insofar as they impact health status in middle and later life. An interesting question to assess is: how much of the relationship between an individual's social class position and health status is explained through the economic rewards distributed in Canadian society?

The finding that social capital inequalities in health exist in middle and later life when controlling for well-known social determinants of health (including age) also has a couple of important implications for future research. First, an issue briefly touched upon in the literature review was the need to deal with the endogeneity of social capital – that is, establishing the direction of the associations between trust, social networks, social support, and other forms of social capital. Second, further assessment of the relationship between individual-level bridging and bonding social capital would be an asset to understanding health in middle and later life. For example, a study which assesses the moderating effects of the two types would help clarify whether and how the effects of bonding social capital on health may depend on the level of bridging social capital and/or vice versa.

Finally, these findings also have important implications for social and public health policy which seeks to minimize health inequalities in middle and later life. First, by considering the role of neoliberal policies in producing and reproducing social inequality in Canada over the past three decades, national policies directed towards closing the gap in social inequality would also be expected to close the gap in health

inequalities in middle and later life. As well, by implication, policy attempts to shift Medicare coverage to private plans will likely widen these inequalities to varying degrees. Furthermore, the fact that some health services most frequently used by those with fewer economic resources (e.g., home care) are excluded from coverage under the *Canada Health Act* means that individuals who have more economic capital may have more consistent and better quality health care. However, Medicare can only reduce health inequalities so much while relatively high levels of social inequality persist. Hence, to reduce the health inequality gap in Canada requires a national strategy to deal with the role of economic capital – including beginning to assess issues of wage stagnation, unemployment and underemployment, a regressive taxation and redistributive system, and increased inequality over the last three decades.

Second, findings indicating that both bonding and bridging social capital are beneficial for health in middle and later life suggests a role for interventions targeted at enhancing such forms of capital for disadvantaged individuals and groups. The same is evident with regard to structural social capital - that is, the structure of social networks (i.e., size, range, and density) and their embedded resources. These findings suggest that improvements in access to such resources may well have benefits for health in middle and later life.

The Mediation Effects of Economic and Social Capital

Multivariate statistical analyses allowed for an assessment of mediation effects to provide insight into the research question: "To what extent do economic capital and social capital mediate the effects of each other in influencing health status among middle-

aged and older adults?" To accomplish this second objective, models that included economic capital but excluded social capital, and vice versa, were compared with models that included both.

Assessment of the findings revealed no evidence that social capital mediated the economic capital and health status relationship. Indeed, there was no major impact of economic capital indicators depending on whether or not social capital indicators were included in the model. Hence, when assessed at the individual level, neither bonding nor bridging social capital were found to be mechanisms which explained the effects of economic capital on health status in middle and later life.

These findings run counter to prior research suggesting that social capital does mediate the economic capital-health status relationship (e.g., Altshuler et al, 2004; Bolin et al. 2003; Elgar et al. 2010; Ichida et al. 2009; Kawachi et al., 1997; Kondo et al., 2011; Schultz, 2008; Sirven, 2006). There may be several reasons for this contradictory finding: the social capital indicators assessed here were individual-level rather than aggregate measures (e.g. Ichida et al., 2009; Kawachi et al., 1997); the data were from Canada rather than Japan (e.g. Ichida et al., 2009; Kondo et al., 2011), the United States (Kawachi et al., 1997), and Madagascar (Sirven, 2006); the sample included adults aged 45 years and older, rather than 65+ (Ichida et al., 2009) and 18+ (Kawachi et al., 1997; Sirven, 2006) assessed different health outcomes such as mortality (Kawachi et al., 1997). As well, the economic capital indicators used were household income rather than personal income, and the health status indicators assessed here were not the same as those used in other studies (i.e. assessments of mortality and mental health).

While additional research is needed to confirm these findings, the findings reported here would suggest that the economic capital and health status relationship is robust enough that the number of close contacts, frequency of contact with those contacts, frequency of civic participation, and knowledge (including the number, range, and maximum) of persons occupying a higher position in the Canadian occupational structure, have no significant effect on the relationship in middle and later life.

Conversely, there was some evidence to suggest that economic capital served to mediate the social capital-health status relationship. For instance, when the models including social capital and excluding economic capital were compared to the models including both, number of close contacts was no longer a significant predictor of number of chronic conditions. As well, civic participation activity was no longer a significant predictor of health or activity limitations. These findings suggest that, in part, individual level economic capital explains the social capital-health status relationship in middle and later life. That is, the effect of bonding social capital on number of chronic conditions is, in part, explained through economic capital. This suggests that social capital indirectly affects health status through economic capital.

These findings have several important implications for theory, research, policy and practice. Bourdieu (1986) suggested that forms of capital may be converted, and that non-economic guises may eventually produce economic outcomes. Following Bourdieu (1986), Veenstra (2002) has suggested that economic and social capital are somehow comingled based on findings indicating that income inequality was not as strongly related to age-standardized mortality after controlling for social capital and vice versa. The findings reported here begin to clarify the direction of this relationship in middle and later

life. First, since both the bonding social capital and health status relationship, and the bridging social capital and health status relationship, were found to be mediated by economic capital, the implication is that economic capital is a pathway through which individual-level social capital impacts health status. Conversely, however, there was no evidence that individual-level social capital was a pathway intervening in the economic capital and health status relationship. Consequently, a theory of individual-level economic and social capital in middle and later life should emphasize that social capital may be a more upstream social determinant of health than economic capital, at least in terms of its impact on the selected aspects of health status assessed here.

The implications of these findings for future research are twofold. First, path analyses which model the unexplained effects of individual level economic and social capital on health status in middle and later life would be valuable so that we can elucidate how much of the effect of social capital on health status is explained by economic capital and what other pathways are unexplained. Second, social capital has been assessed here at the individual level. A multi-level model which assesses the mediation effects between, for instance, social capital at neighbourhood, community and/or provincial levels, and individual level economic capital on health status in middle and later life would be an asset. For example, does being an equivalently wealthy individual in a poor or wealthy neighbourhood, and/or in a social capital intensive or deprived neighbourhood, matter for health status? And if so, how? Such analyses would begin to provide empirical insight to debates between the so-called "communitarian" and "resource-based" perspectives on social capital, as well as to debates over whether and how economic and social capital relate to one another across levels to impact health status. Some multi-level analyses of

social capital on health status have been recently conducted on neighbourhoods, communities and provinces/states. Overall, the findings indicate that ecological levels of social capital perform a protective function on mental health in Japan (Hamano, et al. 2010); on self-reported health in Japan (Fujisawa et al., 2009) and Europe (Rostilla, 2007; Snelgrove et al., 2009); and on quality of life in the U.S. (Kim, et al. 2007). Furthermore, recent studies have begun to assess the cross-level interactions between individual and ecological levels of social capital on self-reported health status in South Korea (Han et al., 2012) and the United States (Kim & Kawachi, 2006). However, to the author's knowledge, studies on cross-level interactions between individual and aggregate levels of social capital in Canada are non-existent, particularly in middle and later life. As well, cross-level interactions between forms of capital, including economic, social and cultural, are not well understood.

One implication of these findings for policies which have the goal of reducing health inequalities in middle and later life is that they should consider both economic and social capital at the individual level. However, policies should be clear that the benefits of individual level social capital on health in middle and later life is explained, in part, by economic capital's effect on health. As well, at the individual level, social capital is a more upstream social determinant of health than are economic resources.

To conclude, we can state that economic capital appears to mediate the social capital-health relationship in middle and later life, but not the reverse. This has implications for social and public health policy makers given that improving an individual's social capital would be expected to improve health status both directly and indirectly, through economic capital's impact on health status. Next, we discuss the

implications of moderation effects of economic and social capital on health in middle and later life.

The Moderating Effects of Economic and Social Capital

To accomplish the third objective of the study, multivariate statistical analysis allowed for an assessment of moderation effects to provide insight on the research question: "To what extent do economic capital and social capital interact to impact health status among middle-aged and older adults?" That is, to what extent do high or low levels of access to one form of capital intensify the positive or negative health implications of high or low levels of access to another form of capital in middle and later life? Based on previous literature, it was expected that having more social capital, especially bonding social capital, would function to buffer the negative implications of low economic capital in later life. Whether this applies to other forms of social capital (i.e., bridging, linking) was unknown, as was whether economic capital also serves to buffer the negative implications of low social capital. Thus, the study also assessed the interaction between economic capital and bridging social capital.

Our findings revealed no evidence that economic capital and social capital (whether bonding or bridging) interact at the individual level to explain chronic conditions. Similarly, there was no evidence to indicate that economic capital and social capital interacted to explain either health and activity limitations or self-reported health. Consequently, these findings failed to support previous research indicating a moderation effect (Ahnquist et al., 2012; Sun et al., 2009). In addition to the possibility that there are in fact no interactions between these variables, three other possible reasons for the lack of

support found for a moderating effect include the sample, country, and indicators employed. For instance, Sun et al. (2009) found evidence for an interaction effect between individual-level social capital and household income on self-reported health of individuals aged 18 years and older residing in rural China when utilizing dichotomous social capital indicators produced through factor analysis. As well, Ahnquist et al. (2012) assessed a sample of 16-84 year-olds in Sweden, operationalizing social capital in terms of social participation and interpersonal and political/institutional trust. In contrast, the sample utilized in this study included Canadians aged 45+ years, including both rural and urban populations, as well as a series of ordinal level social capital measures which assessed only the structural aspect of bonding and bridging social capital.

The lack of evidence found for interactions between economic and social capital suggests that the relationship between economic capital and health status does not depend on the level of social capital, and that the relationship between social capital and health status does not depend on the level of economic capital. This finding - that individual-level economic and social capital do not appear to interact to influence health status in middle and later life - has implications for the utility of Bourdieu's (1986) notion of the 'fungibility' of the different forms of capital. Specifically, it suggests that they are neither coterminous nor fungible, at least in their effects on the selected dimensions of health status in middle and later life addressed here.

These findings also have implications for future research. First, the failure of the findings to indicate interactions between economic and social capital in influencing health status suggests that this does not occur among Canadians aged 45 and older. Research is needed to confirm this finding, including in different settings and using

different health outcomes. Secondly, however, it may be that there is an interaction effect between economic and social capital in later life but not middle life, or vice versa. It may be reasonable to expect a difference between the two groups given that mid-life is generally characterized by high levels of economic and social capital (e.g. the age as leveller effect). Future research may want to consider assessing moderation effects within as well as across age groups.

The lack of support evident for any moderation effects also has implications for social and public health policies that seek to minimize health inequalities in middle and later life. Public policy should take into account the evidence that, for instance, high social capital does not appear to buffer the negative consequences of low economic capital on health status in middle and later life. In other words, health promotion policies and programs which seek to promote more activity in more civic organizations, increase the number of close contacts with whom middle-aged and older adults interact more often, and also the number and range of individuals people known from a variety of positions in the occupational structure, are unlikely to be effective in buffering the negative effects associated with low economic capital. In other words, improving access to social resources does not appear to be a solution to the health problems associated with a lack of economic resources. On the other hand, the negative effects of social capital on health status also will not be buffered by increasing economic resources.

To conclude, we can state that economic and social capital do not appear to interact at the individual level in middle and later life to impact health status. These findings suggest that the forms of economic and social capital assessed here are neither fungible nor coterminous in their effects on health status in middle and later life. Thus,

the relationship between the two in theory should be reassessed. However, we should err on the side of caution given the uniqueness of the sample, country and indicators assessed in studies to date. In addition, further research is needed to assess such effects in other age groups. This also has important implications for social and public health policy, given that improving an individual's social capital in middle and later life would not be expected to substitute for the effects that a lack of economic capital have on health status (and vice versa).

Additional Social Determinants of Health

As expected, several control variables were found to be significant predictors of health status in this study. In fact, all controls, with the exception of urban or rural residence and religious group participation, were significant predictors of at least one health status indicator. It is worth noting that a curvilinear (quadratic) relationship between age and health status was found for all three indicators assessed.

Social class proxies, including both wage-labour and self-employment, were significant predictors of health status in all models across all three dependent variables, with employment in wage-labour and self-employment being indicative of better health status. These findings support previous research suggesting that labour force participation has a positive relationship with physical and self-reported health in Canada (Kosteniuk & Dickinson, 2003). Furthermore, these indicators had a positive relationship with health status in models which included education, economic capital and social capital indicators. This suggests that labour force participation differences in health cannot be equated with

or reduced to the effects of socioeconomic and economic capital differences in health status in middle and later life.

As well, gender was a significant predictor of the number of chronic conditions in all models, with women having a greater number of chronic conditions than men. This suggests that the relationship between economic capital and health across the life course is gendered, with women generally living longer, and with poorer health status than men (Mishra et al, 2004). However, gender was not a significant predictor of whether an individual had a health or activity limitation in any of the models. As well, gender was not a significant predictor of self-reported health status in models with other control variables entered, nor in models that included social capital measures. However, gender was a significant predictor of self-reported health in all models that included economic capital indicators. For instance, suggesting that economic capital suppressed the gender and self-reported health status relationship in middle and later life.

Educational status was also expected to be an important predictor of health status. In fact, educational status was a significant predictor of health status across all three health status indicators, with higher education predicting better health status. Furthermore, regardless of whether economic capital or social capital measures were introduced into the analyses, educational status remained a significant predictor of health status with higher education being indicative of better health status. This supports previous findings that education status independently explains health status when controlling for economic and social capital (Frytak et al., 2003). Education status is often considered a form of institutional cultural capital (Bourdieu, 1986), a scarce resource that when expropriated on an exclusive bases, is advantageous to the life choices and chances

of individuals. Future studies could assess relationships between cultural, economic and social capital in impacting health status in middle and later life.

Like educational status, Aboriginal status was expected to be a strong predictor of poor health given that previous research on the health of Aboriginal Canadians has shown their health to be poorer than that of the overall Canadian population (CIHI, 2004). Indeed, Aboriginal status was a significant predictor of health status across all models and indicators assessed here. Furthermore, the finding that it remained significant despite the introduction of measures of economic and social capital into the analyses suggests that its negative impact on health cannot be accounted for by these factors.

As expected, visible minority status was also a predictor of health status, with a negative association evident with self-reported health and with having a health or activity limitation. However, visible minority status was not a significant predictor of the number of chronic conditions, contradicting research suggesting that visible minority status is associated with fewer chronic conditions (McDonald & Kennedy, 2004). As well, it is worth noting that the significance of visible minority status decreased for all health indicators once other major variables were introduced into the analyses. For self-reported health status, visible minority adults were more likely to report having worse health; however this became non-significant in the latter models. For health or activity limitations, visible minority adults were less likely to report having a health or activity limitation; however, minority status remained significant despite dropping in magnitude in later models. Thus, one reason that visible minorities may have better health status than non-minority individuals, at least in terms of a health or activity limitation, may be that they are more likely to be recent immigrants to Canada.

Immigrant status was also found to be a significant predictor of health status, with immigrants who had been in the country for less than ten years having better health status than everyone else across all models and health status indicators. These findings support previous healthy immigrant effect research suggesting that recent immigrants (resident less than ten years) tend to have better health than the remaining Canadian population, but that after ten years or more following immigration, their health status tends to be similar to that of the Canadian-born population (e.g., see Chui, et al., 2009). Conversely, however, they also contradict some evidence suggesting that this relationship is not necessarily evident within older age groups (Gee et al., 2003). Longitudinal research is necessary to test this relationship. In addition, future research may need to compare the implications of immigrant status among middle-aged and older adults.

Finally, as expected, province of residence was also a significant indicator of health status (Chappell & Penning, 2009). Significant predictors included residence in New Brunswick for self-reported health status, residence in Quebec for health or activity limitations, and residence in Nova Scotia, New Brunswick and Quebec for chronic conditions. Nova Scotia and New Brunswick residents had poorer health than those from Newfoundland and Labrador (the reference group), while Quebec residents had better health. In previous research, Quebec residents have been found to rate their health higher than Saskatchewan residents (Health Canada, 1999). However, Ross et al. (2000) did not find a statistically significant relationship between income inequality and health among Canadian provinces and metropolitan areas.

Overall, these findings suggest that social factors such as gender, employment status, education, Aboriginal status, visible minority status, immigrant status, and

province of residence function as social determinants of health. Moreover, they tend to do so directly rather than indirectly, through economic and social capital.

Summary

To summarize, in accordance with the research questions, four findings came out of the present study. First, both forms of economic capital (household income and home ownership) were important predictors of better health status in middle and later life. Second, both bonding and bridging structural social capital were important predictors of health status in middle and later life. Third, social capital may be a more upstream social determinant of health than economic capital as economic capital mediates the social capital-health status relationship in middle and later life, but not the reverse. Fourth, economic capital and social capital do not interact to impact health status in middle and later life. In Chapter 5, we conclude the study by summarizing the key findings and the implications of these findings.

Chapter 6: Conclusions

The purpose of this study was to assess the main, mediating and moderating effects of individual-level economic and social capital on health in middle and later life. Secondary analyses of General Social Survey Data from the GSS Cycle 22 dataset and a sample of Canadians aged 45 and over were used to assess these effects. The findings revealed that both economic capitals, and bonding and bridging social capital are important predictors of health status; there is some evidence for an economic capital mediation effect between social capital and health status but not the reverse; and there is a lack of evidence for moderation effects between economic and social capital in middle and later life. In this chapter, the implications of these findings for theory, research and policy and practice are summarized, followed by an assessment of the analytic and empirical strengths and limitations of the research.

Implications of the Findings

The research findings had a number of implications for future theory, research and policy and practice. With regard to theory, findings indicating that both household income and dwelling ownership were positively associated with health status in middle and later life suggest that an economic capital theory of health inequalities should consider both forms of economic capital, income and home ownership, as important social determinants of health status in middle and later life. In terms of socioeconomic status, the study only assessed educational attainment and income (household). It is worth noting that a higher level of formal education, wage-labour and self-employment were

also important predicators of health status when included in the same models as economic capital. The theoretical implications of this are that economic capital cannot be reduced to employment status and SES in their impact on health status in middle and later life, and the reverse is also evident. This raises an important question for future research: Do social class, socioeconomic status and economic capital mediate one another and/or interact to impact health status in middle and later life? In terms of economic capital, this study confirmed that home ownership and household income, when controlling for one another, influence health status in middle and later life.

As both bonding and bridging social capital were positively associated with health status in middle and later life, future studies of social capital in middle and later life should assess both forms as predictors of health status. This also has implications for the body of social support literature which primarily assesses bonding social capital in middle and later life. The evidence here suggests that both having close relationships and the latent resources those relationships embody depending on their relative position in the Canadian occupational structure, are important for health status in middle and later life. Future research should assess the relationships between these two forms of social capital, including their mediation and moderation effects in middle and later life. For instance, the question emerges: do the benefits of bonding social capital on health status in middle and later life depend on the level of bridging social capital and/or vice versa? As well, is an interaction more evident in groups low in socioeconomic status, in economic capital, and in a relatively disadvantaged position in regard to the mode of production? Finally, the study here also assessed middle-aged and older adults as a whole; it may be useful to assess these differences separately within these age groups, given the changes associated

with the transition from middle life to later life. This finding also has implications for policies which seek to reduce health inequalities in middle and later life by reducing social isolation as it would be expected that the structural resources embedded in those connections are also important.

In addition, findings indicating that structural social capital was positively associated with health status in middle and later life confirm that structural social capital is an important dimension of social capital. It extends this finding into the 45+ age group. Thus, policies which seek to reduce social inequalities in health in middle and later life should target adults in this age group who are low in both forms of structural social capital. However, as the study focused solely on structural social capital, it could not account for cognitive social capital, including perceptions of neighbourhood cohesion such as perceptions of inclusion and trust. The psychological aspects of social capital are important to understand how beliefs guide individual behaviours. One direction for future research is to assess the impact of cognitive and structural social capital in middle and later life in order to assess the question: to what extent does the effect of structural social capital on health status depend on the level of cognitive social capital? This would be useful for helping us to understand whether/how perceptions of trust relate to social inclusion and participation to impact health status in middle and later life.

The finding that, in some ways, social capital is a more upstream social determinant of health than economic capital, while economic capital has main effects that were not a function of social capital, also has important implications for theory. The evidence here suggests that this may well be the case in middle and later life. One future research question which arises from this finding is: how much of social capital's effect on

health status can be explained by economic capital in middle and later life? A path analysis which includes social capital indicators as well as other established mechanisms in the socio-economic inequalities in health relationship in middle and later life would be an asset to our knowledge. This finding suggests that policies solely targeting the economic capital of middle-aged and older adults in order to alleviate socio-economic inequalities in health may be short-sighted. Hence, policies also need to consider the effects of structural bonding and bridging social capital. However, further research would need to be conducted in order to assess the relative benefits on health of investing in these two guises of capital in middle and later life.

The finding that economic capital mediates the social capital – health status relationship in middle and later life, but not the reverse, suggests that a theory of economic and social capital in health should acknowledge this unidirectional relationship. However, we should be cautious given that this finding is not consistent with all other studies. In fact, some other studies have found the reverse – that social capital mediates the economic capital – health status relationship but not the reverse. As aforementioned, this may be due to our sample age so it may be consistent if studies replicated the study among the 45+ age group. One question that arises from this inconsistency is: to what degree do the mediation effects of economic and social capital on health depend on age? For instance we could test the hypothesis that social capital is a more upstream social determinant of health in later life than in early adulthood and mid-life. The policy implications of our findings include the need to consider that when enhancing social capital in middle and later life to reduce health inequalities, this occurs in part through economic capital. As well, enhancing economic capital to reduce health inequalities will

not account for the more upstream effects of social capital on health in middle and later life.

The finding that economic and social capital does not interact to impact health status in middle and later life also has implications for theory, research, and policy and practice. This evidence suggests that economic capital cannot be substituted for social capital, and vice versa, as their effects on health status do not depend on one another. However, it should be noted that these findings are inconsistent with several other studies which have found evidence for an economic and social capital interaction effect on health status. Yet, as the studies differed by sample, it may be the case that there are no interactions in middle and later life, but interactions are evident when young adults are included. Hence, this raises a question for future research: to what degree do the moderation effects of economic and social capital on health depend on age? In other words, are these effects only evident among young Canadians adults? The policy implications for the 45+ age group are such that policies implemented with the goal of reducing health inequalities by targeting either economic or social capital do not need to be overly concerned with the level of the other guise of capital. For instance, policies targeting the enhancement of economic capital for disadvantaged individuals would be expected to be beneficial for their health status regardless of their level of social capital, and vice versa.

Strengths and Limitations

The study's strengths included the fact that it clarified the mediating and moderating effects of economic and social capital among these understudied age groups.

Multiple regression analyses allowed for this assessment to be done while controlling for other important social determinants of health including: gender, education status, aboriginal status, visible minority status, immigration status, rural or urban residence, province of residence, wage labour, employment status, and religious group participation, and age. In doing so, the study adds to our knowledge on economic capital in terms of household income and dwelling ownership, as well as individual level social capital in terms of bonding and bridging forms as they impact health in middle and later life.

The study had both analytic and empirical strengths and limitations. Three analytic strengths should be outlined: (1) the study assessed multiple forms of capital (economic and social), multiple forms of economic capital (household income and home ownership), and multiple forms of social capital (bonding and bridging); (2) its assessment of their implications for health in both middle and later life – a life stage understudied in terms of economic and social capital; and (3) the employment of multiple indicators to assess health status (number of chronic conditions, health or activity limitations, and self-reported health). Empirical strengths included: (1) the study's reliance on a large national sample survey; (2) conservative estimations of variance were employed using bootstraps; and (3) multiple imputations were employed on all replicated models in order to account for the 20% of responses missing on the household income question.

In addition, however, several analytic limitations should also be noted. First, its focus at the individual level meant that the study was unable to contribute to the large debate over whether, or the degree to which, social capital exists at the individual, relational or ecological levels (including neighbourhood, community and state/province).

As many researchers consider social capital to be a characteristic of communities rather than of individuals, a multi-level model which assesses cross-level mediating and moderating relationships within and between the four forms of capital, would be informative to both social theory and population health. For instance, such a model would be able to assess the impact of being wealthy on health in middle and later life in: (1) a neighbourhood deprived of economic and social capital; (2) a neighbourhood abundant in economic and social capital; (3) a neighbourhood abundant in economic capital but deprived of social capital; and (4) a neighbourhood abundant in social capital but deprived of economic capital. Second, the study's inability to identify the (lifestyle, psychosocial, biological, and behavioural) pathways through which economic and social capital affect health is a limitation. Third, the absence of cultural (with the exception of an institutional form) and symbolic capital in the model is a limitation as the goal was to assess forms of capital in addition to those acknowledged in economic theory.

A number of empirical limitations should also be considered: (1) since the data were cross-sectional, the analyses were limited to a synchronic understanding. This is a limitation given that a lack of diachronic analysis means a static model of social life is implied and causality can only be inferred; (2) the study's reliance on secondary data resulted in the use of a limited number of major indicators of economic and social capital (e.g., PGR indices which excluded a number of professions, only assessed knowing one person or no one from these professions, and were highly correlated – suggesting that they underestimate their overall impact on health despite tests indicating no serious problems of multicollinearity), including a reliance on egocentric data; (3) controls were also limited as social class proxies (wage-labour and self-employment) could have been

improved (to assess positions including: owners, financiers, speculators, salaried supervisors, investors, managers and employees, piece work, underemployed and unemployed, and precarious as opposed to steady employment). Variables such as main occupation in life, partner's main occupation in life, and parent's main occupation in life would also have been helpful to understand middle aged and older women's social class location. In addition, whether an individual owns one home or several homes was indistinguishable. As well, whether or not a person had a mortgage, how much money was invested, and the home'(s) economic value were not assessed. As well, indicators of specific illness (i.e., chronic conditions and health or activity limitations) assume that health is merely a deviation from 'normal' functioning, hence missing the psychological and social aspects of living with illness. Self-reported health status is an indicator that attempts to make up for the shortfalls of biomedical indicators. However, while broad indicators of health have the advantage of capturing a more holistic picture of health status, they run the risk of capturing everything as "health", and presenting a single-scale, linear scale of health (individuals may have excellent mental health but poor functional health).

Conclusion

Multivariate analyses allowed for the assessment of our research questions while controlling for well-known social determinants of health. Through the assessment of the of individual-level economic and social capital on health status in middle and later life, this study concludes with four main findings: (1) both economic capitals are beneficial for health status; (2) both bonding and bridging forms of structural social capital are

beneficial for health status (with the exception of some bridging social capital indicators on health or activity limitations and number of chronic conditions); (3) economic capital mediates the social capital – health status relationship, but not the reverse, suggesting that social capital may be a more upstream social determinant of health; and finally (4) economic and social capital do not interact to impact health status in middle and later life.

These findings have potentially important implications for theory, research, and policy. To summarize, a theory of economic and social capital in middle and later life health should: (1) include reference to economic capitals, such as income and assets, while clarifying the relationship between social class, economic capital, and socio-economic disparities in health; (2) a theory of structural social capital should include both bonding and bridging forms of social capital – and this has implications for notions of social support; (3) theoretical models of social determinants of health should conceive of social capital as a more upstream social determinant of health than economic capital; and (4) social capital's effects on health do not depend on the level of economic capital, and vice versa – suggesting that may not be substitutable or "fungible" at the individual level.

In light of these findings, the main suggestions for future research included focusing on questions such as: (1) how do social class, socio-economic status and economic capital inequalities in health relate?; (2) do the benefits of bonding social capital on health depend on the level of bridging social capital, and vice versa?; (3) Does the effect of structural social capital on health depend on the level of cognitive social capital?; (4) Can multi-level models help us to assess the cross-level effects of capitals on health status?; and (5) How much of the effect of social capital on health can be explained by economic capital at the individual level?

Lastly, policies which seeks to reduce social inequalities in health in middle and later life should: (1) enhance both economic capitals as both household income and home ownership are indicative of better health status; (2) enhance both bonding and bridging social capital as distinct forms which enhance health status; (3) enhance both economic and social capital in middle and later life with some assurance that there will be health benefits regardless of the level of the other form of capital.

Endnotes

[i] Figure 2. The class/welfare regime model (Coburn, 2004).

[ii] See Ki et al. (2011) for an example of a health selection study which examines the effects of health status on social hierarchy.

[iii] See Tonnies trans. Community and Society (1887) and Tocqueville *Democracy in America* (1830) for further links to the communitarian perspective (e.g. the distinction between community (informal association) and society (formal association) and the link between participatory democracy and social cohesion).

[iv] See Lin (1999) for a more elaborate discussion of how recent social capital theorists retain continuity and depart from Marx's theory of capital.

[v] The Gini Coefficient is a measure of the inequality of a distribution, commonly used for indicators of income or wealth.

vi See Fries Aging, Natural Death, and the Compression of Morbidity (1980).

vii Go to http://www.statcan.gc.ca/pub/89f0115x/89f0115x2009001-eng.pdf for a more comprehensive history on the Canadian General Social Survey.

[viii] The Cohen (1988) scale was used as a standard for interpreting the strength of correlations.

[ix] Self-perceived health, subjective health, self-assessed health are used interchangeably.

[ix] Go to http://www.statcan.gc.ca/pub/89f0115x/89f0115x2009001-eng.pdf for a more comprehensive history on the Canadian General Social Survey.

[ix] See Perez (2002) and Newbold & Danforth (2003) for examples of Canadian research on the HIE.

[ix] See next assumption– variable was dropped due to multicollinearity

[x] See Mckeown's *The Role of Medicine: Dream, Mirage, or Nemesis* (1977), medical sociologists outline four assumptions of the biomedical model and subsequent criticism

[xi] See Perez (2002) and Newbold & Danforth (2003) for examples of Canadian research on the HIE.

[xi] See next assumption– variable was dropped due to multicollinearity.

[xii] It is not clear why PEI was not included within one of the two categories. However, given the relatively large rural component of the province's population, together with the relatively small size of its urban centres, it will be combined with category (2).

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Appendix A: Correlation Matrices of Major Variables

Adjusted

Variable	Age	Close Contacts	Frequency of Contact	Highest Prestige	Number of Positions	Range of Prestige	Civic Part. Count	Civic Part. Activity	Dwelling Ownership	Household Income	Chronic Conditions	Activity Limitations	Self-Reported Health
Age	1												
Close Contacts	0.0179	1											
Frequency of Contact	-0.0085	0.2957	1										
Highest Prestige	-0.212	0.1887	0.1562	1									
Number of Positions	-0.2853	0.3032	0.02713	0.6209	1								
Range of Prestige	-0.2231	0.2282	0.2041	0.7496	0.7826	1							
Civic Participation Count	0.0028	0.1739	0.1957	0.2081	0.3243	0.2424	1						
Civic Participation Activity	-0.0715	0.2068	0.2317	0.2631	0.4085	0.3005	0.6501	1					
Dwelling Ownership	-0.0916	0.1047	0.0181	0.1905	0.1874	0.1613	0.0788	0.1096	1				
Household Income	-0.362	0.1239	0.0619	0.3344	0.3326	0.2965	0.1677	0.2756	0.3733	1			
Chronic Conditions	0.2306	-0.0264	0.0219	-0.0939	-0.0728	-0.0722	-0.0226	-0.0492	-0.0118	-0.2431	1		
Activity Limitations	0.2004	-0.0452	-0.0009	-0.0741	-0.0485	-0.0323	-0.0024	-0.0195	-0.1013	-0.1945	0.4396	1	
Self-Reported Health	-0.1344	0.0974	0.0873	0.1348	0.1478	0.1207	0.1142	0.1511	0.1463	0.2605	-0.4756	-0.4277	1

Original

Variable	Age	Close Contacts	Frequency of Contact	Highest Prestige	Total Prestige	Number of Positions	Range of Prestige	Civic Part. Count	Civic Part. Activity	Dwelling Ownership	Household Income	Chronic Conditions	Activity Limitations	Self-Reported Health
Age	1													
Close Contacts	0.024	1												
Frequency of Contact	-0.01	0.1788	1											
Highest Prestige	-0.18	0.1418	0.1068	1										
Total Prestige	-0.29	0.204	0.27	0.6003	1									
Number of Positions	-0.28	0.2141	0.2713	0.5547	0.9714	1								
Range of Prestige	-0.21	0.1417	0.1915	0.7564	0.7151	0.735	1							
Civic Participation Count	-0.06	0.139	0.2266	0.2079	0.3908	0.3805	0.2566	1						
Civic Participation Activity	0.005	0.1189	0.1957	0.1897	0.3285	0.3243	0.2293	0.5874	1					
Dwelling Ownership	-0.09	0.0456	0.0181	0.1708	0.2068	0.1874	0.1597	0.0964	0.0788	1				
Household Income	-0.36	0.0587	0.0619	0.2914	0.3831	0.3326	0.286	0.2513	0.1677	0.3733	1			
Chronic Conditions	0.236	0.0055	0.0219	-0.0762	-0.09	-0.0728	-0.0706	-0.0431	-0.0226	-0.118	-0.2431	1		
Activity Limitations	0.197	-0.0106	-0.0009	-0.0626	-0.066	-0.0485	-0.0306	-0.0179	-0.0024	-0.1013	-0.1945	0.4369	1	
Self-Reported Health	-0.13	0.0414	0.0873	0.1124	0.1662	0.1478	0.1143	0.1379	0.1142	0.1463	0.2605	-0.4756	-0.4277	1

Appendix B: Reliability Correlation Test

Test Group A

	Age	Close Contacts	Frequency of Contact	Highest Prestige	Number of Positions	Range of Prestige	Civic Engag. Org.	Civic Engag. Part.	Dwelling	Household Income	Chronic Conditions	Activity Limitations	Self-Reported Health
Age	1												
Close Contacts	0.0014	1											
Frequency of Contact	-0.1396	0.2928	1										
Highest Prestige	0.2102	-0.1854	-0.1754	1									
Number of Positions	-0.2583	0.2763	0.2843	-0.6496	1								
Range of Prestige	0.1972	-0.2165	-0.2169	0.7509	-0.7687	1							
Civic Engagement: Org.	-0.0591	0.2019	0.2363	-0.2889	0.3953	-0.304	1						
Civic Engagement: Part.	-0.0399	0.1598	0.2011	-0.2198	0.3085	-0.2287	0.6476	1					
Dwelling	0.0521	0.0994	-0.0112	-0.1635	0.1581	-0.1449	0.1195	0.08	1				
Household Income	-0.2492	0.1264	0.0526	-0.3422	0.2805	-0.2666	0.2492	0.1689	0.3885	1			
Chronic Conditions	0.328	-0.0405	-0.0291	0.1311	-0.0751	0.0827	-0.0574	-0.0485	-0.0704	-0.2449	1		
Activity Limitations	0.2671	-0.05	-0.0399	0.1032	-0.0512	0.0505	-0.0173	-0.011	-0.0673	-0.198	0.4756	1	
Self-Reported Health	-0.1653	0.1181	0.0991	-0.1543	0.1235	-0.117	0.1471	0.1332	0.1204	0.2608	-0.4785	-0.4233	1

Test Group B

	Age	Close Contacts	Frequency of Contact	Highest Prestige	Number of Positions	Range of Prestige	Civic Engag. Org.	Civic Engag. Part.	Dwelling	Household Income	Chronic Conditions	Activity Limitations	Self-Reported Health
Age	1												
Close Contacts	-0.005	1											
Frequency of Contact	-0.1426	0.2811	1										
Highest Prestige	0.2307	-0.2035	-0.1837	1									
Number of Positions	-0.2559	0.2955	0.2878	-0.652	1								
Range of Prestige	0.2028	-0.2391	-0.2165	0.7515	-0.7738	1							
Civic Engagement: Org.	-0.0328	0.2319	0.2198	-0.2878	0.3974	-0.2939	1						
Civic Engagement: Part.	-0.0145	0.1921	0.1961	-0.2174	0.319	-0.2313	0.6411	1					
Dwelling	0.0448	0.0914	-0.0074	-0.1581	0.1615	-0.1429	0.1314	0.093	1				
Household Income	-0.2771	0.1414	0.0705	-0.3629	0.3024	-0.2881	0.2752	0.1779	0.3896	1			
Chronic Conditions	0.368	-0.0347	-0.0214	0.1341	-0.0807	0.0881	-0.0428	-0.0172	-0.0817	-0.2574	1		
Activity Limitations	0.2716	-0.06	-0.0412	0.1056	-0.0557	0.0539	-0.0376	-0.0187	-0.0657	-0.2175	0.4813	1	
Self-Reported Health	-0.1815	0.1001	0.0986	-0.1687	0.151	-0.1276	0.1551	0.1206	0.1228	0.2682	-0.4666	-0.4252	1

Appendix C: Multicollinearity Diagnostics

Original

Variable	b	Std. Error	t	Sig.	VIF	Tolerance
Age	0.0346	0.001	0	0.032	1.12	0.891
Close Contacts	-0.0001	0	-2.28	0.023	1.07	0.936
Frequency of Contact	0.0025	0.005	0.46	0.643	1.16	0.86
Highest Prestige	-0.0011	0	-2.31	0.021	2.8	0.357
Total Assessed Prestige	-0.0004	0	-4.38	0	18.86	0.053
Number of Positions Assessed	0.0228	0.004	5	0	19.46	0.051
Range of Prestige Scores	0.0009	0	2.02	0.043	3.78	0.026
CivicParticipationCount	0.0045	0.003	1.3	0.192	1.65	0.605
CivicParticipationActivity	0.0031	0.003	0.91	0.361	1.55	0.643
Dwelling	-0.0244	0.011	-2.13	0.033	1.2	0.833
Household Income	-0.023	0.002	-10.9	0	1.37	0.731

Adjusted

Variable	b	Std. Error	t	Sig.	VIF	Tolerance
Age	0.032	0.003	14.11	0	1.24	0.805
Close Contacts	-0.003	0	-4.39	0	1.19	0.842
Frequency of Contact	0.0029	0.006	0.47	0.641	1.17	0.86
HighestPrestige	0	4.35E-06	-3.73	0	2.5	0.399
Number of Positions Assessed	0.0039	0.002	0.05	0	3.16	0.316
Range of Prestige Scores	0	4.78E-06	3.55	0	3.49	0.286
CivicParticipationCount	-1E-04	0.004	-0.02	0.981	1.94	0.515
CivicParticipationActivity	0.0074	0.005	1.52	0.128	1.76	0.567
Dwelling	-0.057	0.015	-3.81	0	1.18	0.848
Household Income	-0.026	0.002	-10.74	0	1.5	0.857

Appendix D: Predicted Probabilities

Predicted Probabilities	Chronic Conditions	HAL	SRH - Poor	SRH-Fair	SRH-Good	SRH-Very Good	SRH-Excellent
Wage-Labour							
Non-Wage Labourers	1.083*** (0.021)	0.542*** (0.007)	0.059*** (0.003)	0.189*** (0.005)	0.364*** (0.005)	0.249*** (0.005)	0.138*** (0.004)
Wage-Labourers	0.684*** (0.028)	0.347*** (0.008)	0.030*** (0.002)	0.113*** (0.004)	0.305*** (0.006)	0.312*** (0.006)	0.239*** (0.007)
Job Autonomy							
Non-Self Employed	1.520*** (0.016)	0.481*** (0.006)	0.051*** (0.002)	0.167*** (0.004)	0.348*** (0.005)	0.268*** (0.005)	0.166*** (0.004)
Self-Employed	0.973*** (0.032)	0.305*** (0.016)	0.024*** (0.002)	0.092*** (0.005)	0.270*** (0.008)	0.319*** (0.006)	0.293***(0.013)
Education							
Elementary School/no schooling	1.644*** (0.029)	0.522*** (0.010)	0.069*** (0.004)	0.214*** (0.007)	0.374*** (0.006)	0.228*** (0.006)	0.115*** (0.005)
Some secondary/high school	1.596*** (0.024)	0.509*** (0.009)	0.063*** (0.003)	0.199*** (0.006)	0.371*** (0.006)	0.240*** (0.005)	0.125*** (0.005)
High school diploma	1.549*** (0.020)	0.496*** (0.008)	0.057*** (0.003)	0.186*** (0.005)	0.366*** (0.006)	0.252*** (0.005)	0.137*** (0.004)
Some trade/technical school	1.504*** (0.017)	0.483*** (0.006)	0.052*** (0.002)	0.174*** (0.004)	0.360*** (0.006)	0.264*** (0.005)	0.149*** (0.004)
Some community college/CEGEP/Nursing	1.460*** (0.015)	0.469*** (0.006)	0.047*** (0.002)	0.161*** (0.004)	0.353*** (0.005)	0.275*** (0.005)	0.163*** (0.004)
Some University	1.417*** (0.014)	0.456*** (0.005)	0.043*** (0.002)	0.149*** (0.004)	0.344*** (0.005)	0.285*** (0.005)	0.178*** (0.004)
Diploma/certificate from trade/technical	1.376*** (0.015)	0.443*** (0.006)	0.039*** (0.002)	0.138*** (0.004)	0.335*** (0.005)	0.295*** (0.005)	0.193*** (0.004)
Diploma/certificate from community college	1.336*** (0.017)	0.429*** (0.007)	0.035*** (0.002)	0.127*** (0.004)	0.324*** (0.005)	0.304*** (0.006)	0.209*** (0.005)
Bachelor's degree	1.297*** (0.020)	0.416*** (0.008)	0.032*** (0.002)	0.117*** (0.004)	0.312*** (0.005)	0.311*** (0.006)	0.227*** (0.006)
Doctorate/Masters/some graduate	1.259*** (0.023)	0.403*** (0.009)	0.029*** (0.002)	0.108*** (0.004)	0.300*** (0.006)	0.318*** (0.006)	0.245*** (0.007)
Visible Minority Status							
Non-Visible Minority		0.467*** (0.006)	0.045*** (0.002)	0.153*** (0.004)	0.337*** (0.005)	0.281*** (0.005)	0.184*** (0.004)
Visible Minority		0.386*** (0.025)	0.063*** (0.006)	0.195*** (0.012)	0.358*** (0.007)	0.245*** (0.011)	0.138*** (0.011)
Aboriginal Status							
Non-Aboriginal Status	1.432*** (0.014)	0.457*** (0.005)	0.046*** (0.002)	0.154*** (0.004)	0.338*** (0.005)	0.279*** (0.005)	0.182*** (0.004)
Aboriginal Status	1.828*** (0.107)	0.561*** (0.030)	0.081*** (0.010)	0.229*** (0.017)	0.365*** (0.006)	0.215*** (0.015)	0.109*** (0.013)
Immigrant Status 1							
Everyone Else	1.449*** (0.014)	0.462*** (0.005)					
Immigrant less than 10 years	0.965*** (0.151)	0.324*** (0.059)					
Immigrant Status 2							
Everyone Else			0.045*** (0.002)	0.157*** (0.004)	0.339*** (0.005)	0.277*** (0.005)	0.179*** (0.004)
Immigrant 10 or more years			0.053*** (0.004)	0.129*** (0.019)	0.316*** (0.021)	0.298*** (0.015)	0.219*** (0.033)
Gender							
Male	1.332*** (0.022)						
Female	1.547*** (0.019)						
Province							
Newfoundland & Labrador	1.403*** (0.051)		0.043*** (0.004)	0.147*** (0.009)	0.332*** (0.009)	0.285*** (0.009)	0.192*** (0.013)
Prince Edward Island	1.352*** (0.077)		0.045*** (0.005)	0.152*** (0.012)	0.336*** (0.010)	0.281*** (0.011)	0.185*** (0.016)
Nova Scotia	1.591*** (0.064)		0.054*** (0.004)	0.175*** (0.009)	0.350*** (0.007)	0.262*** (0.009)	0.157*** (0.010)
New Brunswick	1.573*** (0.058)		0.064*** (0.006)	0.196*** (0.011)	0.359*** (0.006)	0.244*** (0.009)	0.136*** (0.009)
Quebec	1.241*** (0.027)		0.043*** (0.003)	0.148*** (0.005)	0.332*** (0.006)	0.285*** (0.006)	0.191*** (0.007)
Ontario	1.458*** (0.025)		0.046*** (0.003)	0.155*** (0.005)	0.338*** (0.005)	0.279*** (0.006)	0.181*** (0.006)
Manitoba	1.339*** (0.050)		0.049*** (0.004)	0.162*** (0.009)	0.343*** (0.008)	0.273*** (0.008)	0.172*** (0.011)
Saskatchewan	1.513*** (0.065)		0.054*** (0.005)	0.174*** (0.011)	0.349*** (0.008)	0.263*** (0.009)	0.159*** (0.011)
Alberta	1.415*** (0.052)		0.051*** (0.004)	0.166*** (0.009)	0.345*** (0.007)	0.269*** (0.008)	0.168*** (0.010)
British Columbia	1.307*** (0.036)		0.046*** (0.003)	0.155*** (0.006)	0.338*** (0.007)	0.279*** (0.007)	0.181*** (0.008)
Age							
45 to 49	0.952*** (0.051)	0.653*** (0.035)	0.082*** (0.011)	0.212*** (0.010)	0.339*** (0.006)	0.231*** (0.009)	0.135*** (0.008)
50 to 54	1.096*** (0.038)	0.575*** (0.200)	0.070*** (0.007)	0.193*** (0.007)	0.333*** (0.006)	0.247*** (0.007)	0.156*** (0.005)
55 to 59	1.261*** (0.022)	0.497*** (0.006)	0.060*** (0.005)	0.174*** (0.005)	0.325*** (0.007)	0.262*** (0.005)	0.179*** (0.004)
60 to 64	1.451*** (0.018)	0.422*** (0.010)	0.051*** (0.003)	0.156*** (0.004)	0.313*** (0.008)	0.275*** (0.005)	0.204*** (0.007)
65 to 69	1.669*** (0.046)	0.352*** (0.021)	0.044*** (0.002)	0.138*** (0.004)	0.299*** (0.010)	0.285*** (0.005)	0.233*** (0.013)
70 to 74	1.921*** (0.088)	0.288*** (0.028)	0.037*** (0.002)	0.123*** (0.006)	0.284*** (0.013)	0.293*** (0.005)	0.263*** (0.019)
75 to 79	2.211*** (0.144)	0.232*** (0.033)	0.031*** (0.002)	0.108*** (0.008)	0.267*** (0.015)	0.298*** (0.006)	0.295*** (0.026)
80 years and over	2.544*** (0.214)	0.183*** (0.036)	0.026*** (0.003)	0.094*** (0.009)	0.249*** (0.019)	0.300*** (0.007)	0.329*** (0.034)

Predicted Probabilities	Chronic Conditions	HAL	SRH - Poor	SRH-Fair	SRH-Good	SRH-Very Good	SRH-Excellent
Household Income							
No Income or loss	1.807*** (0.078)	0.601*** (0.023)	0.091*** (0.008)	0.259*** (0.014)	0.380*** (0.007)	0.187*** (0.012)	0.083*** (0.007)
Less than $5,000	1.749*** (0.066)	0.582*** (0.021)	0.082*** (0.007)	0.244*** (0.012)	0.382*** (0.006)	0.199*** (0.011)	0.091*** (0.007)
$5,000 to $9,999	1.692*** (0.055)	0.563*** (0.018)	0.074*** (0.006)	0.228*** (0.011)	0.383*** (0.007)	0.213*** (0.009)	0.101*** (0.007)
$10,000 to $14,999	1.637*** (0.045)	0.544*** (0.016)	0.067*** (0.005)	0.214*** (0.009)	0.382*** (0.007)	0.226*** (0.008)	0.111*** (0.007)
$15,000 to $19,999	1.585*** (0.036)	0.526*** (0.013)	0.061*** (0.004)	0.199*** (0.008)	0.379*** (0.007)	0.239*** (0.0080	0.122*** (0.006)
$20,000 to $29,999	1.534*** (0.028)	0.506*** (0.010)	0.055*** (0.003)	0.186*** (0.006)	0.374*** (0.007)	0.251*** (0.007)	0.134*** (0.006)
$30,000 to $39,999	1.484*** (0.021)	0.487*** (0.008)	0.049*** (0.003)	0.172*** (0.005)	0.367*** (0.007)	0.264*** (0.006)	0.147*** (0.005)
$40,000 to $49,999	1.436*** (0.017)	0.468*** (0.007)	0.045*** (0.002)	0.159*** (0.004)	0.359*** (0.006)	0.275*** (0.006)	0.161*** (0.005)
$50,000 to $59,999	1.389*** (0.015)	0.449*** (0.006)	0.040*** (0.002)	0.147*** (0.004)	0.350*** (0.006)	0.286*** (0.006)	0.176*** (0.005)
$60,000 to $79,999	1.345*** (0.018)	0.431*** (0.007)	0.036*** (0.002)	0.135*** (0.004)	0.339*** (0.006)	0.297*** (0.006)	0.192*** (0.005)
$80,000 to $99,999	1.301*** (0.022)	0.412*** (0.007)	0.032*** (0.002)	0.124*** (0.004)	0.328*** (0.006)	0.305*** (0.006)	0.209*** (0.006)
$100,000 or more	1.259*** (0.027)	0.394*** (0.010)	0.029*** (0.002)	0.113*** (0.004)	0.315*** (0.006)	0.314*** (0.006)	0.228*** (0.008)
Dwelling Ownership							
Non-Dwelling Owner	1.551*** (0.036)	0.497*** (0.015)	0.055*** (0.003)	0.181*** (0.007)	0.361*** (0.007)	0.256*** (0.007)	0.147*** (0.007)
Dwelling Owner	1.372*** (0.018)	0.436*** (0.007)	0.040*** (0.002)	0.143*** (0.004)	0.336*** (0.006)	0.288*** (0.006)	0.192*** (0.005)
Close Contacts							
1	1.530*** (0.029)	0.502*** (0.010)	0.055*** (0.003)	0.176*** (0.006)	0.354*** (0.006)	0.262*** (0.006)	0.153*** (0.006)
5	1.498*** (0.022)	0.484*** (0.009)	0.051*** (0.003)	0.167*** (0.005)	0.349*** (0.006)	0.269*** (0.005)	0.162***(0.005)
10	1.458*** (0.016)	0.463*** (0.006)	0.047*** (0.002)	0.157*** (0.004)	0.343*** (0.006)	0.278*** (0.005)	0.175*** (0.004)
15	1.420*** (0.015)	0.442*** (0.006)	0.043*** (0.002)	0.147*** (0.004)	0.335*** (0.005)	0.286*** (0.005)	0.187*** (0.005)
20	1.383*** (0.019)	0.421*** (0.009)	0.039*** (0.002)	0.138*** (0.004)	0.327*** (0.006)	0.294*** (0.006)	0.201*** (0.006)
25	1.347*** (0.026)	0.400*** (0.011)	0.036*** (0.002)	0.128*** (0.005)	0.318*** (0.006)	0.300*** (0.006)	0.215*** (0.008)
30	1.312*** (0.034)	0.379*** (0.015)	0.033*** (0.002)	0.119*** (0.006)	0.309*** (0.007)	0.307*** (0.006)	0.231*** (0.009)
Frequency of Contact							
Not in the past month			0.056*** (0.004)	0.177*** (0.008)	0.353*** (0.007)	0.261*** (0.009)	0.153*** (0.009)
Once a month			0.035*** (0.003)	0.126*** (0.009)	0.314*** (0.010)	0.302*** (0.008)	0.223*** (0.016)
2 or 3 times a month			0.024*** (0.006)	0.085*** (0.018)	0.259*** (0.031)	0.322*** (0.008)	0.311*** (0.052)
Once a week			0.014*** (0.006)	0.056*** (0.021)	0.199*** (0.051)	0.312*** (0.014)	0.414*** (0.095)
A few times a week			0.008*** (0.005)	0.036*** (0.019)	0.145*** (0.060)	0.287*** (0.050)	0.525*** (0.135)
Every day			0.006*** (0.004)	0.023***(0.016)	0.101*** (0.060)	0.238*** (0.081)	0.633*** (0.162)
Civic Participation: Count							
0		0.448*** (0.019)	0.049*** (0.002)	0.161*** (0.005)	0.345*** (0.006)	0.275*** (0.005)	0.170*** (0.006)
1		0.465*** (0.025)	0.047*** (0.002)	0.155*** (0.005)	0.341*** (0.006)	0.279*** (0.005)	0.177*** (0.005)
2		0.483*** (0.067)	0.045*** (0.002)	0.150*** (0.004)	0.337*** (0.005)	0.284*** (0.006)	0.184*** (0.004)
3		0.500*** (0.109)	0.043*** (0.003)	0.145*** (0.005)	0.333*** (0.005)	0.287*** (0.006)	0.191*** (0.006)
4		0.518*** (0.152)	0.041*** (0.003)	0.140*** (0.007)	0.329*** (0.007)	0.292*** (0.007)	0.198*** (0.008)
5		0.532*** (0.195)	0.039*** (0.003)	0.135***(0.008)	0.325*** (0.008)	0.295*** (0.008)	0.205*** (0.011)
Civic Participation: Activity							
Not in the past year			0.048*** (0.002)	0.160*** (0.005)	0.344*** (0.006)	0.275*** (0.006)	0.171*** (0.006)
Once or twice a year			0.047*** (0.002)	0.156*** (0.004)	0.341*** (0.006)	0.279*** (0.005)	0.177*** (0.005)
Once a month			0.045*** (0.003)	0.151*** (0.004)	0.338*** (0.006)	0.282*** (0.005)	0.182*** (0.004)
A few times a month			0.044** (0.003)	0.148*** (0.004)	0.225*** (0.006)	0.286*** (0.006)	0.188*** (0.006)
At least once a week			0.042*** (0.003)	0.143*** (0.006)	0.331*** (0.007)	0.289*** (0.006)	0.194*** (0.008)
Number of Positions Assessed							
0		0.429*** (0.023)					
5		0.441*** (0.014)					
10		0.454*** (0.006)					
15		0.468*** (0.012)					
18		0.479*** (0.021)					
Range of Prestige							
0		0.473*** (0.008)					
42		0.419*** (0.014)					
83		0.365*** (0.032)					

Appendix E: Occupational Scores

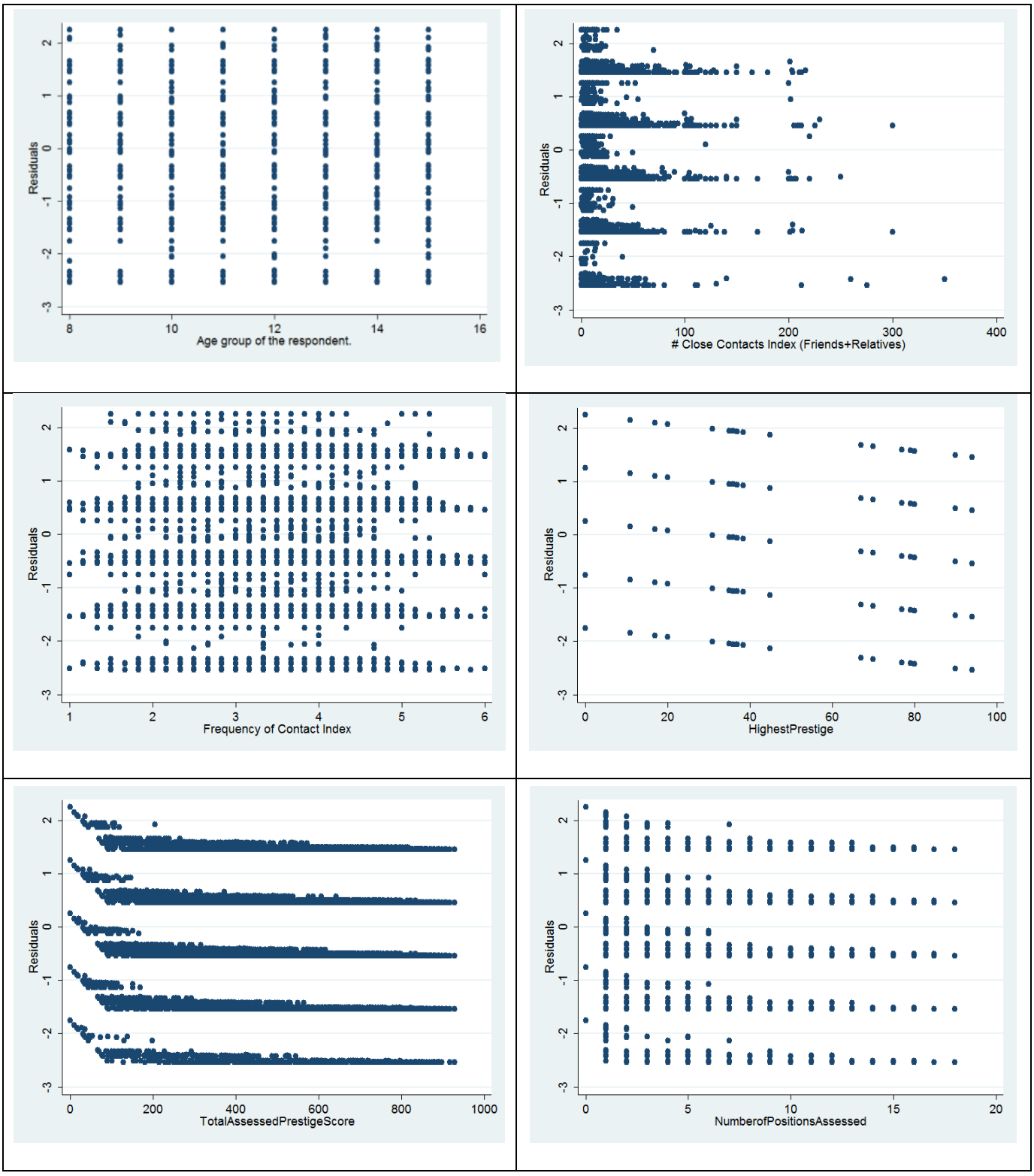
Occupation	Score
Engineers	(94)
Computer programmers	(90)
Managers in sales	(90)
Accountants or Auditors	(80)
Police officers or fire-fighters	(79)
Social Workers	(77)
Marketing or advertising	(73)
Nurse	(70)*
Graphic designers or illustrators	(67)
Instructors or Leaders in recreation and sport	(45)
Early childhood educators or assistants	(38.5)*
Delivery or courier drivers	(37)
Security Guard	(36)
Carpenters	(35)
Farmers	(31)
Food or beverage servers	(20)
Janitors or caretakers	(17)
Labourers in landscaping or grounds maintenance	(11)
Sewing machine operators	(11)

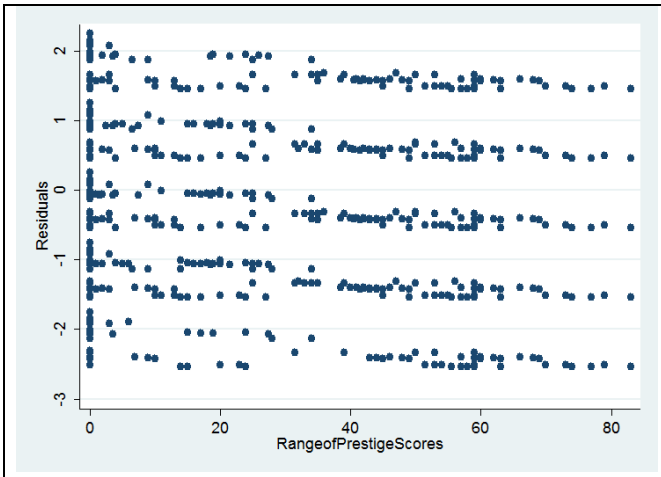
*Occupational scores for RN's are 83 and LPN's 57, however the cycle 22 did not make such a distinction as it only measured "Nurse". To deal with this the scores were added together (83 + 57) and divided by two. This equals an occupation score of 70 for "Nurses".

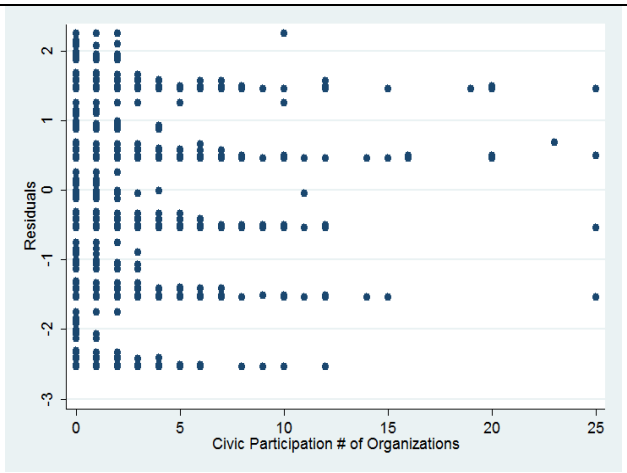
*Occupational scores for preschool educators are 45 and teaching assistants 32, however the cycle 22 did not make such a distinction as it only measured "Early childhood educators or assistants". To deal with this the scores were added together (45 + 32) and divided by two. This equals an occupation score of 38.5 for "Early childhood educators or assistants".

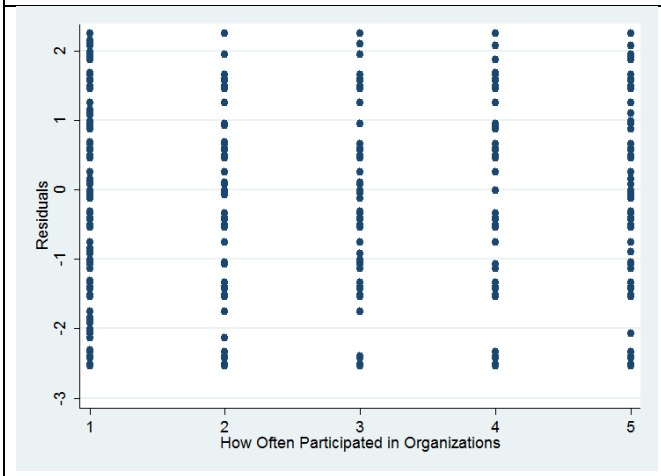
Appendix F: Scatterplots

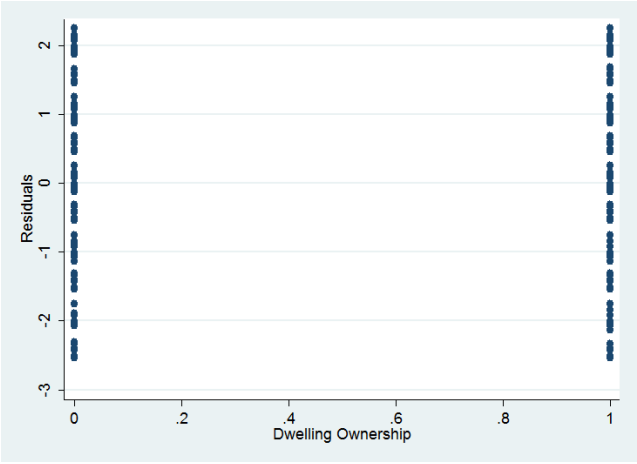
F.1: Scatterplots of Chronic Condition residuals against values of Independent Variables

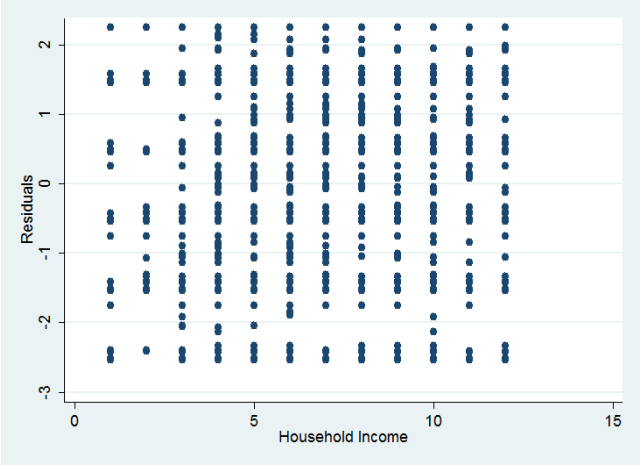



Residuals
RangeofPrestigeScores

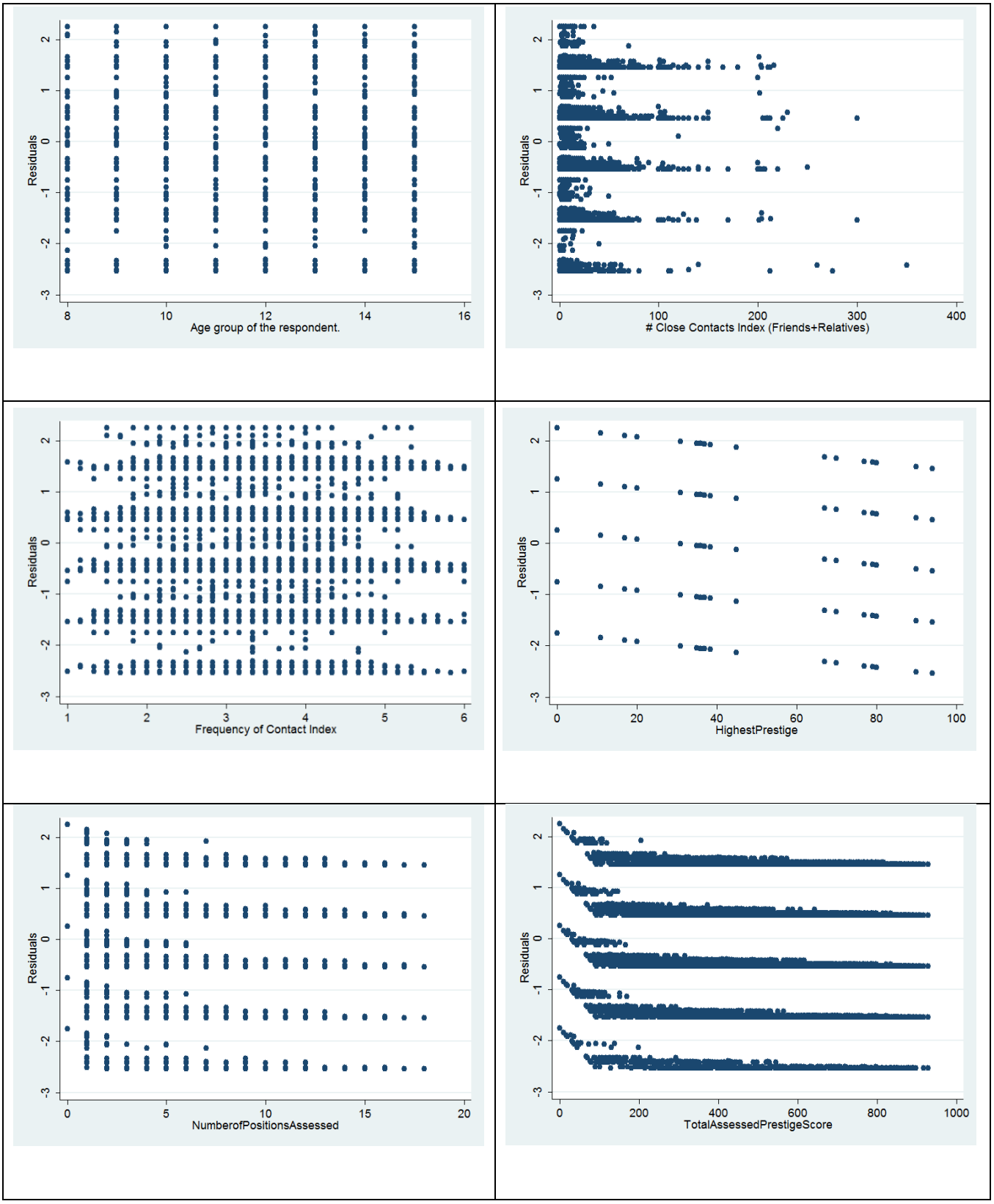

Residuals
Civic Participation # of Organizations

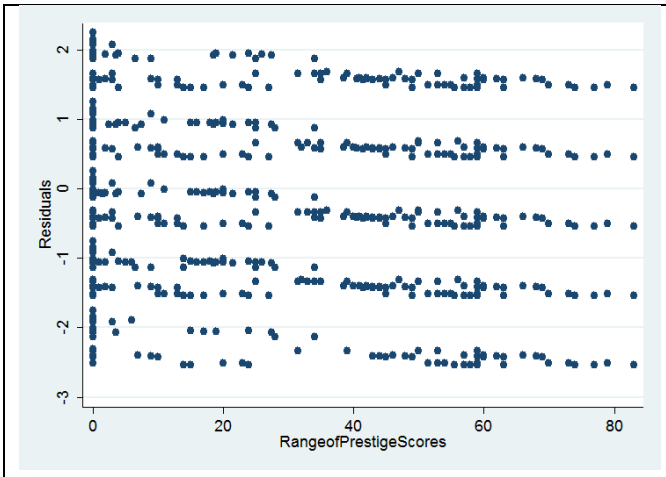

Residuals
How Often Participated in Organizations

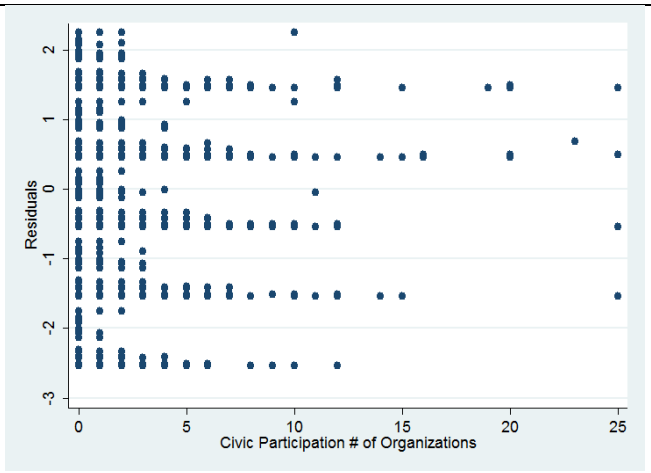

Residuals
Dwelling Ownership


Residuals
Household Income

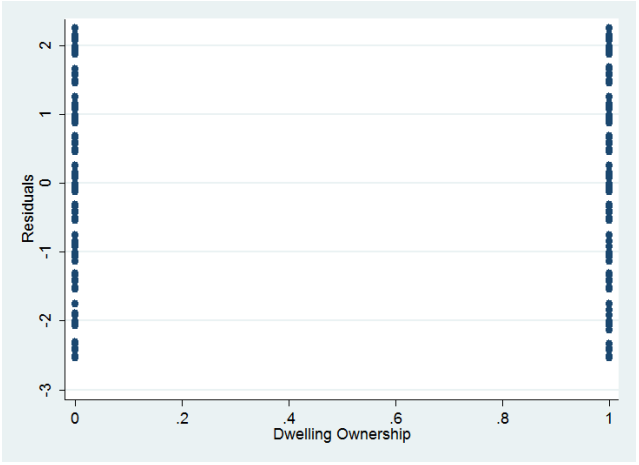
F.2: Scatterplots of Activity Limitations residuals against values of Independent Variables

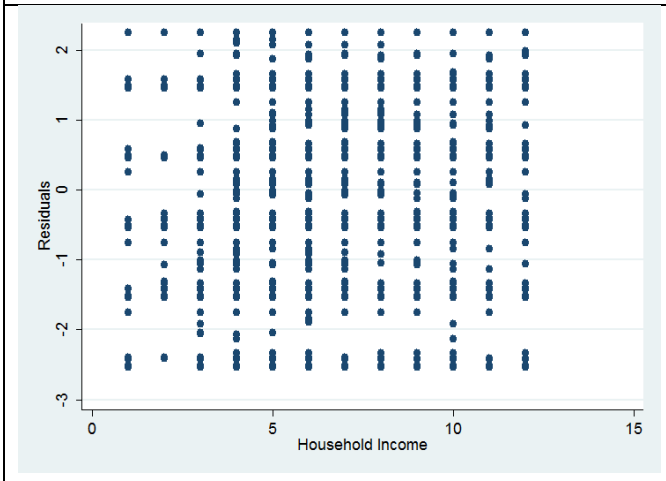



Residuals
-3
-2
-1
0
1
2
0
20
40
60
80
RangeofPrestigeScores

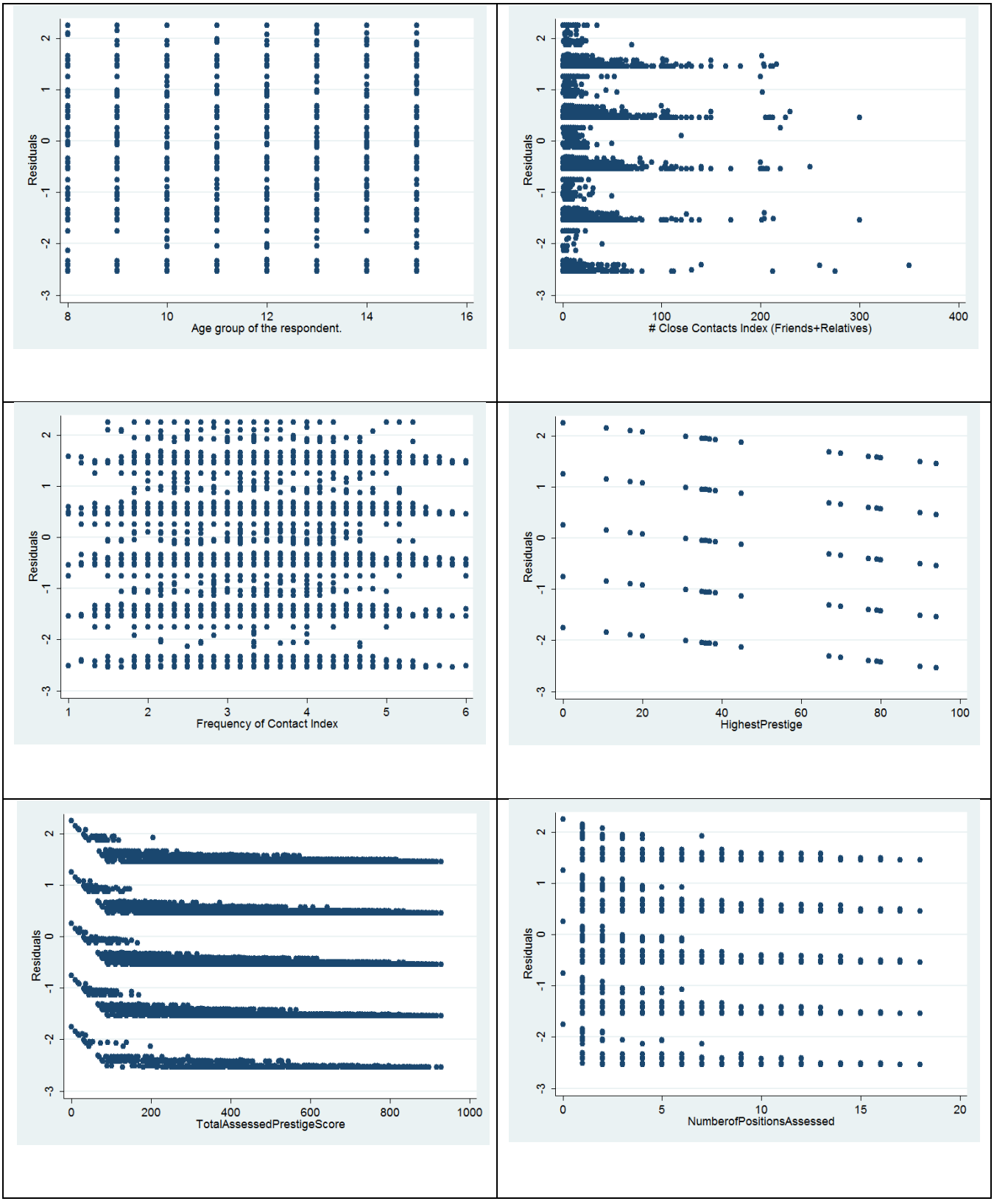

Residuals
-3
-2
-1
0
1
2
0
5
10
15
20
25
Civic Participation # of Organizations

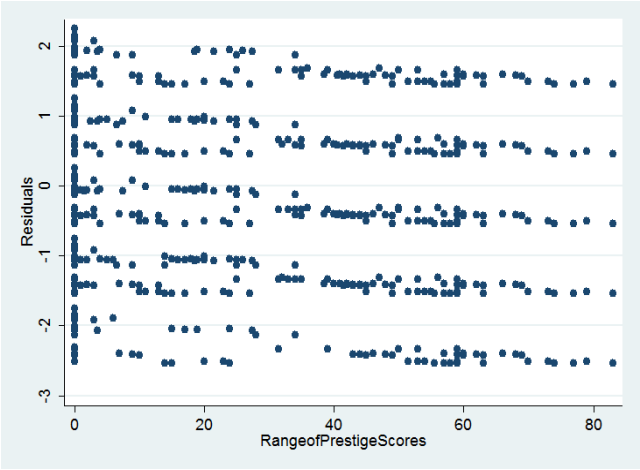

Residuals
-3
-2
-1
0
1
2
1
2
3
4
5
How Often Participated in Organizations

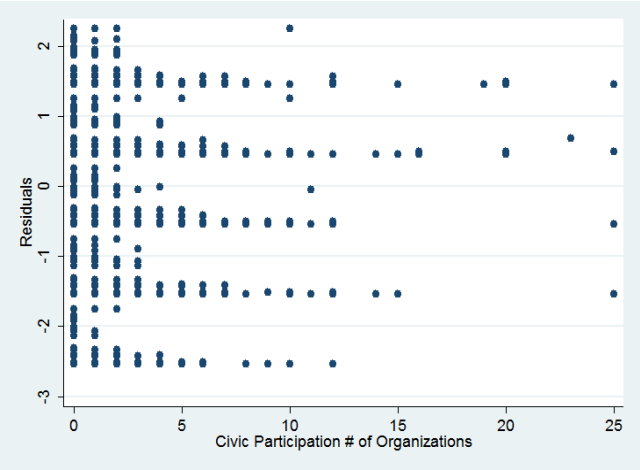

Residuals
-3
-2
-1
0
1
2
0
.2
.4
.6
.8
1
Dwelling Ownership


Residuals
-3
-2
-1
0
1
2
0
5
10
15
Household Income

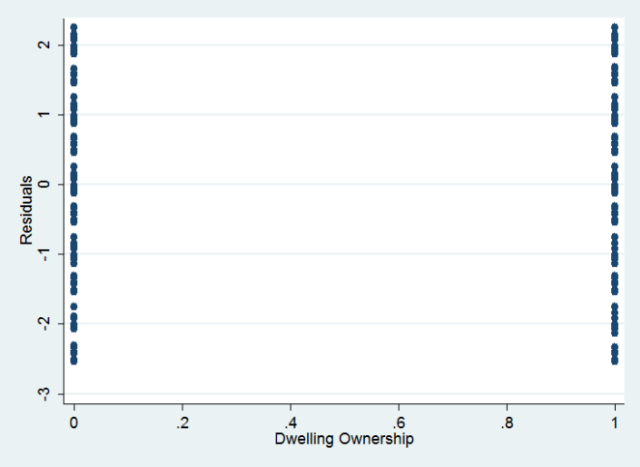
F.3: Scatterplots of Self Reported Health residuals against values of Independent Variables

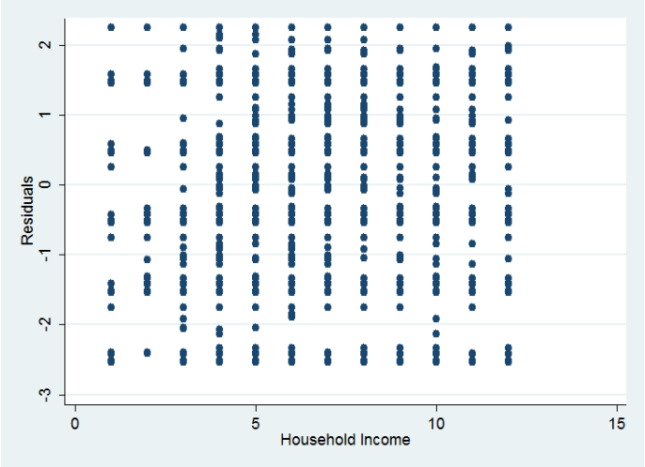



Residuals
-3
-2
-1
0
1
2
0
20
40
60
80
RangeofPrestigeScores

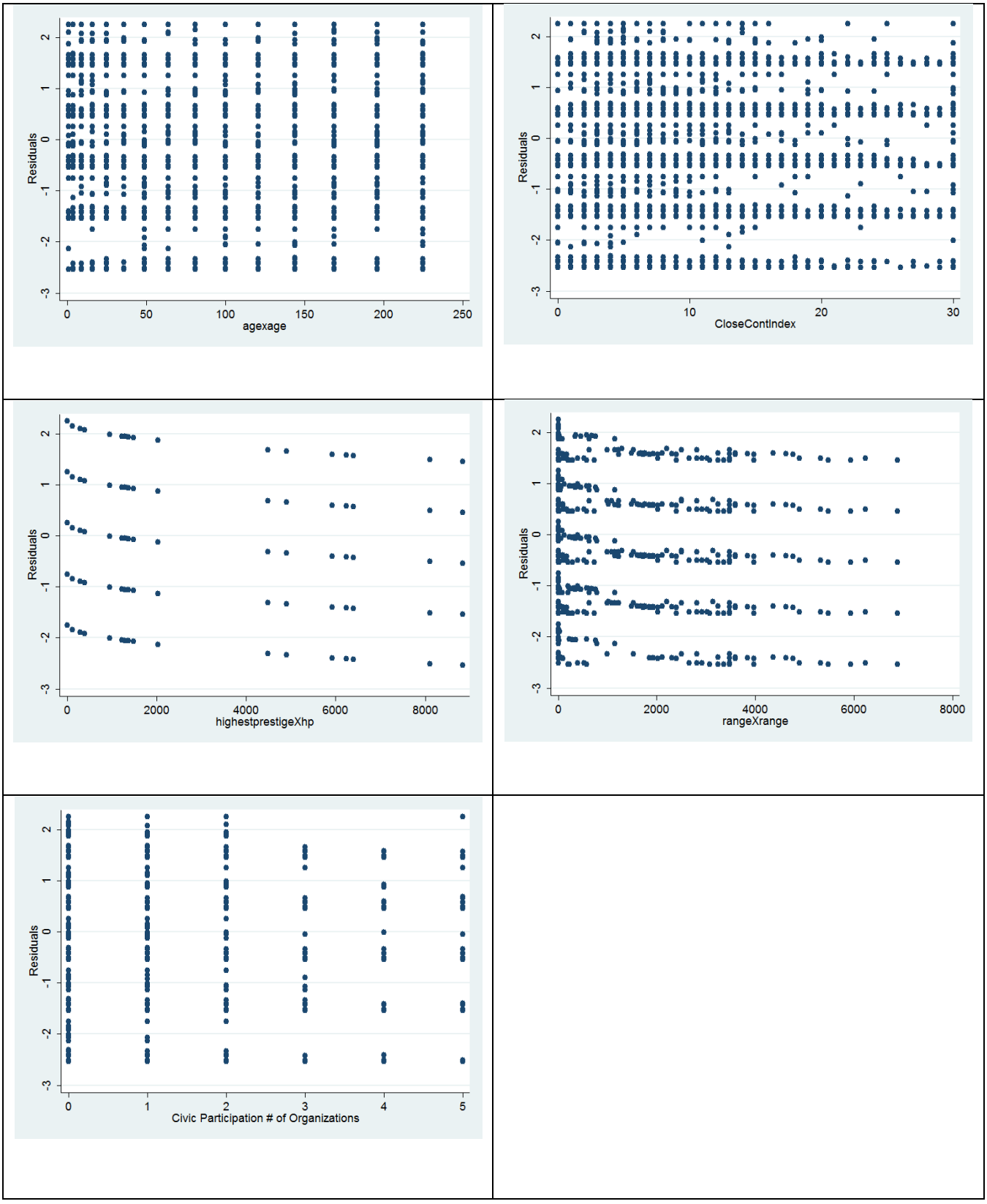

Residuals
-3
-2
-1
0
1
2
0
5
10
15
20
25
Civic Participation # of Organizations


Residuals
-3
-2
-1
0
1
2
1
2
3
4
5
How Often Participated in Organizations

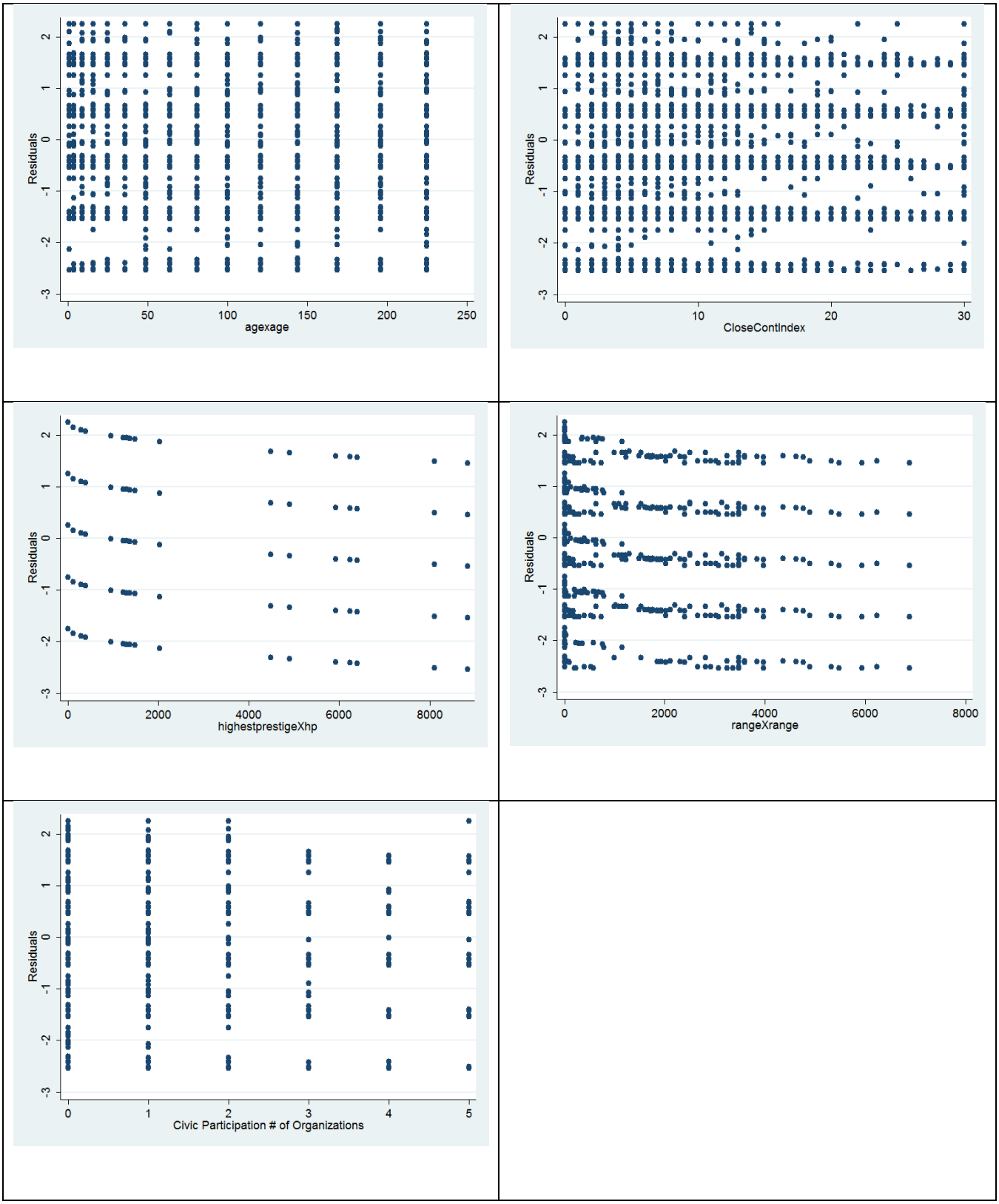

Residuals
-3
-2
-1
0
1
2
0
.2
.4
.6
.8
1
Dwelling Ownership


Residuals
-3
-2
-1
0
1
2
0
5
10
15
Household Income

F.4: Adjusted Scatterplots of Chronic Condition residuals against values of IV's



F.5: Adjusted Scatterplots of Activity Limitations residuals against values of IV's



F.6: Adjusted Scatterplots of Self Reported Health residuals against values of Independent Variables