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# Social Determinants of Mental Health and Well-Being among Aboriginal Peoples in Canada

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A thesis submitted in partial fulfillment of the requirements for the degree in Doctor of Philosophy

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SOCIAL DETERMINANTS OF MENTAL HEALTH AND WELL-BEING AMONG  
ABORIGINAL PEOPLES IN CANADA

(Spine title: Mental Health and Well-Being among Aboriginal Peoples)

(Thesis format: Integrated Article)

by

Susan Wingert

Graduate Program in Sociology

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy

The School of Graduate and Postdoctoral Studies

The University of Western Ontario

London, Ontario, Canada

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THE UNIVERSITY OF WESTERN ONTARIO  
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Chair of the Thesis Examination Board

## ABSTRACT

The articles in this volume address the question: How do social determinants structure the health and well-being of the Aboriginal population in Canada? The first article uses bivariate statistical tests to assess whether First Nations residents' subjective assessments of personal and community well-being correspond to scores from the Community Well-Being (CWB) Index, which is a measure of socioeconomic conditions in the community. The second article uses path analysis to test the extent to which the stress process model explains the social distribution of psychological distress and well-being in the off reserve Aboriginal population. Specifically, it investigates whether stress, mastery, and social support mediate the pathways between social status and mental health outcomes. The results of these two chapters suggest that education is an important determinant of well-being. The final two chapters explore potential barriers to higher educational attainment. The third article uses multinomial logistic regression to assess whether intergenerational exposure to residential schools patterns educational attainment across three cohorts of First Nations adults. The fourth chapter uses churn theory to examine whether mobility patterns affect educational attainment among Aboriginal adolescents and young adults living off reserve.

Collectively, the articles presented here support the contention that the health and well-being of the Aboriginal population is tied to, although not solely determined by, their social and economic positions. CWB scores were significantly associated with residents' perceptions of their own and community's well-being. Stress, mastery, and social support are mediators between social status and mental health; however, it appears that specific

social statuses are more strongly associated with specific mediators. In terms of educational attainment, there was no clear patterning based on intergenerational proximity or density of residential school exposure. The results suggest that exposure alone is a poor predictor. Patterns of migration were associated with educational attainment in both cohorts. Generally, it appears that frequent moves are associated with higher odds of dropping out or falling behind in high school. However, having never moved is associated with lower odds of attending post-secondary.

#### Keywords

Aboriginal, First Nations, mental health, distress, well-being, residential school, educational attainment, migration, stress process model, churn theory

## CO-AUTHORSHIP

The chapters, *Well-Being in First Nations Communities: A Comparison of Objective and Subjective Dimensions and Churn Migration and Educational Attainment among Aboriginal Adolescents and Young Adults*, were published with Dan Beavon and Jerry White as co-authors. Dan Beavon provided data access and financial assistance through the Strategic Research and Analysis Branch of Indian and Northern Affairs Canada. Mr. Beavon and Dr. White provided feedback on earlier drafts of the chapters. All data analysis and writing were solely the work of Susan Wingert.

## DEDICATION

This thesis is dedicated to my parents, James and Linda Wingert, for telling me I could do anything.

To my husband, Leonard Minuk, for saying he would support me in anything I wanted to do.

And to my children, Alden and baby Bean, for reminding me why we strive to make the world a better place.

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## CHAPTER 1

### Introduction

The evidence from national surveys suggests that the health and well-being of the Aboriginal population in Canada has generally improved over time. However, disparities between the Aboriginal and non-Aboriginal populations endure. For example, between 1980 and 2000, life expectancy increased by eight years among First Nations males and 8.6 among First Nations females (Health Canada, 2005). Yet, despite these improvements, First Nations men and women have a life expectancy that is 8.1 and 5.5 years shorter than the Canadian average, respectively (Health Canada, 2005). In terms of self-rated measures, a much lower proportion of First Nations respondents living on reserve rated their health as very good or excellent (39.9%) compared to the general population (59.6%) based on 2003 data. On the other hand, 74.8% of First Nations living on reserve said they were mentally balanced all or most of the time, while 73.3% of respondents in the general population rated their mental health as very good or good (Health Canada, 2006). Projections based on the Registered Indian population estimated that gaps in life expectancy would remain in 2021 with a gap of 5.2 years among males and 3.8 years among females (Gour, 2003).

There are also disparities between identity groups that reflect differences in historical experiences that have shaped contemporary population profiles. Generally, Métis and non-Registered Indians fare better than Registered Indians and Inuit. Among Aboriginal people living off reserve, 56% said their health was very good or excellent in

2001, which was 9% lower than the population average. However, the gap was negligible among young people (O'Donnell & Tait, 2004). According to 2006 data, a slightly smaller percentage of Métis persons rated their health as very good or good compared to the general population (58% versus 62%). However, a similar or higher proportion of Métis adolescents and young adults rated their health as favourable compared to the population average for the same age group (Janz, Seto, & Turner, 2009). Among Inuit, about half reported that their health was very good or good, which was actually lower than in 2001 (Tait, 2008). Life expectancy is also about 15 years shorter than the population average and may have declined over the 1990s (Tait, 2008).

How can we understand disparities between and within groups? The persistence and pervasiveness of health inequalities by social status within and between nations has led researchers to theorize common root causes (Link & Phelan, 1995; Marmot, 2004; Wilkinson, 2005). These have been labelled social determinants of health, which are defined as:

The conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels, which are themselves influenced by policy choices. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries. (World Health Organization, 2010, p. 1)

The Public Health Agency of Canada (2010) lists 12 determinants of health: 1) income and social status; 2) social support networks; 3) education and literacy; 4) employment

and working conditions; 5) social environments; 6) physical environments; 7) personal health practices and coping skills; 8) healthy child development; 9) biology and genetic endowment; 10) health services; 11) gender; and 12) culture.

Among the social determinants of health, those relating to social stratification have been identified as fundamental causes of health inequalities because they distribute resources such as power, prestige, wealth, knowledge, and social connections. These resources are associated with a wide range of secondary determinants that, in turn, influence health. Those who at the upper end of the social gradient can leverage the resources at their disposal to create conditions that support health, avoid disease risk factors, and access preventative and curative health services (House, 2002; Link & Phelan, 1995). Among the determinants listed above, income and social status, education and literacy, employment and working conditions, and gender are primary determinants of health because they are associated with processes of social stratification. The others represent secondary determinants of health that link social status with health outcomes. For example, those who have better access to material resources can choose housing that meets their needs in a neighbourhood with health-enhancing features such as strong social support networks, recreation facilities, and low levels of ambient stressors.

Research has shown that Aboriginal populations are relatively disadvantaged in terms of health determinants. Health Canada's (2009) analysis of health determinants among First Nations found lower average levels of educational attainment, income, and labour force participation rates. In addition, in terms of physical environments, First Nations communities were more likely to have inadequate housing, water, and sanitation.

Available evidence on personal health practices suggests higher rates of non-ceremonial tobacco use, alcohol consumption, and obesity. Rates of routine health screening procedures were also lower compare to the Canadian average.

While indigenous concepts tend to emphasize “well-being”, rather than the related but narrower concept of “health” (RHS National Team, 2007), most research on Aboriginal peoples has used measures of physical health. Much less is known about well-being related to psychological health, spirituality, social relationships, and community contexts. For example, the Aboriginal Peoples Survey 2001 cycle included measures of self-rated health, access to traditional and mainstream health services and professionals, activity limitations and disabilities, and specific medical conditions (Statistics Canada, 2005). Only the Métis supplement included measures of depression and spirituality, while the Arctic supplement included community ties and wellness (Statistics Canada, 2003). The APS included measures of the availability of social support, which indicates the degree to which respondents could access various types of support. What is missing is whether these supports are accessed and the degree to which social support contributed to positive or negative outcomes (Richmond, 2008).

Developing a more holistic picture of Aboriginal well-being means exploring these dimensions. While the complexity of the concept of well-being prevents us from examining all dimensions and levels simultaneously, we can begin to construct a more complete picture by looking at various slices individually. The articles presented here delve into some of these other dimensions of well-being by exploring community and psychological well-being. The articles in this volume draw upon a social determinants

framework to connect social status at the individual and community levels with mediating mechanisms and health outcomes.

The first article, *Well-being in First Nations Communities: A Comparison of Objective and Subjective Dimensions*, examines whether socioeconomic-based indicators correspond to other dimensions of well-being at the community level. It analyzes whether the Community Well-being Index<sup>1</sup> (CWB), which is based on education, labour force participation, income, and housing at the community level, is associated with differences in residents' subjective assessments of the conditions in their own communities and their own well-being. While it is descriptive in nature, it provides evidence as to whether these factors are fundamental causes (Link & Phelan, 1995) of health and well-being in First Nations communities.

The reliance on averages to describe population characteristics can mask tremendous diversity. While some segments of the Aboriginal population experience significantly lower levels of well-being, others do as well or better than the national average. The question is: What distinguishes the advantaged from the disadvantaged? Who bears the burden of distress and disorder? Developing policies that target those at highest risk of poor outcomes is more efficacious than encompassing the population as a

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<sup>1</sup> The CWB grew out of research at The University of Western Ontario and Indian and Northern Affairs Canada beginning with the Community Capacity Index (White & Maxim, 2003), the Registered Indian Human Development Index (Beavon & Cooke, 2003; Cooke, 2008), and finally the Community Well-Being Index (Cooke, 2005; McHardy & O'Sullivan, 2004).

whole, including those who are doing relatively well. This information also suggests which mechanisms may be most effective in producing improvements.

The second article, *The Social Distribution of Distress and Well-Being in the Off reserve Aboriginal Population*, assesses how social status variables, including education and income, distribute distress and well-being within the Aboriginal population. It investigates whether stress, mastery, and social support mediate the pathways between social status and mental health.

Education emerges as one of the key social determinants of health and well-being. Not only is it a foundational component in socioeconomic status through its effect on labour force participation, occupation, and income, it is also associated with personal resources, such as mastery, that further empower people to act on their own or community's behalf in ways that improve life chances and choices. Currently, the average level of educational attainment within the Aboriginal population is lower than the general population (Indian and Northern Affairs Canada, 2008). For example, between 2001 and 2006, the gap between the Aboriginal and non-Aboriginal populations aged 25 to 64 with a university degree continued to widen (Indian and Northern Affairs Canada, 2008). Data suggest that Aboriginal educational attainment also lags behind other ethnic minority groups (Beavon & Guimond, 2006), many of whom also experience poor socioeconomic conditions, discrimination, language barriers, and cultural incompatibilities. The question then is: What circumstances are either unique to or more prevalent among Aboriginal peoples that account for these disparities? What policies might help close the educational gap? The final two papers examine two potential

barriers to higher educational attainment within the Aboriginal population. The third article investigates the legacy of residential schools. *Intergenerational Residential School Attendance and Educational Attainment among First Nations: A Cohort Analysis* explores whether intergenerational exposure to residential schools patterns educational attainment among different cohorts of First Nations adults. Understanding how the colonial past has shaped the present can help policy makers identify those most at risk of poor outcomes and develop policies that specifically address those needs.

The fourth article, *Churn Migration and Educational Attainment among Aboriginal Adolescents and Young Adults*, looks at the role of churn migration in the educational attainment of Aboriginal youth and young adults. It posits that frequent moves between communities break bonds of social capital that link people to each other, local resources, and institutions. As a consequence, communities may be less cohesive and prone to isolation and lack of engagement among residents. One consequence of these processes may be to weaken bonds between educational institutions, young people, and their families.

Given that the Aboriginal population is projected to grow by 46% between 2001 and 2021 (Steffler, 2008), investments that address disparities between the Aboriginal and non-Aboriginal populations will have a tremendous impact. Individuals who enjoy a high level of well-being are better positioned to fully participate in and make positive contributions to their families, communities, and governments.

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Running head: WELL-BEING IN FIRST NATIONS COMMUNITIES

## CHAPTER 2

Well-being in First Nations Communities: A Comparison of Objective and Subjective

Dimensions

Susan Wingert

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## Well-being in First Nations Communities: A Comparison of Objective and Subjective Dimensions

There is widespread recognition that Canada's Aboriginal population, particularly those living on reserve, has lower average levels of well-being, whether defined in terms of physical or mental health, standard of living, or quality of life (Health Canada, 2009). How to eliminate these disparities is a pressing question. Public policy itself is an important determinant of a society's well-being (Huppert & Baylis, 2004). In particular, there is evidence to suggest that public policy influences individuals through multiple channels (Helliwell, 2003). As a result, a policy may have a positive effect on well-being via one channel and a negative one via another, which can help to explain why expected outcomes are not always evident. Understanding these possible multiple outcomes can lead to the development of better policies. While much of the attention has focused on addressing problems within First Nations communities, public policy should promote well-being as opposed to merely addressing social problems.

Well-being is an elusive concept. What constitutes well-being and the mechanisms underlying it has generated substantial theoretical and empirical work, but little consensus. To date, definitions have been broad and abstract. In 2004, at the Royal Society Discussion Meeting, well-being was defined as "a positive and sustainable state that allows individuals, groups or nations to thrive and flourish" (Huppert, Baylis, & Keverne, 2004, p. 1331). Despite these fuzzy definitions, this line of research has begun to shed light on how well-being is produced.

One approach to the study of well-being has been the development of composite indicators (Cooke, 2005). Since well-being is not directly measurable, researchers have combined key determinants of well-being that are shared across social groups (Dasgupta, 1999). This method enables researchers and policy makers to make comparisons across groups, locations, and over time. In particular, these indicators provide a way of evaluating policies and their alternatives (Dasgupta, 1999) in order to assess which policies have the greatest impacts on well-being among particular subgroups. Given the diversity among First Nations, it seems unlikely that one-size fits all approach is possible. Rather, we expect that policies may need to be targeted to specific group who face similar challenges to their well-being.

The analyses presented in this article assess the extent to which one such composite indicator of well-being, the Community Well-Being (CWB) Index, corresponds to residents own perceptions of the well-being of their First Nations communities and themselves. In particular, it examines if there are patterns in residents' responses depending on whether they live in a below average, average, or above average CWB community. The question addressed is whether measures based on socioeconomic determinants relate to other dimensions of well-being that are not directly measured by the indicator. Aboriginal peoples have been affected by many of the macro-level changes that have restructured labour markets, increased income inequality, and changed educational needs. As a result, there is a shared interest in creating a society that supports the well-being of its citizens; however, Aboriginal peoples may approach the issue from a different cultural and historical perspective (Abele, 2004).

## Literature Review

### *Community Well-Being Index*

The CWB provides a simple and understandable objective measure of basic socioeconomic dimensions of well-being, including education, labour force participation, income, and housing. These dimensions have been recognized as key non-medical determinants of health and well-being (First Nations Inuit Health Branch, 2005). In addition, many leaders in Aboriginal communities have stressed the importance of these issues.

The CWB has been used to compare conditions across First Nations, and between First Nations and non-First Nations communities (White & Maxim, 2007). Aboriginal organizations have used it as compelling evidence of the need for policy that addresses disparities in living conditions. For example, the Assembly of First Nations (AFN) developed the *Closing the Gap Reporting Framework* using the CWB and other indicators to track progress toward to the goal of eliminating disparities (Assembly of First Nations, 2006). However, there have been criticisms of the measure, which usually focus on additional dimensions that have been excluded. For example, the AFN has emphasized governance, economic partnerships, jobs for youth, language and culture, land claims, revenue sharing, building institutions, and the environment as key determinants of First Nations' well-being (Assembly of First Nations, 2006).

The absence of measures of the cultural dimension has specifically drawn criticism (Ten Fingers, 2005). There are several issues that make the inclusion of culture in indices difficult. First, there is no pan-Aboriginal culture. There is tremendous cultural

diversity across First Nations. In order to add a cultural dimension, researchers need to find a measure that is equally valid across different cultural groups. A second, and related challenge, is finding a way of quantifying culture that is still meaningful. Obviously, culture is best understood qualitatively, but indices require quantitative data. Language may be a good candidate since it is a primary vehicle for cultural transmission (First Nations Inuit Health Branch, 2005). Norris (1998) and Norris and MacCon (2003), for example, classified Aboriginal languages as extinct, near extinction, endangered, viable with a small population base, and viable with a large population base. This approach provides a way of quantifying a proxy measure of cultural vitality. However, language is only one aspect of cultural engagement and may not be a critical one (Norris, 1998). It may be possible to have a strong cultural connection without speaking a traditional language. An additional challenge, if we are interested in seeing how First Nations compare to other groups, is finding an equivalent measure of culture for those other groups. Finally, there is limited data available that would enable such intra- or inter-group comparisons (Cooke, 2005).

As data become available, it will be possible to see if culture adds sufficient explanatory power to justify its inclusion in the CWB. Qualitative research conducted by or in partnership with First Nations is drawing attention to local understandings of well-being and the processes that link culture and well-being (see for example Ten Fingers, 2005). It will be exciting to see, as both lines of research develop, whether they compliment or contradict one another. The reconciliation of these two different



perspectives on well-being will likely bring about important advancements in terms of theory, method, and knowledge.

### *Objective and Subjective Dimensions of Well-Being*

It is generally agreed that well-being has the following characteristics. First, it is more than the absence of negative outcomes (Diener, Suh, Lucas, & Smith, 1999; Huppert et al., 2004). Well-being implies a high level or large number of positive outcomes relative to negative ones. Second, it is multifaceted and includes psychological, physical, social, and economic states (Diener et al., 1999; Huppert et al., 2004). Third, processes that produce well-being take place at the individual, community, national, and international levels (Helliwell, 2003). Fourth, well-being has objective and subjective dimensions, which may not be concordant (Diener et al., 1999). Subjective dimensions of well-being are relative and influenced by culture (Diener et al., 1999; Oishi, Diener, Lucas, & Suh, 1999). In other words, to whom we compare ourselves influences how well we think we are and what is most salient to our assessments depends on what our culture tells us is important. Finally, well-being is produced through interaction between individual agency and structural and cultural constraints (Thoits, 2006). Individuals exercise personal agency in order to seek out opportunities to improve their well-being, avoid or mitigate situations that are deleterious, and cope with or compensate for negative circumstances beyond their control. However, individuals do not have carte blanche. Structured social relations make certain choices and actions difficult or impossible by differentially distributing stressors, resources, demands, obligations, expectations, etc.

There has been growing recognition that measures of objective conditions only provide part of the picture (Biswas-Diener, Diener, & Tamir, 2004; Kahn & Juster, 2002). Subjective well-being refers to an individual's own personal assessment (McBride, 2001). Existing research has demonstrated that the relationship between objective conditions and subjective evaluations of well-being is complex. Individuals interpret their own objective conditions and create their own subjective understandings and evaluations. Research has identified three distinct dimensions of subjective well-being: positive affect, negative affect, and life satisfaction (Biswas-Diener et al., 2004). Since the former two are reactive to short-term changes in external circumstances, most of the research in the field has focused on life satisfaction (Helliwell, 2003).

Well-being is related to, but not synonymous with, economic prosperity (Diener et al., 1999). Most studies find only a modest correlation between personal income, and various measures of subjective well-being (e.g., happiness, life satisfaction) (Diener & Biswas-Diener, 2002; Diener et al., 1999). When relative income norms increase, subjective well-being tends to decrease (McBride, 2001). Having a low personal income substantially increases the risk of negative outcomes such as unhappiness, distress, and disorder (Diener & Biswas-Diener, 2002). In addition, concentrated disadvantage in neighbourhoods is associated with a wide range of negative outcomes including higher mortality rates, poorer health, crime, accidental injury and suicide (Sampson, Morenoff, & Gannon-Rowley, 2002). On the other hand, there are strong positive correlations between national wealth and mean subjective well-being probably due to the indirect benefits of living in a wealthy nation (e.g., better infrastructure, clean drinking water,

government funded education) (Diener & Biswas-Diener, 2002; Diener et al., 1999). Helliwell (2003) called these spill-over effects. Research has also shown that meeting basic needs predicts subjective well-being across cultures; however, higher order goals vary by culture (Oishi et al., 1999). The relatively high rates of poverty in the Aboriginal population suggest that basic needs are not being met in many communities (Abele, 2004). Research has also found evidence of diminishing returns at both the individual and national levels; that is, increases in wealth have a larger effect on subjective well-being among low-income individuals and citizens of poor nations, but level off as wealth increases (Diener & Biswas-Diener, 2002).

There are small, but significant correlations between an individual's education level and subjective well-being (Diener et al., 1999; Witter, Okun, Stock, & Haring, 1984). Consistent with findings on income, the effects of education are stronger among individuals with low incomes and those living in poorer nations (Diener et al., 1999). Helliwell (2003) found a strong positive effect between the average level of education in a nation and life satisfaction. He concluded that, for the most part, education affects well-being indirectly through increases in "participation, health, perceived trust, and higher incomes" (p. 351). Indeed, part of the effect is due to overlap with income and occupation; however, education may have benefits beyond higher income and a better job. A study by Steverink, Westerhof, and Bode (2001) showed that physical decline, continuous personal growth, and social loss were particularly relevant to the subjective well-being of adults past middle age. Individuals with higher income and education, along with better self-rated health and lower levels of loneliness, reported less physical

decline and social loss and higher levels of continuous growth. In their analysis of distress in the off reserve Aboriginal population, Wingert and White (2006) found that individuals with higher levels of education had a stronger sense of mastery, which contributed to lower levels of distress. Individuals with high levels of mastery may be better able to create conditions that are beneficial for well-being. However, education may have a negative effect on subjective well-being when it leads to goals that cannot be achieved (Diener et al., 1999). For example, if an individual cannot translate higher education into tangible benefits, such as a high paying job that uses his/her skills, higher levels of distress may occur. This may be the case on reserves with limited economic opportunities.

Work or labour force participation has received less attention in the subjective well-being literature. Kahn and Juster (2002) stated:

Work is a source of income, which in turn determines housing, neighbourhood, and the many other aspects of life that are in some degree monetized. A person's employment demands a significant part of his or her time and energy. For most people it is also a source of friendships, and for many it provides a means of utilizing valued skills and abilities. For all these reasons, work (employment) ranks high among the determinants of overall life satisfaction. (pp. 634-635)

Research has shown a connection between unemployment and negative mental health outcomes (Avison, 2001). In addition to health, employment opportunities and income have been associated with neighbourhood stability, pessimism, viability, and social functioning (Christakopoulou, Dawson, & Gari, 2001).

Existing research suggests that many of the dimensions of community well-being that the CWB captures are associated with a wide range of outcomes that directly or indirectly affect the subjective well-being of individuals. The following sections evaluate to what extent the subjective assessments of residents in First Nations communities are patterned by the CWB score of their community.

## Method

### *Research Questions*

Three research questions will be addressed: 1) What do residents of First Nations communities identify as the top priorities for their communities and do they vary by across CWB levels? 2) Are there differences in residents' subjective assessments of their community according to CWB level? 3) Is there a relationship between community well-being, as measured by the CWB, and subjective dimensions of individual well-being? Correspondence with subjective data provides support for the CWB as a proxy measure of community well-being. Where there are discrepancies, we are challenged to find explanations that will advance our understandings about the interplay between external conditions and the assessments of individuals.

## *Data*

The analyses are based on two waves of a panel<sup>2</sup> telephone survey by EKOS Research Associates. Data were collected between February and June 2005. The sampling frame was derived by identifying postal codes from the ten provinces that were associated with Census Subdivisions (CSDs) that contained a reserve or Band office. This exhaustive list of postal codes was used to find telephone numbers from all telephone books from those areas. The sampling frame included 120,000 telephone numbers. Subsequently, some postal codes with very high rates of ineligibility were excluded during the first few days of data collection in wave one. Telephone numbers were selected at random.

Survey respondents met three eligibility criteria: 1) they were a member of an Indian band or First Nation; 2) aged 16 or older; and 3) resided on a reserve in Canada for at least part of the year preceding the survey. The response rate was 34% ( $N = 2,002$ ) for wave one and 32% ( $N = 2,206$ ) for wave two. Of the wave one respondents, 800 were re-interviewed in wave two in order to link the results from the two waves. Survey respondents were asked to name their First Nation community, which was matched to its

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<sup>2</sup> The term panel survey is used for brevity. The 800 respondents from wave one who were re-interviewed in wave two constitute a true panel design. The remaining respondents were part of a pseudopanel design in which cross-sectional samples were drawn at two different points in time (Maxim, 1999).

corresponding CWB score<sup>3</sup>. Some communities were not classified as First Nations communities according to Indian and Northern Affairs Canada (INAC) ( $n = 774$ ) or respondents did not provide the name of their community ( $n = 570$ ). These cases were excluded leaving a final sample of 2,065 individuals. There were 785 individuals who completed wave one only, 745 in wave two only, 513 in both waves, and 22 cases who were missing identifiers for which wave(s) they participated.

### *Data Analysis*

INAC used CSD or community level data from the Census of Canada to calculate CWB scores. The CWB is made up of four dimensions of well-being: education, labour force participation, income, and housing, which are weighted equally. There are two indicators for education: proportion of the population 15 and older which has at least grade nine, and proportion of the population aged 20 and older with at least high school. The former is a proxy measure for literacy and receives 2/3 weight while the remaining 1/3 is assigned to the latter measure. Labour force participation is also made up of two indicators: labour force participation rate in the week prior to the census for those aged 20 and over, and proportion of the total labour force over the age of 14 who were employed in the week before the Census. These two components were equally weighted. Income is measured by income per capita, which is calculated as total income divided by

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<sup>3</sup> CWB scores have been calculated by researchers at Indian and Northern Affairs Canada (INAC) and the University of Western Ontario (UWO) for all communities in Canada that were completely enumerated in the Census (McHardy & O'Sullivan, 2004).

total population<sup>4</sup>. Housing is measured using two indicators: housing quantity or proportion of the population living in dwellings with a maximum of one person per room, and housing quality or the proportion of the population reporting their dwelling did not need major repairs. Each indicator received equal weight. Each indicator score is calculated according to the formula:  $x \text{ index} = (x \text{ actual} - x \text{ minimum}) / (x \text{ maximum} - x \text{ minimum})$ . For the indicator of the labour force participation rate, the maximum was set at two standard deviations above the mean for the CSD. The maximum for income per capita was set at \$40,000 and the minimum was \$2,000 (Cooke, 2005). Theoretically, scores can range between 0 and 1.

In this dataset, the CWB scores ( $M = 0.62$ ,  $SD = 0.099$ ), which range between 0.42 and 0.90, were used to divide the sample into three groups. The “average” group had scores that were within one standard deviation above or below the mean ( $n = 1,310$ ). Scores that were more than one standard deviation below the mean were labelled “below average” ( $n = 482$ ) and more than one standard deviation above was “above average” ( $n = 273$ ).

Bivariate tests of significance were used to test if the CWB groups differ on sociodemographic characteristics, attitudes and opinions about their communities, and beliefs about themselves. In order to test the null hypothesis that the three CWB samples are from the same population, the Kruskal-Wallis test was used to compare the sum of

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<sup>4</sup> The raw income scores are converted using a log function to account for the diminishing marginal utility of income.



ranks for ordinal dependent variables. Tests were performed using the `kwallis2` package for Stata. In addition to the overall test of significance, the program also calculates post hoc tests for least significant difference (*LSD*) in mean ranks between each pair. The formula is:

$$\left| \frac{R_i}{n_i} - \frac{R_j}{n_j} \right| \geq t \times \sqrt{S^2 \left( \frac{N-1-T}{N-k} \right) \left( \frac{1}{n_i} + \frac{1}{n_j} \right)}$$

where  $R$  is the total of the ranks for each sample,  $t$  is the value from the  $t$  distribution for the significance level and  $N-k$  degrees of freedom,  $T$  is the Kruskal-Wallis test statistic, and  $S^2$  is the sample variance of the combined adjusted ranks (Bewick, Cheek, & Ball, 2004). For these comparisons, the Bonferroni method was used to adjust the two-tailed  $p$ -value for multiple comparisons ( $\alpha = 0.025/3 = 0.008$ ). For nominal level variables, the chi-squared test will be used to determine whether the conditional distributions on the response variable are independent. Where the null hypothesis of statistical independence between variables is rejected, adjusted residuals will be used to determine which cells deviate from independence.

Tests were conducted using unweighted<sup>5</sup> data since standard statistical packages require integer weights for these tests, which results in non-integer weight scores being rounded. Individuals whose weight scores are rounded down to zero become invisible to subsequent statistical procedures. In order to preserve these cases, unweighted data are

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<sup>5</sup> Weights for each wave were calculated by EKOS research based on age, gender, and region for the First Nations population living on reserve according to Statistics Canada figures.

analyzed. Unweighted and weighted frequencies for sociodemographic characteristics of the sample are presented in Appendix A and show little change in the distribution of respondents. Cases with missing data are excluded listwise for each dependent variable.

## Results

### *Descriptives*

Table 1 provides distribution of sociodemographic characteristics in the sample. Given the low response rate, these figures will be compared to Census data for the on reserve population in order to gage the potential for sample biases.

The median age of the sample was 30 to 35 years. Data from the 2006 Census show that 28.2% of the on reserve population over the age of 14 are between the ages of 15 and 24. A little more than half of the population (55.3%) are between the ages of 25 and 54. The 55 to 64 age group makes up 9.1% of the population, while 7.4% are over the age of 65 (Statistics Canada, 2008a). These figures are very close to those found in this sample.

The median level of education was secondary school graduate. When compared to 2006 Census data, it becomes apparent that this sample has an overrepresentation of university-educated respondents. Census data show that, among First Nations aged 25 to 64 living on reserve, 50% had less than secondary school, 15% were secondary school graduates, 31% had a certificate or diploma, and 4% were university graduates

Table 1

## Sample Frequencies across Sociodemographic Variables

	<i>n</i>	%
Age		
16 - 17	174	8.4
18 - 24	393	19.0
25 - 29	223	10.8
30 - 35	249	12.0
36 - 41	212	10.3
42 - 47	245	11.9
48 - 53	180	8.7
54 - 59	162	7.9
60 - 65	91	4.4
66+	121	5.9
Missing	15	0.7
Education		
< Grade 8	194	9.4
Some secondary	772	37.4
Secondary graduate	450	21.8
Diploma or certificate	263	12.7
Some university	124	6.0

	<i>n</i>	<i>%</i>
Bachelor degree	169	8.2
Graduate degree	71	3.4
Missing	22	1.1
Household income (in 1,000s)		
< 10	374	18.1
10 - 19	306	14.8
20 - 29	286	13.9
30 - 39	232	11.2
40 - 49	150	7.3
50 - 59	94	4.6
60+	186	9.0
Missing	437	21.2
Employment		
Self-employed	108	5.2
Full-time	621	30.1
Part-time	159	7.7
Seasonal or term	143	6.9
On leave	73	3.5
Unemployed	320	15.5
Out of labour market	234	11.3

	<i>n</i>	<i>%</i>
Student	245	11.9
Retired	128	6.2
Missing	34	1.7
First language		
English or French	1,011	49.0
Aboriginal	970	47.0
Missing	84	4.1
<i>N</i>	2,065	

(Statistics Canada, 2008c). In this sample, the percentages for respondents aged 25 to 65 ( $N = 1,350$ ) were 49.1%, 20.4%, 16.2%, and 16.0% respectively<sup>6</sup>.

The median household income was 20,000 to 29,000. Comparable data were not readily available. However, Hull (2006), using 2001 Census data, found that 40% of Registered Indians living on reserve had a family income of less than \$20,000. Given that family income is a more restrictive definition than household income, the proportions are comparable in this data with 32.9% having a household income of less than \$20,000. On the other hand, the overrepresentation of university-educated people, and the strong correlation between education and income, suggest there is reason to suspect some inflation in household income. It should also be noted that close to 1/5 of respondents did not provide a response to this question. A comparison to those with non-missing data on this variable revealed that those with missing data were younger ( $U = 9.99, p < 0.001$ ), had lower levels of education ( $U = 7.57, p < 0.001$ ), were less likely to be employed full-time ( $Z = -7.36, p < 0.001$ ), and more likely to be out of the labour market ( $Z = 2.99, p < 0.01$ ), a student ( $Z = 8.30, p < 0.001$ ), or retired ( $Z = 2.02, p < 0.05$ )  $\chi^2(8, N = 2,065) = 117.95, p < 0.001$ . These characteristics suggest those with missing data would be in the lower income categories. However, it should be noted that more than half ( $n = 232$ ) with

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<sup>6</sup> The some university category has been excluded since it was not provided in the Census data. There is insufficient information in the data set to know if these respondents have high school only or have a diploma or certificate in order to reclassify them.

missing data on household income are under the age of 25, which means they may be living at home with parents or other relatives who provide income to the household.

Among different types of labour force participation, the modal category was full-time employment. The 2006 Census showed that 51.9% of First Nations aged 25 to 64 living on reserve were employed in the week prior to the Census (Statistics Canada, 2008b). In this data, 51.9% aged 25 to 65 were self-employed or working part-time or full-time. An additional 9.1% were engaged in seasonal or term work; these individuals may not have been counted under the Census definition since they may not have been working the week prior to the survey.

The distribution for first language was split almost in half. There were slightly more cases in the English or French than in the Aboriginal language category. In the 2006 Census, 51% of First Nations living on reserve reported being able to carry on a conversation in an Aboriginal language (Statistics Canada, 2008a). Data from the 2001 Census show that 44.4% of Registered Indians living on reserve learned an Aboriginal language alone or in combination with English or French as their mother tongue (Health Canada, 2009). These data appear to be comparable to Census findings.

### *Tests of Group Differences*

*Sociodemographic and cultural characteristics.* Table 2 presents the results for sociodemographic comparisons. There were significant differences between the CWB groups on all sociodemographic variables. The post hoc comparisons between groups for age, education, and household income showed that the mean ranks were significantly different between each CWB pair (Table 3). Those in higher CWB groups tend to be

Table 2

## Differences between CWB Groups on Sociodemographic and Cultural Characteristics

	<i>n</i>	Mean Rank	Test Statistic	<i>df</i>
<b>Age</b>				
Below	480	905.00		
Average	1302	1,024.03		
Above	268	1,248.46		
Overall	2,050		$H = 58.80^{***}$	2
<b>Education</b>				
Below	481	864.77		
Average	1292	1,036.08		
Above	270	1,234.74		
Overall	2,043		$H = 75.17^{***}$	2
<b>Household income</b>				
Below	365	733.18		
Average	1036	805.73		
Above	227	985.27		
Overall	1,628		$H = 42.49^{***}$	2
<b>Employment</b>				
Overall	2,031		$\chi^2 = 77.39^{***}$	16



	<i>n</i>	Mean Rank	Test Statistic	<i>df</i>
Employment location				
Overall	651 <sup>a</sup>		$\chi^2 = 10.32^*$	4
First language				
Overall	1,981		$\chi^2 = 258.73^{***}$	2
Speak Aboriginal language				
Below	269	702.18		
Average	831	655.29		
Above	191	526.47		
Overall	1,291 <sup>b</sup>		$H = 63.05^{***}$	2
Read or write Aboriginal language				
Below	262	696.61		
Average	823	641.92		
Above	190	540.19		
Overall	1,275 <sup>b</sup>		$H = 32.79^{***}$	2
Participation cultural activities				
Overall	492 <sup>c</sup>		$\chi^2 = 3.62$	2
Discrimination				
Overall	1,215 <sup>d</sup>		$\chi^2 = 5.01$	2

*Note.* *H* values are adjusted for ties.

<sup>a</sup>  $N = 656$

<sup>b</sup>  $N = 1,298$

<sup>c</sup>  $N = 513$

<sup>d</sup>  $N = 1,258$

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

Table 3

## Post Hoc Comparisons Between CWB Groups on Sociodemographic and Cultural Characteristics

	Mean Rank Difference	Least Significant Difference <sup>a</sup>
<b>Age</b>		
Average - Below	119.03 <sup>***</sup>	75.67
Above - Below	343.45 <sup>***</sup>	108.06
Above - Average	224.43 <sup>***</sup>	95.05
<b>Education</b>		
Average - Below	171.30 <sup>***</sup>	75.43
Above - Below	369.97 <sup>***</sup>	107.39
Above - Average	198.67 <sup>***</sup>	94.50
<b>Household income</b>		
Average - Below	72.56 <sup>*</sup>	68.50
Above - Below	252.09 <sup>***</sup>	95.13
Above - Average	179.53 <sup>***</sup>	82.48
<b>Speak Aboriginal language</b>		
Average - Below	46.90	62.61
Above - Below	175.71 <sup>***</sup>	84.45
Above - Average	128.82 <sup>***</sup>	71.62
<b>Read or write Aboriginal language</b>		

	Mean Rank Difference	Least Significant Difference <sup>a</sup>
Average - Below	54.69	62.53
Above - Below	156.43 <sup>***</sup>	83.99
Above - Average	101.73 <sup>**</sup>	70.95

<sup>a</sup> The critical value above which the mean rank difference is statistically significant at  $\alpha = 0.05$  adjusted for a two-tailed test with Bonferroni correction ( $p = 0.025/3 = 0.008$ ).

\*  $p < 0.008$ . \*\*  $p < 0.001$ . \*\*\*  $p < 0.0001$ .

older, more highly educated, and have higher household incomes compared to those in lower CWB groups.

While it is widely recognized that the First Nations population is younger than the Canadian population by approximately 15 years according to 2006 Census data (Statistics Canada, 2008d), these findings suggest the age structure of First Nations communities corresponds to socioeconomic levels (Table 2). Population aging is generally attributed to low fertility and increasing life expectancy (Statistics Canada, 2008d). These data suggest that lower CWB communities have higher birth and mortality rates relative to average and above average communities. Migration patterns and, in the case of Registered Indians, ethnic mobility related to Bill C-31<sup>7</sup> appear to play lesser roles in population growth on reserve (Guimond, 2006). However, it may be that young people and adults with dependent children from wealthier communities are better equipped to leave their reserves in order to pursue educational or employment opportunities. An analysis of Aboriginal young people found that moving was associated with higher odds of post-secondary attendance among 20 to 24 year-olds (Beavon, Wingert, & White, 2009). Population demographic trends are not generally broken down according to the socioeconomic level of the community, but these results suggest that there are different patterns that warrant further investigation.

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<sup>7</sup> Bill C-31 or 1985 *Act to Amend the Indian Act* removed parts of the *Indian Act* that were deemed discriminatory, including the loss of Indian Status for women who married non-Status men. Those who were affected by these provisions could apply to have their status reinstated (Statistics Canada, 2008a).

Given that two components of the CWB are based on educational attainment, functional literacy (proportion of the community population over the age of 15 with at least a grade nine education) and high school plus (proportion of the community population aged 20 and over with at least a high school diploma) (McHardy & O'Sullivan, 2004), we would expect to find significant differences in respondents' educational attainment across CWB groupings if this sample is representative of the population at each community level. Indeed, the median level of education is significantly higher at each successive CWB level (Table 2). Post hoc tests confirm that there are significant differences in educational level between each pair of CWB groups (Table 3).

The CWB also uses a measure of per capita income in the community. Again, it is important to note that this is an expected outcome if the sample is representative of residents at each CWB level given that the CWB includes income measures. The analysis confirms that there are higher rank means for income in higher CWB communities (Table 2) and that the differences between each pair are significant (Table 3).

The CWB measure of labour force activity captures the rate of labour force participation and employment in the community. In both waves of the EKOS survey, respondents were asked whether they were self-employed, employed full-time, part-time, seasonally or in a term position, on leave (sick, disability, maternity, or parental), unemployed looking for work (i.e., unemployed), unemployed not looking for work (i.e., out of the labour market), a student, or retired. The chi-squared test confirms that there is a relationship between CWB group and type of employment (Table 2). Adjusted residuals

show that those in below average communities had a lower than expected frequency of self-employment ( $Z = -2.57, p < 0.01$ ) and retirement ( $Z = -3.80, p < 0.001$ ) and an overrepresentation of people who were unemployed ( $Z = 3.20, p < 0.001$ ). Respondents from average CWB communities were less likely to have a seasonal or term job ( $Z = -2.88, p < 0.01$ ). Those in above average communities had a higher than expected number of self-employed ( $Z = 2.23, p < 0.05$ ), part-time ( $Z = 2.16, p < 0.05$ ), seasonal or term ( $Z = 4.60, p < 0.001$ ), and retired persons ( $Z = 3.22, p < 0.001$ ). There was also a lower rate of being: 1) out of the labour market ( $Z = -2.48, p < 0.01$ ), 2) unemployed ( $Z = -2.25, p < 0.05$ ), or 3) a student ( $Z = -2.52, p < 0.01$ ). While not statistically significant, the adjusted residual for full-time employment in the above average CWB category was negative ( $Z = -1.34, p < 0.1$ ). It appears self-employment is an important source of income in above average communities. Differences in the age structure of these communities may explain some of the differences since employment patterns are age-graded.

In order to examine how age may affect employment structure, the sample was divided into three age categories: under 30, 30 to 59, and 60 plus. In addition, to avoid zero or small cell sizes employment was collapsed into three categories: employed (self, full, part, seasonal/term), not currently working (unemployed, out of the labour market, on leave), and student or retired. Chi-squared analyses show that among those under 30,  $\chi^2(4, N = 771) = 14.15 p < 0.01$ , those in below average communities have a higher than expected frequency of unemployment ( $Z = 3.64, p < 0.001$ ) and a lower than expected frequency of being a student ( $Z = -2.27, p < 0.05$ ). The relationship between CWB and employment was not significant among those aged 30 to 59 and 60 and over. The results

suggest that age structure does not fully explain the employment pattern by CWB. For example, below average communities have a lower median age. Therefore, we would expect a greater proportion of students since educational attainment is typically undertaken in adolescence and young adulthood; however, the opposite pattern emerges from these data.

In wave one, respondents who indicated that they were employed (self, full- or part-time, or seasonal/term) were asked whether they were employed on reserve, off reserve, or both. Table 2 presents the results, which confirm an association between CWB level and employment location. Adjusted residuals show that respondents in below average communities had higher than expected frequencies of employment on reserve ( $Z = 2.58, p < 0.01$ ) and lower numbers working off reserve ( $Z = -2.16, p < 0.05$ ). On the other hand, those in above average communities were significantly less likely to work on reserve ( $Z = -2.43, p < 0.01$ ). There is also a statistically significant relationship between the location and type of employment,  $\chi^2(6, N = 651) = 59.07, p < 0.001$ . Adjusted residual analysis shows that those who are self-employed are significantly less likely to work on reserve ( $Z = -3.72, p < 0.001$ ), but more likely to work both on and off reserve ( $Z = 7.32, p < 0.001$ ). Full-time employment occurred more often on reserve ( $Z = 2.79, p < 0.001$ ) and was less commonly combined with off reserve employment ( $Z = -4.65, p < 0.001$ ). It appears that reserves provide opportunities for full-time employment; however, having a larger proportion of residents working off reserve provides additional socioeconomic benefits to the community.



The EKOS survey also asked questions relating to connection to traditional Aboriginal culture. In waves 1 and 2 respondents were asked which language they first learned as a child and still understand. In order to ensure adequate cell sizes, responses were recoded into English or French, and Aboriginal languages. The results show an association between CWB and language (Table 2). Those in below average communities had a higher than expected frequency of speaking an Aboriginal language ( $Z = 12.54, p < 0.001$ ), whereas those in average ( $Z = 2.10, p < 0.05$ ) and above average ( $Z = 12.56, p < 0.001$ ) communities were much more likely to speak English or French.

In wave one, respondents were asked to rate on a four-point scale how important it was to keep, learn, or relearn to speak, and read or write, their Aboriginal language. Responses were coded so that higher scores reflect greater importance. Responses were significantly different between CWB groups with those in lower CWB categories having higher mean ranks (Table 2). The differences between pairs were significant for average versus above average, and below average versus above average, communities for both speaking and reading or writing (Table 3). These findings suggest that residents of above average communities see proficiency in traditional languages as less important compared to their lower CWB counterparts.

Panel respondents in wave two (i.e., those who participated in waves 1 and 2) were asked to respond yes or no whether they had participated in any traditional or cultural activities over the past 12 months (e.g., trapping, gathering, singing, dancing, drumming, storytelling, or other spiritual activities). The results by CWB were not statistically significant (Table 2).

Research has shown that experiencing discrimination or racism can be deleterious to well-being (Whitbeck, McMorris, Hoyt, Stubben, & LaFramboise, 2002). In wave two, respondents were asked whether they had experienced discrimination or racism in the past two years because of their Aboriginal heritage. In below average, average, and above average communities, 35.60%, 43.12%, and 40.24% of respondents reported experiencing discrimination respectively. The results were significant at the 0.10 alpha level with those in below average communities being less likely to report experiencing discrimination ( $Z = -2.23, p < 0.05$ ) and those in average communities being more likely to report it ( $Z = 2.02, p < 0.05$ ). McHardy and O'Sullivan (2004) examined average CWB scores by geographic zone classification (urban, rural, remote, and special access). Special access communities had the lowest average CWB score (.60), followed by rural (.65), remote (.68), and urban (.71). It may be that residents in low CWB communities experience less racism and discrimination because they have less contact with non-Aboriginal communities.

Based on the data available here, it appears there is a complex relationship between culture and CWB. With respect to first language, we may be seeing a spurious relationship because Cree, one of the most prevalent Aboriginal languages, is concentrated across the Prairie provinces, which also have a disproportionate number of below average CWB communities (McHardy & O'Sullivan, 2004). However, there may indeed be a relationship between first language and economic integration, which means those without proficiency in English or French may be more likely to experience economic disadvantage. It may also be that remoteness, which makes economic

integration more difficult, provides a hedge against cultural dilution from contact with the dominant culture. When we look at other dimensions of culture, we find no association between CWB and participation. This finding suggests that many people who do not speak their Aboriginal language nevertheless participate in other aspects of their culture. Indeed, there is no significant association between participating in Aboriginal cultural activities and speaking an Aboriginal language as a mother tongue,  $\chi^2(1, N = 481) = 0.69$ ,  $p = 0.41$ . In each language group, almost twice as many people had participated in a cultural activity compared to those who had not. Boldt (1993) asserted much of the cultural revitalization among Aboriginal peoples has been in an expressive-ritualistic form as opposed to reasserting traditional values and norms that are encoded in language. If language is indeed a vehicle for culture, traditional livelihoods may be an integral part of life in below average communities. However, respondents may not think of traditional ways of living as traditional activities, which may lead to underreporting. On the other hand, it is possible that there is a disconnection between language and cultural activities. It may be that communities with more resources are able to provide organized, large-scale, more formalized traditional activities for their residents. It may also be the case that, while the majority of residents in average and above average communities learn English or French first, some may subsequently acquire their traditional language and enjoy the benefits of bilingualism.

*Community priorities and assessments.* In wave one, respondents were asked what areas of their First Nations community most urgently needed attention to improve the lives of residents. They were not read a list of choices and could give up to three answers. Since

respondents could provide multiple answers, the variables were recoded so that responses within a particular category were included regardless of whether it was a first, second, or third choice. There were 32 categories of responses (frequencies are presented in Appendix B). These categories were combined in order to ensure adequate cell sizes. The following are the 13 categories with their constituent sub-categories in brackets: 1) economy and jobs (more or better jobs; strengthen economy or economic development; better standard of living or quality of life for community; reduce reliance on social assistance or welfare; job skills training); 2) housing (better housing); 3) addiction and suicide (decrease in alcohol and drug use; decrease gambling on reserve; suicide prevention); 4) education (better education); 5) health care (better health care services); 6) recreation (better recreation facilities and meeting spaces; more recreational activities to occupy youth; more recreational or community activities); 7) family and senior supports (better early childhood development or childcare; more or better community supports for seniors or elderly; family or parenting programs or supports); 8) safety (more or better police services; decrease in violence or gang activity); 9) social and counselling services (more or improved social services and programs available; counselling programs or community support programs); 10) infrastructure (better roads, sewers, and public buildings; better drinking water; improvements to central part of reserve or town site); 11) governance and funding (how well community is run; better or more accountable band council or community leadership; self-government; increase funding to reserves); 12) culture (more opportunities for cultural events or language); and 13) other (other; better role models for success; alleviating problems associated with isolation of

community). If respondents identified any one of the constituent variables as a priority, the response was coded as “yes”. If a respondent did not list any of the items, then it was coded as a “no”. The results are presented in Table 4 with the most frequently cited categories first<sup>8</sup>. It is noteworthy that categories relating to what is measured in the CWB, namely the economy and jobs, housing, and education are high on the priority list. However, the only significant relationship with CWB was for infrastructure with those in low CWB communities being more likely to say it was a priority ( $Z = 3.87, p < 0.001$ ). Health care and housing are significant at the 0.10 alpha level with those in below average communities being less likely to identify health care and those in above average communities being less likely to list housing as a priority. It appears that community priorities transcend socioeconomic levels, which suggests there are some priorities that are shared across First Nations.

Survey respondents in wave one were also asked what the Government of Canada’s priority for First Nations should be. Respondents were not read a list of choices and were asked to give one answer. EKOS coded 32 categories, including “other” (see Appendix B)<sup>9</sup>. In order to ensure adequate cell sizes, the responses were recoded into

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<sup>8</sup> Of the component variables, the most frequently cited were: 1) better housing ( $n = 277$ ); 2) decrease alcohol and drug use ( $n = 250$ ); 3) better education ( $n = 245$ ); and 4) more or better jobs ( $n = 231$ ).

<sup>9</sup> The most frequently cited responses were: 1) education ( $n = 190$ ); 2) health care ( $n = 170$ ); 3) housing and homelessness ( $n = 140$ ); and 4) alcohol and drugs ( $n = 59$ ).

Table 4

## Associations between CWB Groups on Community Priorities

	<i>n</i>	$\chi^2$	<i>df</i>
Areas in need of urgent improvement <sup>a</sup>			
Economy and jobs	278	0.22	2
Housing	277	4.76	2
Addictions and suicide	258	3.14	2
Education	245	0.90	2
Recreation	154	3.50	2
Health care	140	5.13	2
Family and senior supports	103	0.03	2
Safety	97	0.18	2
Social & counselling services	82	1.14	2
Infrastructure	79	15.76 <sup>***</sup>	2
Governance and funding	77	0.48	2
Culture	35	0.86	2
Other	84	2.74	2
Missing	235		
Government of Canada priority			
Community living conditions	199		
Education	190		

	<i>n</i>	$\chi^2$	<i>df</i>
Health and social services	189		
Legal issues	153		
Social and health issues	112		
Unemployment	64		
Economic issues	36		
Other	74		
Missing	281		
Overall		45.19 <sup>***</sup>	14

*Note.* *N* = 1,298.

<sup>a</sup> Multiple responses were permitted.

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

eight categories: 1) community living conditions (financial support and funding to First Nations communities; infrastructure, development, services and access to reserves; poverty; housing and homelessness; reduction in cost of living and prices of goods); 2) education (education); 3) health and social services (health care; social services); 4) legal issues (crime and justice; land claims; Aboriginal treaty rights; self government; racism and human rights; settling or resolving residential schools claims; current legislative issues); 5) social and health issues (youth; general focus on Aboriginal issues; alcohol and drugs; other Aboriginal health issues; family structure and violence; other social issues); 6) unemployment (unemployment); 7) economic issues (economy; taxes; trade); and 8) other (environment; Canadian unity; band governance; band government ethics and accountability; federal government ethics and accountability; preservation of aboriginal culture, traditional values, and language; other). The most commonly mentioned priorities were community living conditions, education, and health and social services (Table 4). Again, components measured by the CWB, particularly education and housing, ranked high. There was a statistically significant relationship between CWB and government priority responses (Table 4). Adjusted residuals show that respondents in below average communities were more likely to say that community living conditions were a priority ( $Z = 3.01, p < 0.01$ ) while those in above average communities were much less likely to say it was a priority ( $Z = -4.17, p < 0.001$ ). On the other hand, those in below average communities were less likely to cite legal issues as a priority ( $Z = -2.81, p < 0.01$ ) while those in above average communities were more likely ( $Z = 3.80, p < 0.001$ ).



The two sets of responses seem to suggest that respondents want the Federal Government of Canada to make First Nations issues that already fall under their jurisdiction, such as funding to reserves, education, health and social services, and legal matters, a higher priority. On the other hand, some items that were high on the list of community priorities were quite low as a government priority. For example, more or better jobs were a frequently cited community priority, but unemployment was fairly low as a government priority. It appears that respondents see the development of local economies and jobs as a community-led initiative. There was overlap between the two sets of priorities with respect to education, housing, and alcohol and drug use. It is also noteworthy that culture is less frequently cited as a priority for the community or government. It may be that people are satisfied with current opportunities for cultural participation. The previous findings on cultural participation suggest that opportunities are not tied to socioeconomic conditions in the community. It may also be that people would like to see more, but feel it is an aspect of community life over which the community has a high degree of control in initiating. It is also possible that there are simply more pressing issues even in communities with relatively high socioeconomic conditions.

The next set of analyses examined whether there were differences in respondents' subjective assessments of their communities across CWB levels. In other words, do residents' own opinions mirror the objective information from the CWB score? In wave one respondents were asked to rate on a five-point scale (1 = very bad and 5 = very good): education (kindergarten through grade 12), health care (amount and quality),

safety, housing (amount and quality), drinking water, infrastructure, public facilities, jobs, and emotional and social support in their community. In addition, they were asked to rate on a five-point scale (1 = no problem at all and 5 = a very big problem) how much of a problem family violence and drug and alcohol abuse were. In wave two, respondents were asked to rate the economy in their community (1 = very bad and 7 = very good).

There were no significant differences by CWB for education and public facilities. All other variables showed statistically significant differences according to CWB level (Table 5). For amount and quality of health care, amount and quality of housing, drinking water, infrastructure, and the economy, average ratings are higher in communities with higher CWB scores (Table 5). The differences between groups are significant for above average versus below average and above versus average communities (Table 6). For quality of housing the difference between average and below average communities was also significant. Emotional and social support ratings were significantly different between above average and average communities. Interestingly, average communities had the lowest mean safety rating followed by below average communities (Table 5) with differences between average and above average, and above and below average communities being significant (Table 6). Family violence was rated as a bigger problem in below average communities compared to average or above average ones. Average communities rated drugs and alcohol as a bigger problem than below or above average communities respectively (Table 5). The differences in mean ranks between above and below average, and above and average, communities were significant for both family violence and drugs and alcohol (Table 6). While the general pattern follows our

Table 5

## Differences in Assessment of Community by CWB Group

	<i>n</i>	Mean Rank	<i>H</i>
Education (K-12)			
Below	255	652.33	
Average	810	614.81	
Above	185	635.31	
Overall	1,250		2.38
Amount health care			
Below	259	611.43	
Average	822	618.40	
Above	188	740.07	
Overall	1,269		19.24***
Quality health care			
Below	259	611.43	
Average	822	618.40	
Above	188	740.07	
Overall	1,269		19.24***
Safety			
Below	253	633.41	
Average	822	608.08	

	<i>n</i>	Mean Rank	<i>H</i>
Above	191	743.04	
Overall	1,266		22.41***
Amount housing			
Below	254	615.04	
Average	829	618.50	
Above	189	744.29	
Overall	1,272		20.78***
Quality housing			
Below	257	542.16	
Average	829	625.09	
Above	188	822.54	
Overall	1,274		69.10***
Drinking water			
Below	257	564.33	
Average	828	612.72	
Above	191	850.05	
Overall	1,276		81.16***
Infrastructure			
Below	260	559.64	
Average	826	616.23	

	<i>n</i>	Mean Rank	<i>H</i>
Above	190	843.23	
Overall	1,276		77.35***
Public facilities			
Below	253	635.24	
Average	820	631.40	
Above	188	623.53	
Overall	1,261		0.12
Jobs			
Below	256	608.04	
Average	824	606.09	
Above	189	797.55	
Overall	1,269		46.96***
Emotional and social support			
Below	255	617.43	
Average	823	625.39	
Above	190	696.88	
Overall	1,268		7.23*
Family violence			
Below	131	328.73	
Average	396	324.81	

	<i>n</i>	Mean Rank	<i>H</i>
Above	102	259.26	
Overall	629 <sup>a</sup>		12.95 <sup>*</sup>
Drugs and alcohol			
Below	257	625.99	
Average	828	668.22	
Above	190	522.54	
Overall	1,275		29.66 <sup>***</sup>
Economy			
Below	305	603.93	
Average	774	605.43	
Above	166	739.96	
Overall	1,245 <sup>b</sup>		21.03 <sup>***</sup>
Say in how community run			
Below	132	316.36	
Average	424	326.62	
Above	94	333.31	
Overall	650 <sup>a</sup>		0.51
Get help needed			
Below	138	306.02	
Average	434	326.87	

	<i>n</i>	Mean Rank	<i>H</i>
Above	84	373.83	
Overall	656 <sup>a</sup>		7.11*
Community well run			
Below	257	562.90	
Average	822	633.27	
Above	192	745.53	
Overall	1,271		28.96***

*Note.* *H* values are corrected for ties. *df* = 2. *N* = 1,298 except where noted.

<sup>a</sup> This question was only asked of half of the respondents in wave one.

<sup>b</sup> Data are from wave two. *N* = 1,258.

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

Table 6

## Post Hoc Comparisons of Mean Rank Differences between CWB Groups on Assessment of Community

	Mean Rank Difference	Least Significant Difference <sup>a</sup>
Amount of health care		
Average – Below	6.97	62.52
Above – Below	128.64**	84.06
Above – Average	121.67***	70.93
Quality of health care		
Average – Below	6.97	62.52
Above – Below	128.64**	84.06
Above – Average	121.67***	70.93
Safety		
Average – Below	25.33	62.93
Above – Below	109.63**	83.90
Above - Average	134.97***	70.31
Amount housing		
Average – Below	3.47	63.07
Above – Below	129.25**	84.48
Above - Average	125.79***	70.88
Quality housing		
Average – Below	82.93**	62.88



	Mean Rank Difference	Least Significant Difference <sup>a</sup>
Above – Below	280.38 <sup>***</sup>	84.53
Above - Average	197.45 <sup>***</sup>	71.15
Drinking water		
Average – Below	48.39	62.99
Above – Below	285.72 <sup>***</sup>	84.28
Above - Average	237.33 <sup>***</sup>	70.81
Infrastructure		
Average – Below	56.59	62.73
Above – Below	283.59 <sup>***</sup>	84.20
Above - Average	227.00 <sup>***</sup>	70.98
Jobs		
Average – Below	1.95	62.78
Above – Below	189.51 <sup>***</sup>	84.14
Above - Average	191.46 <sup>***</sup>	70.76
Emotional and social support		
Average – Below	7.96	62.83
Above – Below	79.46	84.01
Above - Average	71.50 <sup>*</sup>	70.56
Family violence		
Average – Below	3.92	43.85

	Mean Rank Difference	Least Significant Difference <sup>a</sup>
Above – Below	69.47*	57.45
Above - Average	65.55**	48.31
Drugs and alcohol		
Average – Below	42.23	62.94
Above – Below	103.45*	84.34
Above - Average	145.68***	70.91
Economy		
Average – Below	1.50	58.19
Above – Below	136.03***	83.02
Above - Average	134.53***	73.62
Get help needed		
Average – Below	20.85	44.34
Above – Below	67.81*	62.79
Above - Average	46.95	54.08
Community well run		
Average – Below	70.37*	62.80
Above – Below	182.63***	83.82
Above – Average	112.26***	70.43

<sup>a</sup>The critical value above which the mean rank difference is statistically significant at  $\alpha = 0.05$  adjusted for a two-tailed test with Bonferroni correction.

\*  $p < 0.008$ . \*\*  $p < 0.001$ . \*\*\*  $p < 0.0001$ .

expectations with higher CWB communities having more favourable ratings, it is interesting that there are few significant differences in mean ranks between below and average communities. This finding may reflect the fact that respondents are comparing themselves to Canadian society in general, rather than other First Nations. If this is case, then residents of average communities may perceive that conditions in their communities fall below general standards of living even though they are better compared to some First Nations. We are also left to speculate whether residents in average communities provide lower ratings of safety and higher ratings of drug and alcohol problems because of genuine differences in prevalence (i.e., average communities have more crime, violence, and substance abuse compared to below average communities) or if those in average communities are more aware or critical of these issues.

On a five-point scale (1 = strongly disagree and 5 = strongly agree), respondents were asked to indicate their level of agreement to the statements: I have a say in how things are run in my community, I get the help I need in my community, and my community is well run. There were no significant differences in the perception that people had a say in how their community was run (Table 5). However, people in higher CWB communities had higher average ranks for the availability of help. The differences were significant between below and above average communities only (Table 6). Other research has found a positive relationship between individual level socioeconomic status and social support (Wingert & White, 2006). Perceptions of how well run the communities were also followed CWB levels (Table 5). The differences between each

pair of CWB levels were significant indicating that those in higher CWB communities have more positive perceptions than those in lower level communities (Table 6).

It is clear that even though the CWB does not directly measure many elements of community life, there are generally more positive assessments as we move up the CWB ladder.

*Assessments of personal well-being.* The third research question asks whether there is a relationship between CWB level and residents' assessments of their own personal well-being. In wave one, respondents were asked to rate their quality of life (1 = very bad and 5 = very good). In addition, they were asked how strongly they disagreed or agreed with the statements: I often feel sad and depressed; I can meet most of the challenges that come my way; I have a lot to be proud of; and I have control over what happens to me. Mean ranks for quality of life were significantly greater in higher CWB communities (Table 7) with significant differences between below and above average, and average and above average communities (Table 8). Those in lower CWB communities more strongly agreed that they felt sad or depressed (Table 7). Contrasts showed significant differences between all pairs of CWB groups (Table 8). There were no significant differences in ratings of one's ability to meet challenges. In addition, while the global test of group differences was significant for pride, none of the group comparison tests were significant at the more stringent alpha level. Those in higher CWB communities reported stronger agreement that they had control over things in their lives (Table 7) with significant differences between below and average, and below and above

Table 7

## Differences in Assessments of Personal Well-Being by CWB

	<i>n</i>	Mean Rank	<i>H</i>
Quality of life			
Below	257	599.14	
Average	828	629.69	
Above	189	723.86	
Overall <sup>a</sup>	1,274		14.79***
Sad and depressed			
Below	256	731.26	
Average	828	636.54	
Above	191	519.34	
Overall <sup>a</sup>	1,275		38.97***
Meet challenges			
Below	253	637.60	
Average	824	629.91	
Above	191	650.19	
Overall <sup>a</sup>	1,268		0.68
Pride			
Below	259	597.81	
Average	829	643.65	

	<i>n</i>	Mean Rank	<i>H</i>
Above	191	681.37	
Overall <sup>a</sup>	1,279		8.63*
Control			
Below	254	540.34	
Average	817	643.35	
Above	190	699.11	
Overall <sup>a</sup>	1,261		24.63***
Person of Worth			
Below	303	552.66	
Average	762	617.36	
Above	166	725.39	
Overall <sup>b</sup>	1,231		30.83***
Satisfied with self			
Below	305	579.07	
Average	762	623.53	
Above	166	656.71	
Overall <sup>b</sup>	1,233		6.91*
Good person			
Below	303	533.35	
Average	761	630.83	

	<i>n</i>	Mean Rank	<i>H</i>
Above	166	695.16	
Overall <sup>b</sup>	1,230		29.47***
Do things well			
Below	304	588.28	
Average	765	622.68	
Above	166	650.86	
Overall <sup>b</sup>	1,235		4.81
Life worthwhile			
Below	287	479.92	
Average	742	615.65	
Above	158	699.53	
Overall <sup>b</sup>	1,187		71.21***
No hope			
Below	300	689.47	
Average	762	601.09	
Above	165	536.38	
Overall <sup>b</sup>	1,227		29.57***

*Note.* *H* values are corrected for ties. *df*=2.

<sup>a</sup> *N* = 1,298

<sup>b</sup> *N* = 1,258

Table 8

Post Hoc Comparisons of Mean Rank Differences by CWB for Assessments of Personal Well-Being

	Mean Rank Differences	Least Significant Difference <sup>a</sup>
Quality of life		
Average – Below	30.55	62.89
Above – Below	124.72 <sup>**</sup>	84.40
Above - Average	94.17 <sup>**</sup>	71.00
Sad and depressed		
Average – Below	94.73 <sup>**</sup>	63.04
Above – Below	211.92 <sup>***</sup>	84.28
Above - Average	117.19 <sup>***</sup>	70.76
Pride		
Average – Below	45.84	62.94
Above – Below	83.57	84.34
Above - Average	37.72	70.97
Mastery		
Average – Below	103.00 <sup>***</sup>	62.63
Above – Below	158.76 <sup>***</sup>	83.62
Above - Average	55.76	70.22
Person of worth		
Average – Below	64.70 <sup>*</sup>	57.80



	Mean Rank Differences	Least Significant Difference <sup>a</sup>
Above – Below	172.73 <sup>***</sup>	82.18
Above - Average	108.03 <sup>**</sup>	72.90
Satisfied with self		
Average – Below	44.47	57.76
Above – Below	77.64	82.22
Above - Average	33.18	73.01
Good person		
Average – Below	97.48 <sup>***</sup>	57.77
Above – Below	161.80 <sup>***</sup>	82.12
Above - Average	64.33	72.85
Life worthwhile		
Average – Below	135.74 <sup>***</sup>	57.05
Above – Below	219.62 <sup>***</sup>	81.30
Above - Average	83.88 <sup>*</sup>	71.90
No hope		
Average – Below	88.38 <sup>**</sup>	57.82
Above – Below	153.09 <sup>***</sup>	82.22
Above - Average	64.71	72.84

<sup>1</sup> The critical value above which the mean rank difference is statistically significant at  $\alpha = 0.05$  adjusted for a two-tailed test with Bonferroni correction.

\*  $p < 0.008$ . \*\*  $p < 0.001$ . \*\*\*  $p < 0.0001$ .

average, communities (Table 8). Overall, the relationships are in the expected direction with better quality of life and well-being in higher CWB communities.

In wave two, respondents were asked on a five-point scale how strongly they agreed or disagreed that they were: a person of worth; satisfied with themselves; a good person; able to do things as well as most people; living a worthwhile life; and someone with no hope for the future. Those in higher CWB communities more strongly agreed, on average, that they were a person of worth (Table 7) with significant differences between each pair of CWB groups (Table 8). While the global test of group differences was significant for being satisfied with one's self, the group comparison tests were not significant.

Respondents in average and above average communities had higher average ratings of themselves as a good person compared to those in below average communities (Table 7). The differences between below and average, and below and above average, communities were significant (Table 8). There were no differences in perceptions of doing things well. However, those in higher CWB communities were more likely to see their lives as worthwhile (Table 7) with significant differences in ratings between each pair of groups (Table 8). Those in lower CWB communities agreed more strongly that they had no hope for the future (Table 7). The contrasts were significant for all pairs except average and above average communities (Table 8). Again, the general pattern fits with the expectation that higher CWB communities better support the well-being of residents.

Finally, differences in health status were assessed. Respondents in wave two were asked if they had a physical or mental condition that impaired their daily functioning. The percentages that reported having impairment were 28.32% in below average, 29.19% in average, and 33.54% in above average communities. The results were not statistically significant  $\chi^2(2, N = 1,207) = 1.50, p = 0.47$ . It may be that this measure of health is too narrowly defined to detect differences. Self-rated health may be a more sensitive measure. Functional impairment is also more common at older ages, which may explain why above average communities have the highest percentage.

#### Discussion and Future Research

This paper aimed to expand our knowledge of well-being in First Nations communities by looking at how subjective assessments relate to objective conditions. A central issue is whether the CWB taps into dimensions of well-being that community residents deem important or if it imposes a view that is markedly discrepant from local perspectives. Overall, the results suggest that perceptions about priorities for First Nations communities are shared across the community socioeconomic spectrum. Housing, education, and employment, all of which are components of the CWB, rank high on the list of priorities. This finding suggests that residents of First Nations communities see these variables as critical to the well-being of themselves and their communities. Certainly, sociological theory and research supports the contention that those in positions of socioeconomic advantage have greater access to resources through which to create conditions favourable to well-being and avoid or mitigate those that are

deleterious (see for example Pearlin, 1989; Phelan, Link, Diez-Roux, Kawachi, & Levin, 2004; Turner, Wheaton, & Lloyd, 1995).

Residents' assessments of the conditions in their communities and their own well-being generally followed the expected pattern. There were a few interesting exceptions. For example, residents of average communities had the lowest ratings of community safety and the highest ratings of drugs and alcohol as a community problem. We are left to speculate as to whether these reflect differences in prevalence or perception. The finding that the availability of emotional support and help follow the CWB affirms that social dimensions of community life are linked to socioeconomic conditions. The literature suggests that individuals' social networks and the capacity of those networks to provide support are structured by social statuses, including socioeconomic status (House, Landis, & Umberson, 1988). Wingert and White (2006) found that income, but not education, was significantly related to social support in a sample of Aboriginal people living off reserve. The results here show that measures of positive affect, negative affect, and life satisfaction differ by CWB level. The finding that mental health and psychological well-being are related to socioeconomic conditions is in line with a large body of research connecting socioeconomic conditions and psychological well-being (for review see Yu & Williams, 1999). The literature supports the contention that health and wealth are related (for review see Feinstein, 1993), but the results here were not significant. However, it is very likely that it would be significant if a less restrictive measure of health were used. While most literature examines personal, family, or household socioeconomic status, Robert (1998) found community-level effects on health

beyond personal or familial wealth. These results support the contention that the CWB corresponds to a range of individual outcomes that it does not directly measure.

Perhaps the most intriguing questions surround the relationship between CWB and culture. Aboriginal peoples have emphasized that their culture is central to their individual and collective well-being. There is widespread acceptance for the assertion that the history of cultural oppression and marginalization is a major contributing factor to present levels of inequality. Relatively few studies have examined the role of culture in the production of well-being, but studies examining mental health outcomes have found positive effects. For example, Whitbeck et al. (2002) found that, among American Indians living on reservation, engaging in traditional practices was protective against the deleterious effects of discrimination. Studies have reported lower levels of psychological distress among individuals who spend more time in the bush (Kirmayer, Boothroyd, Tanner, Adelson, & Robinson, 2000). The First Nations Regional Longitudinal Health Survey (RHS) found that cultural events were considered important by respondents regardless of age, gender, income, education, ability to speak or understand a First Nations language, and community size or isolation. However, most felt that recent attempts to revitalize First Nations cultural practices, traditions, and languages had little impact (RHS National Team, 2007). However, in this survey, culture ranked very low on the list of community priorities. Again, there is no way of knowing why fewer respondents cited it as a priority. The context in which cultural activities occur may also matter. The positive effect of culture may be offset by the negative effect of socioeconomic deprivation. For example, the relatively high rates of Aboriginal

languages as mother tongue in below average communities do not seem to translate into positive self-perceptions and affect, or life satisfaction. As Kirmayer, Brass, and Tait (2000) argued, “attempts to recover power and maintain cultural traditions must contend with the political, economic, and cultural realities of consumer capitalism, technocratic control, and globalization” (p. 616). It may be that the highest levels of well-being are found in communities with high levels of both socioeconomic status and traditional culture. While language is a relatively straightforward indicator in terms of measurement, these analyses suggest it corresponds poorly with other dimensions of cultural participation. Multiple indicators, such as language and participation, may better capture levels of cultural engagement in the community. The increase in use of restorative justice and community sentencing for criminal offences may also necessitate a distinction between voluntary and court mandated participation.

Research has demonstrated that well-being is the product of a dense causal web of objective and subjective factors, many of which are interrelated. Sociological theory, research, and these analyses support the contention that socioeconomic variables play an important role in the production of well-being. Future research can examine how the dynamics among these factors and outcomes indicative of well-being are structured by community socioeconomic conditions. It can also examine the reciprocal relations between these factors. For example, education, labour force participation, income, and housing contribute to well-being and, in turn, individuals and communities with higher levels of well-being are better situated to create and take advantage of new opportunities in these and other areas. Do some structural constraints cross community socioeconomic

boundaries? Which ones are specific to particular CWB levels? Does higher education translate into benefits in terms of well-being in communities with limited economic opportunities? Is there a threshold in terms of CWB score above which there are diminishing returns on well-being? Are there costs associated with connection to Canadian society, such as exposure to discrimination and loss of traditional language? Do these offset the benefits of social and economic integration? What role do federal policies play in creating socioeconomic strata among First Nations?

Certainly, research examining the processes and mechanisms connecting objective and subjective well-being will undoubtedly uncover tremendous complexity. However, these analyses show definite patterning. Generally, residents in communities with better socioeconomic conditions were focused on community building, as opposed to meeting basic needs, and had more positive assessments of their communities, themselves, and their lives. These analyses support the contention that there is concordance between the CWB and other dimensions of well-being.

#### Limitations

The major limitation affecting these analyses is the low response rate. EKOS research noted that the response rate is comparable to other general public surveys (EKOS Research Associates, 2004). However, the 2001 Aboriginal Peoples' Survey (APS) achieved a response rate of 87.9% for the on-community portion of the survey (Statistics Canada, 2003). The results will be biased if those who did not participate are systematically different from those who did. While the frequencies for language were comparable to national data, those who were not fluent in English would have been

unable to complete the questionnaire. Without data on those who refused, it is difficult to accurately estimate whether there are differences between these two groups. Based on comparisons with Census data, there appears to be an overrepresentation of university-educated individuals. An additional issue is that members of the on reserve population without a telephone, who are likely the most disadvantaged members of the community, were excluded from the sampling frame. A systematic tendency for relatively disadvantaged members to be excluded due to sampling or nonsampling error may account for a lack of significant differences in many of the comparisons between below average and average communities. These results should be corroborated with those from other datasets, such as the APS. There were also cases that were excluded from these analyses because respondents did not provide the name of their community or it was not defined as a First Nations community by INAC. There were 704 cases that were excluded in wave one, 948 in wave two, and 287 from both waves. Where community-level analyses are desired, efforts should be made to address concerns about identifying one's community and ensuring that the communities sampled meet official criteria. However, given that most surveys exclude on reserve populations, and few design surveys specific to them, these data are important in spite of these limitations.



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## Appendix A

### Unweighted and Weighted Frequencies for Sample Sociodemographic Characteristics

	Wave 1				Wave 2			
	Unweighted		Weighted		Unweighted		Weighted	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age								
16 - 17	99	7.6	105	8.3	109	8.7	121	9.3
18 - 24	229	17.6	255	20.1	232	18.4	265	20.3
25 - 29	153	11.8	139	11.0	131	10.4	130	9.9
30 - 35	164	12.6	145	11.4	145	11.5	132	10.1
36 - 41	150	11.6	139	10.9	122	9.7	122	9.4
42 - 47	172	13.3	151	11.9	146	11.6	144	11.1
48 - 53	121	9.3	111	8.7	106	8.4	108	8.3
54 - 59	105	8.1	93	7.3	103	8.2	101	7.7

	Wave 1				Wave 2			
	Unweighted		Weighted		Unweighted		Weighted	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
60 - 65	57	4.4	53	4.2	62	4.9	66	5.1
66+	39	3.0	69	5.5	96	7.6	109	8.4
Missing	9	0.7	9	0.7	6	0.5	6	0.5
Education								
< Grade 8	105	8.1	106	8.4	123	9.8	116	8.9
Some secondary	486	37.4	504	39.8	454	36.1	492	37.7
Secondary graduate	278	21.4	269	21.2	281	22.3	293	22.5
Diploma or certificate	177	13.6	165	13.0	154	12.2	158	12.1
Some university	87	6.7	77	6.1	74	5.9	74	5.6



	Wave 1				Wave 2			
	Unweighted		Weighted		Unweighted		Weighted	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Bachelor degree	100	7.7	87	6.9	114	9.1	112	8.6
Graduate degree	50	3.9	43	3.4	44	3.5	44	3.4
Missing	15	1.2	16	1.3	14	1.1	16	1.3
Household income (in 1,000s)								
< 10	232	17.9	233	18.3	226	18.0	224	17.2
10 - 19	195	15.0	199	15.7	191	15.2	210	16.1
20 - 29	186	14.3	175	13.8	177	14.1	186	14.3
30 - 39	129	9.9	118	9.3	154	12.2	158	12.1
40 - 49	86	6.6	79	6.2	89	7.1	90	6.9
50 - 59	65	5.0	60	4.7	58	4.6	60	4.6

	Wave 1				Wave 2			
	Unweighted		Weighted		Unweighted		Weighted	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
60+	129	9.9	116	9.1	125	9.9	133	10.2
Missing	276	21.3	289	22.8	238	18.9	243	18.6
Employment								
Self-employed	70	5.4	69	5.4	61	4.8	70	5.4
Full-time	402	31.0	372	29.3	378	30.0	377	28.9
Part-time	100	7.7	96	7.6	93	7.4	102	7.8
Seasonal or term	84	6.5	73	5.8	95	7.6	100	7.7
On leave	141	10.9	134	10.5	148	11.8	135	10.4
Unemployed	207	15.9	204	16.1	186	14.8	198	15.2
Out of labour market	157	12.1	163	12.9	141	11.2	153	11.7

	Wave 1				Wave 2			
	Unweighted		Weighted		Unweighted		Weighted	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Student	73	5.6	95	7.5	87	6.9	98	7.5
Retired	50	3.9	47	3.7	44	3.5	43	3.3
Missing	14	1.1	15	1.2	25	2.0	28	2.1
First language								
English or French	650	50.1	627	49.5	620	49.3	670	51.4
Aboriginal	622	47.9	613	48.4	569	45.2	557	42.7
Missing	26	2.0	28	2.2	69	5.5	77	5.9
<i>N</i>	1,298		1,268		1,258		1,304	

## Appendix B

### Frequencies for Sub-Categories of Community Priority Variables

	<i>n</i>
<b>Areas in Urgent Need of Improvement<sup>a</sup></b>	
<b>Economy and jobs</b>	
More or better jobs	231
Strengthen economy or economic development	19
Better standard of living or quality of life for community	25
Reduce dependence on social assistance or welfare	12
Job skills training	6
<b>Housing</b>	
Better housing	277
<b>Addiction and suicide</b>	
Decrease in alcohol and drug use	250
Decrease gambling on reserve	8
Suicide prevention	6
<b>Education</b>	
Better education	245
<b>Recreation</b>	
Better recreation facilities and meeting spaces	127
More recreational activities to occupy youth	24

	<i>n</i>
More recreational or community activities	8
<b>Health care</b>	
Better health care services	140
<b>Family and senior supports</b>	
Better early childhood development or childcare	49
More or better community supports for seniors or elderly	29
Family or parenting programs or supports	28
<b>Safety</b>	
More or better police services	69
Decrease in violence or gang activity	28
<b>Social and counselling services</b>	
More or improved social services and programs available	45
Counselling programs or community support programs	38
<b>Infrastructure</b>	
Better roads, sewers, and public buildings	61
Better drinking water	21
Improvements to central part of reserve or town site	3
<b>Governance and funding</b>	
How well community is run	32

	<i>n</i>
Better or more accountable band council or community leadership	31
Self-government	8
Increase funding to reserves	8
<hr/>	
Culture	
More opportunities for cultural events or language	35
<hr/>	
Other	
Other	70
Better role models for success	9
Alleviating problems associated with isolation of community	5
<hr/>	
Government of Canada priorities	
<hr/>	
Community living conditions	
Financial support and funding to First Nations communities	8
Infrastructure, development, services and access to reserves	13
Poverty	32
Housing and homelessness	140
Reduction in cost of living and prices of goods	6
<hr/>	
Education	
Education	190

	<i>n</i>
<hr/>	
Health and social services	
Health care	170
Social services	19
<hr/>	
Legal issues	
Crime and justice	18
Land claims	44
Aboriginal treaty rights	41
Self government	27
Racism and human rights	16
Settling or resolving residential school claims	7
Current legislative issues	1
<hr/>	
Social and health issues	
Youth	30
General focus on Aboriginal issues	5
Alcohol and drugs	59
Other Aboriginal health issues	3
Family structure and violence	4
Other social issues	11
<hr/>	
Unemployment	
Unemployment	64
<hr/>	

	<i>n</i>
<hr/>	
Economic issues	
Economy	24
Taxes	10
Trade	2
<hr/>	
Other	
Environment	11
Canadian unity	1
Band governance	3
Band government ethics and accountability	8
Federal government ethics and accountability	4
Preservation of Aboriginal culture, traditional values, and language	11 35
Other	

<sup>a</sup>Total frequencies within each category may not add up to frequencies presented in table 4 because respondents who listed more than one of the sub-categories as a priority were only counted once in the overall category.



CHAPTER 3

The Social Distribution of Distress and Well-Being in the Off Reserve Aboriginal  
Population

Susan Wingert

The University of Western Ontario

## The Social Distribution of Distress and Well-Being in the Off Reserve Aboriginal Population

Epidemiological data suggest that Aboriginal peoples in Canada have higher rates of specific psychiatric disorders including depression (Tjepkema, 2002), alcohol and substance abuse, and suicide (Clarke, Colantonio, Rhodes, & Escobar, 2008; First Nations Inuit Health Branch, 2005). Yet, few studies look at non-disorder-specific measures of mental health and illness. There are important theoretical reasons to do so particularly when assessing the mental health consequences of social arrangements (Horwitz, 2002b). When specific disorders are considered, those who do not have the disorder in question, but have another disorder, are categorized in the no disorder group along with people with no mental illness (Aneshensel, 2005). These results can be misleading since research has shown that the specific way in which distress is manifest tends to follow social or cultural norms. For example, women are more likely to develop affective or anxiety disorders since these emotions are congruent with gender norms while men are more likely to abuse alcohol or other substances (Aneshensel, Rutter, & Lachenbruch, 1991). Cross-cultural research also suggests that distress is more likely to be expressed in culturally accepted ways. For example, somaticization<sup>10</sup> of distress is common in cultures with strong taboos against mental illness (Agbayani-Siewert, Takeuchi, & Pangan, 1999). Part of the complexity in studying Aboriginal populations is

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<sup>10</sup> Somaticization refers to the manifestation of psychological distress as physical symptoms.

that the term encompasses a large number of culturally distinct groups that have different traditional beliefs about mental health and illness. In addition, some Aboriginal people and communities have retained close ties to their traditional ways while others have, to varying degrees, adopted the norms of the dominant culture. Another limitation of disorder-specific measures is that those with sub-clinical symptom levels are indistinguishable from those with no symptoms. These measures create dichotomies out of what are theoretically continuous phenomena thereby losing important information about the distribution of symptomology (Horwitz, 2002b). As a result, the analysis underestimates the total burden of mental illness in the population (George, 1999) and may lead to the erroneous conclusion that a group has poorer mental health overall when they are simply more likely to manifest distress in ways that are commonly measured in population surveys (Aneshensel, 2005) and that meet the diagnostic criteria for specific disorders. Research has also typically focused on what causes mental illness, but not mental health (Horwitz, 2002b). Information about what contributes to positive health is equally valuable. Specifically, are mental health and illness two sides of the same coin or are they patterned in distinct ways? Most traditional definitions of mental health among Aboriginal peoples emphasize well-being, harmony, resilience, and the ability to pursue individual and collective goals (Kirmayer et al., 1994).

Within the field of Aboriginal mental health, most studies attribute mental health disparities to historical and contemporary colonialism. There are two avenues through which colonialism is seen as impacting Aboriginal peoples. The first is through social and economic disadvantage, while the second is cultural oppression and loss. Due to the

difficulties in defining, measuring, and comparing culture between and within groups, most comparative research has examined mental health disparities between Aboriginal and non-Aboriginal peoples. On the other hand, most research focussing on Aboriginal peoples has primarily examined issues related to culture, such as identity, assimilation, cultural loss or retention, cultural discontinuity, and cultural practices in healing (see for example Chandler & Lalonde, 1998; Herman-Stahl, Spencer, & Duncan, 2003; McCormick, 2000; Whitbeck, McMorris, Hoyt, Stubben, & LaFramboise, 2002). There has been much less attention paid to how the social structure distributes risk and protective factors and mental health outcomes within the Aboriginal population. This lack of attention to structural determinants of health may be due, in part, to the fact that the Aboriginal mental health literature has developed largely independently of the sociology of mental health. There is evidence that differences in social status are important determinants of mental health among Aboriginal peoples. Noh, Kaspar, and Schimmele (2003) examined the effect of demographic variables on mental health for a wide range of ethnic groups in Canada. They reported that when differences in sociodemographic and socioeconomic characteristics, health, social support, area of residence, and immigration status were controlled differences in rates of depression between Aboriginals and English ancestry whites were reduced to non-significant levels. However, no other studies have comprehensively measured important demographic characteristics in order to replicate these findings. In addition, no known studies have compared the effect of demographic variables on mental health among Aboriginal people. There are compelling reasons to do so. Chandler and Lalonde's (2002) analysis of First Nations youth suicide rates in British

Columbia has demonstrated dramatic variability by community; some had no suicides in the fifteen years in which data were collected while others had rates that were 800 times the Canadian average. This research suggests that not all Aboriginal people are at heightened risk of poor mental health. From a policy and service delivery standpoint, it is valuable to know which groups within the Aboriginal population are at greatest risk of negative mental health outcomes.

This paper contributes to the literature on Aboriginal mental health by using the stress process model (Pearlin, Menaghan, Lieberman, & Mullan, 1981), a prominent model in the sociology of mental health to examine the social distribution of psychological distress and well-being in the off reserve Aboriginal population. It also examines whether these outcomes are mediated or moderated by risk and protective factors, namely stress, mastery, and social support.

#### Theoretical Perspectives

While there are differences in cultural beliefs about mental health, Aboriginal peoples share a holistic approach that emphasizes mental, physical, emotional, and spiritual dimensions. In addition, they emphasize the role of the physical and social environment in which the person or community is situated in producing health or illness (Alfred, 2005; Smye & Mussell, 2001). This view is quite compatible with sociological perspectives which, unlike psychiatry and psychology, conceptualize mental health as being influenced by everyday life experiences, social arrangements, and contexts (Aneshensel & Phelan, 1999). Distress and disorder are seen as expectable consequences

of normative social arrangements that distribute hardships and resources inequitably (Aneshensel, 2005; Pearlin, 1999).

One of the most prominent models in the sociology of mental health is the stress process model. Pearlin and his colleagues theorized that the social structure and mental health outcomes were connected through stressors and social and psychosocial resources (Pearlin, 1999). The stress process model was developed to guide explorations of the pathways between the social structure, exposure to stressors and stress proliferation, mediating and moderating processes, and manifestations of stress (Pearlin, 1989; Pearlin et al., 1981). Pearlin (1995) described the major components of the model as:

Stressors, of course, refer to the problems, hardships, or threats that challenge the adaptive capacities of people; moderators are the social and personal resources that people can mobilize to contain, regulate, or otherwise ameliorate the effects of stressors; and outcomes refer to the effects of the stressors that are observed after the moderating resources are taken into account. In the background of the three components, and potentially influencing the nature of each of them, are the person's various social and economic characteristics. (p. 3)

What makes the model sociological in nature is that these components are theorized to be distributed according to the social structure (Pearlin, 1999).

Pearlin et al. (1981) identified two categories of stressors, discrete events and chronic or enduring life strains. Subsequently, other researchers have proposed other categories of stressors including daily hassles, traumas, stressful

non-events and ecological or contextual stressors (Wheaton, 1999). Research has supported the contention that differences in exposure to stressors accounts for a significant amount of social status variation in mental health outcomes (Turner, Wheaton, & Lloyd, 1995). For example, stress explained 23 to 50 percent of the differences in depression by sex, marital status, and occupation (Turner, Wheaton et al., 1995). Research over the past several decades has begun to illuminate what is stressful, to whom, in what context or under what conditions, and what causes stress to impact mental health (Thoits, 1995; Wheaton, 1999).

Mastery is one of the most widely studied social resources (Turner, Marino, & Rozell, 1995). “The construct of mastery refers to individuals’ understanding of their ability to control the forces that affect their lives” (Pearlin, 1999, p. 409). Mastery has been shown to be correlated with gender, age, race, marital status, education, income, occupation, employment status (Ross & Sastry, 1999; Thoits, 1995). Research suggests that mastery is related to social status because higher status groups experience objective conditions that make desirable outcomes more likely, which creates and reinforces feelings of personal control (Ross & Sastry, 1999).

While social support involves both objective (how much support is actually received) and subjective (how adequate the support received is) elements, most studies examine perceived social support (Turner, Marino et al., 1995). The literature supports the conclusion that there is an inverse relationship between social support and mental illness with most studies examining depression. Interestingly, social support is important

regardless of stress level, but effects are stronger under high stress conditions. Reliable relationships between gender, marital status, and socioeconomic status and social support have been reported in the literature. It also appears that having a supportive family in childhood lays the foundation for later social relationships (Turner & Turner, 1999).

### Mental Health of Aboriginal People

The limited epidemiological data available suggest that while most Aboriginal people are mentally healthy, a significant number experience distress or disorder. The majority of respondents in the 2002 to 2003 cycle of the First Nations Regional Longitudinal Health Survey (FNRHS) reported feeling in balance physically, emotionally, mentally, and spiritually. On the other hand, 30.1% reported feeling sad, blue, or depressed for two or more consecutive weeks, 30.9% had suicidal thoughts in their lifetime, and 15.8% had attempted suicide at least once (RHS National Team, 2007). Data from the 2001 Canadian Community Health Survey (CCHS) found that the rate of major depressive episode in the past year was 1.8 times higher in the Aboriginal population (13.2%) compared to the non-Aboriginal population. However, these rates were linked to socioeconomic status with non-significant differences between Aboriginal and non-Aboriginal people with high household incomes<sup>11</sup> (Tjepkema, 2002). There is also evidence that the consequences of mental illness are very serious. Measures of

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<sup>11</sup> The threshold for a high household income was set at \$30,000 for households with one or two people, \$40,000 for those with three or four people, and \$60,000 for those with five or more people.



potential years of life lost<sup>12</sup> due to mental disorders were much higher among First Nations (142 years per 100,000 population) compared to the Canadian population (60 years). Suicide accounted for 1,315.4 potential years of lost life among First Nations, which exceeded the rate for all cancers combined (First Nations Inuit Health Branch, 2005). In 1999, mental disorders accounted for 7.7 deaths per 100,000 among First Nations males and 5.5 among females. These rates exclude suicides, which had a rate of 12.4 among women and 43.3 among men. Suicide and self inflicted injuries are the leading cause of death among First Nations aged 10 to 44 (First Nations Inuit Health Branch, 2005). In the FNRHS, rates of suicide ideation and suicide attempts were highest among respondents aged 18 to 59 and lowest among those aged 60 and over (RHS National Team, 2007).

One of the few studies examining distress, rather than diagnosable disorder, found that among the Cree of James Bay distress in the past week was predicted by younger age, female gender, higher levels of education, living in an inland or isolated region, alcohol and drug use, less social support, having experienced significant life events, untimely loss of a close relative, and less time spent in the bush (Kirmayer et al., 2000). The off reserve Aboriginal population has been found to have a prevalence rate of high psychological distress that is 42% higher than white Canadians and two to five times the likelihood of having a severe mental disorder or substance dependence; however, the

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<sup>12</sup> Potential years of life lost is a measure of premature mortality compared to the population or subgroup average. The measure highlights causes of death that are prevalent among younger persons.

difference was non-significant among non-low-income groups (Caron & Liu, 2010). This finding suggests that socioeconomic status explains at least some of the disparity.

There are no known studies that have attempted to measure the stress universe among Aboriginal people. However, the literature suggests that many Aboriginal people experience significant levels of stress, particularly related to disadvantaged socioeconomic circumstances, historical and contemporary effects of colonialism, and the intergenerational transmission of trauma. Kirmayer et al. (2000) found that having a higher number of significant life events in the past year was associated with elevated rates of distress among Cree in James Bay. Similarly, research involving American Indian Elders in Michigan found that life events were related to increased risk of experiencing depression in the short-term (Chapleski, Kaczynski, Gerbi, & Lichtenberg, 2004). There is also some evidence suggesting greater exposure to traumatic events among indigenous peoples. A study with American Indians aged 15 to 57 living on two reservations showed relatively high lifetime rates of exposure to at least one trauma, particularly among women (Manson, Beals, Klein, & Croy, 2005). In a non-probability sample, respondents who reported childhood histories of abuse were more likely to use substances, report dysfunctional family relationships, and experience conflict in interpersonal relationships (Jacobs & Gill, 2002). American Indians who experienced childhood sexual abuse were significantly more likely to be diagnosed with multiple psychiatric disorders (Robin, Chester, Rasmussen, Jaranson, & Goldman, 1997). Research involving the Australian indigenous population have also found relatively high rates of stress and anxiety that have been linked to historical losses, being “trapped”

between cultures, and social and economic disadvantage (Brown, 2001). Whitbeck, Adams, Hoyt, and Chen (2004) found that American Indian adults often thought about historical losses and those thoughts were associated with anxiety and depression or anger and avoidance. Among the sources of stress experienced by Aboriginal peoples, racism is a commonly experienced one. In the FNRHS, two out of five First Nations respondents had experienced racism in the past year with those with higher levels of education and who work for pay to being more likely to have encountered it (RHS National Team, 2007). Perceived discrimination was found to be strongly associated with depressive symptoms among American Indian adults, while engaging in traditional practices was negatively associated (Whitbeck et al., 2002). There is also evidence that social problems are caused by and create stressors. For example, rates of family violence have been reported at 75% among Aboriginal women and 40% among children (Shah, 2004).

Few studies have examined the role of mastery in the production of health and well-being. In the FNRHS, suicide ideation was higher among those who received government transfers compared to those who did not (although rates in both groups were relatively high). The authors speculated that dependence on government aid may undermine one's sense of mastery (RHS National Team, 2007). Those who reported they had not experienced an episode of depression were more likely to indicate they strongly agreed on questions related to locus of control (RHS National Team, 2007). Others have suggested that the history of cultural genocide and colonial domination contributed to learned helplessness among Aboriginal peoples (Wesley-Esquimaux & Smolewski, 2004). Chandler and Lalonde's (2008) research on youth suicides in First Nations

communities found that community control over governance, land, and services was associated with very low rates of suicide.

Aboriginal peoples tend to share a collective orientation that places emphasis on relationships with family, friends, and community (First Nations Inuit Health Branch, 2009). Among various types of social support, about half of respondents in the FNRHS reported having access to tangible, informational, affective, and positive social interaction. However, levels of support were relatively low for the availability of someone to give the respondent a break from daily routines. Most people sought support from family and friends with family doctors, traditional healers, psychiatrists or psychologists, and crisis workers being used less frequently respectively (RHS National Team, 2007). Kirmayer et al. (2000) found that having fewer than five friends or close contacts was significantly associated with distress. Research has also found that Aboriginal women who reported high levels of positive social interaction, emotional and tangible support were more likely to be classified as thriving, which was defined as having excellent or very good self-rated health. Among Aboriginal men, only emotional support was significantly related to health status (Richmond, Ross, & Egeland, 2007). However, research also suggests that Aboriginal people, particularly those who experience socioeconomic disadvantage, may have reduced access to social support, live in communities where colonialism and poverty have undermined traditional values related to social ties, and have social networks that reinforce negative health behaviours (Richmond, 2008). Social support may be critical to those experiencing distress and

disorder. Among respondents in the FNRHS, those who were depressed used the supports available to them more than those who were not depressed (RHS National Team, 2007).

## Method

### *Research Questions*

These analyses examine how the stress process model explains the social distribution of distress and well-being in the off reserve Aboriginal population. The following research questions will be addressed: 1) Are psychological distress and well-being socially distributed by gender, age, family structure, household income, and education? 2) Are stress, mastery, and social support also socially distributed? 3) Do stress, mastery, and social support mediate the relationship between social status and distress or well-being? And 4) Do mastery and social support moderate the effect of stress on distress and well-being?

### *Data*

Data for these analyses come from the Canadian Community Health Survey (CCHS) cycle 1.2 Mental Health and Well-Being. Cycle 1.2 was a smaller-scale follow-up survey focused on mental health that provides provincial level results. The CCHS is a cross-sectional survey of individuals aged 15 and over living in private dwellings in the ten provinces. Excluded from the sampling frame were residents of the three territories, Indian Reserves, Crown Lands, and institutions, as well as full-time members of the armed forces and those in select remote communities. The sample was designed to provide reliable estimates at the provincial level and was stratified by urban and rural areas. Households were sampled using a multistage stratified cluster design. One person

aged 15 or older was randomly selected from each sampled household. The probability of selection within households was a function of household composition and designed to ensure an overrepresentation of respondents aged 15 to 24 and over 64. Data were collected by Statistics Canada between May and December of 2002. Responses were obtained from 36,984 individuals, which represent a combined household and person response rate of 77.0%.

### *Sample*

In the CCHS, 865 respondents (654.2 weighted cases) answered “yes” that their cultural or racial background included Aboriginal people of North America (North American Indian, Métis, Inuit/Eskimo)? (Statistics Canada, 2004). These cases were selected for the current analyses. There were no identifiers for identity group (i.e., First Nations, Métis, and Inuit) that would allow subgroup analyses.

### *Measures*

*Endogenous.* The non-specific measure of distress in the CCHS is the Kessler Psychological Distress Scale (K10). The scale is a composite index of 10 items. For each item, respondents indicate how often in the past month they have experienced each symptom (Statistics Canada, n.d.-b). Symptoms include feeling tired without a good reason, nervous, so nervous nothing calms the person down, hopeless, restless or fidgety, unable to sit still, sad or depressed, so depressed nothing would cheer the person up, everything is an effort, and worthless (Statistics Canada, 2004). Responses were coded from 0 or none of the time to 4 or all of the time. Distress scores range from 0 to 40 with higher scores indicating higher levels of distress (Statistics Canada, n.d.-b). Comparisons

of this scale with other mental health measures, including meeting diagnostic criteria for a range of mental disorders, using data from large population surveys have supported its validity as a measure of psychological distress (Andrews & Slade, 2001; Cairney, Veldhuizen, Wade, Kurdyak, & Streiner, 2007; Kessler et al., 2003).

The measure of well-being is the Psychological Well-being Manifestation Scale. The scale ranges from 0 to 100 with higher scores indicating higher levels of well-being (Statistics Canada, n.d.-b). The scale is composed of 25 sub-scales that measure the frequency in the past month a person: felt self-confidence, felt a sense of accomplishment or pride, took on lots of projects (was a “go-getter”), felt loved and appreciated, had goals and ambitions, felt like having fun, felt useful, smiled easily, was true to self, did a good job of listening to friends, was curious and interested, was able to clearly sort out complicated situations, found life exciting, felt life was well-balanced, was calm and level-headed, easily found answers to problems, got along well with others, lived at a normal pace, had the impression of really enjoying life, had a good sense of humour, was at peace with oneself, felt healthy and in good shape, able to face situations in a positive way, and had good morale (Statistics Canada, 2004).

Stress was measured using a five-point self-rated scale in response to the question, “Thinking about the amount of stress in your life, would you say most days are not at all stressful, not very stressful, a bit stressful, quite a bit stressful, or extremely stressful?” (Statistics Canada, 2004, p. 16). High scores reflect higher levels of stress.

The measure of mastery is a composite scale made up of two variables: self-perceived ability to handle unexpected problems and self-perceived ability to handle day-

to-day demands. Both scales were recoded so that high scores reflect higher levels of mastery. Cronbach's alpha was 0.7692.

The measures of social support in the CCHS were developed and tested for validity and reliability as part of the Medical Outcomes Study (MOS) Social Support Survey (Sherbourne & Stewart, 1991). There are four dimensions: tangible, social support, affection, positive social interaction, and emotional or informational based on 19 functional support items (Statistics Canada, n.d.-b). Tangible refers to having someone to provide material aid or assistance. Affection involves having someone with whom to give or receive love and affection. Positive social interaction measures the availability of others with whom to do fun or enjoyable activities. Informational refers to having others to provide advice, information, guidance, or feedback (Statistics Canada, n.d.-b). For each question, respondents were asked to rate how frequently in the past 12 months each type of support was available, ranging from never to almost always (Statistics Canada, 2004). The four subscales were standardized so each was given equal weight and summed. Cronbach's alpha was 0.9223. Responses were scored so that higher scores reflect higher levels of social support.

*Exogenous.* Five social status variables were included in the model. Gender was coded as male or female. Age was provided in years. Family structure was coded into four categories based on living or family arrangement, economic family status, marital status, and/or the presence of children in the household: single (not married or common-law with no children), couple (without children), single parent family, and two-parent family. Highest level of education completed was coded into three categories: less than



high school, high school or equivalent, or post-secondary. The income variable is based on total household income from all sources in dollars. Gender, family structure, and education were dummy coded with female, single, and less than high school as the reference category respectively.

### *Analyses*

Path analyses were used to test whether the stress process model was a good fit with the data and whether the variables were related as predicted by the model. An advantage of path analysis, compared to linear regression, is that it enables researchers to identify direct and indirect, and mediating and moderating, effects that help elucidate explanatory mechanisms (George, 1996). In accordance with Statistics Canada requirements, bootstrap survey weights<sup>13</sup> ( $N = 500$ ) were used in all data analyses. These

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<sup>13</sup> “The bootstrap re-sampling method used in the CCHS involves the selection of simple random samples known as replicates, and the calculation of the variation in the estimates from replicate to replicate. In each stratum, a simple random sample of  $(n-1)$  of the  $n$  clusters is selected with replacement to form a replicate. Note that since the selection is with replacement, a cluster may be chosen more than once. In each replicate, the survey weight for each record in the  $(n-1)$  selected clusters is recalculated. These weights are then post-stratified according to demographic information in the same way as the sampling design weights in order to obtain the final bootstrap weights” (Statistics Canada, n.d.-a, pp. 49-50).

weights allow the complex survey design to be taken into account when calculating variances. The analyses also make use of sample weights, which adjust the sample to reflect the population from which it was drawn (Statistics Canada, n.d.-a). The “svy” commands in Stata 10 (StataCorp, 2007) were used to produce descriptive statistics, missing cases analysis, some of the regression diagnostics, and correlation matrices.

Age, income, and distress showed sizable positive skew and had high coefficients of variation. In addition, regression models predicting well-being were significant on the Breusch-Pagan and Cook-Weisberg test for heteroskedasticity  $\chi^2(1) = 52.75, p < .001$ . These variables were transformed<sup>14</sup> to reduce non-normality and heteroskedasticity. Models with transformed and untransformed variables were compared and showed no significant differences in model fit  $\chi^2_d(1) = 1.24, p = .265$  for both distress and well-being models or interpretation of the parameters so the simpler, untransformed model was used (Tabachnick & Fidell, 2001). Examination of residuals showed only minor departures when untransformed variables were used. Collinearity diagnostics showed no evidence of multicollinearity among independent variables. An examination of univariate outliers showed there were five cases with high *Z*-scores on income and seven cases on distress. Tests for multivariate outliers showed nine cases on distress and five cases on well-being exceeded the critical value on Mahalanobis distance at  $p = .001$ . However,

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<sup>14</sup> A square-root transformation was used for age. Income and distress were transformed with a Box-Cox transformation. Well-being used a zero-skewness log transformation.

Cook's distance and the leverage statistic had maximum values of 0.070 and 0.289 for distress and 0.052 and 0.289 for well-being, which suggests that the outliers were not exerting a strong influence on the coefficients (Garson, 2010). Outliers were retained for the analyses.

Of the weighted cases, 515.8 (78.8%) had complete data and 138.4 (21.2%) were missing data on at least one variable. Missing case analyses showed that there were differences between those with missing and complete data in terms of age, family structure, education, income, stress, and well-being. Individuals with missing data on family structure had lower average levels of education  $F(1, 499) = 19.07, p < .001$ , incomes  $F(1, 499) = 6.54, p = .0109$ , and stress  $F(1, 499) = 5.85, p = .0159$ . Cases with missing data on income tended to be younger  $F(1, 499) = 10.58, p = .0012^{15}$ , have lower levels of education  $F(1, 499) = 4.21, p = .0408$ , and lower stress levels  $F(1, 499) = 9.82, p = .0018$ . Those missing data on mastery were on average older  $F(1, 499) = 5.71, p = .0172$  and had lower incomes  $F(1, 499) = 17.26, p < .001$ . Missing cases on social support were older  $F(1, 499) = 3.89, p = .0491$ , more likely to be single and less likely to be in a two-parent family  $F(2.62, 1308.29) = 4.00, p = .0106$ , and had lower average scores on well-being  $F(1, 499) = 4.85, p = .0282$ . Cases with missing data on well-being had lower incomes  $F(1, 499) = 25.14, p < .001$ .

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<sup>15</sup> Designed-based F statistic using a Rao and Scott second-order correction of Pearson chi-square statistic reported.

Data were imputed using the imputation by chained equations (ICE) package for Stata<sup>16</sup> (Royston, 2010), which uses the fully conditional specification (FCS) approach to multiple imputation. Assessments of FCS in comparison to multivariate normal imputation (MVNI) (Lee & Carlin, 2010) and joint modelling (JM) (van Buuren, 2007) have shown it to produce comparable results that are less biased than complete-cases approaches provided non-normality in continuous variables is addressed. The non-normal variables in these data were dealt with using prediction matching, “under which the missing value is replaced by the non-missing value for the case whose predictive mean is closest to that of the case with the missing value” (Lee & Carlin, 2010, p. 625). Five imputed data sets were created and analyzed using the mim package for Stata 10 (Galati, Royston, & Carlin, 2010).

Path analyses were conducted in Amos 17 (Arbuckle, 2008) using a survey weighted correlation matrix. In order to prevent failure of convergence during iterative estimation processes due to an ill-scaled covariance matrix (Kline, 2005), stress, mastery, social support and distress scores were divided by 10, well-being and age scores were divided by 100, and income was divided by 10,000. This procedure changes the mean and variance of the variable, but not its correlation with other variables (Kline, 2005).

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<sup>16</sup> ICE imputes using a series of univariate regressions with the other variables in the model as predictors. An advantage of this approach is that no assumptions about the variables having a multivariate normal distribution are made, which enables the imputation of categorical and continuous data. It also supports the use of survey weights (“Multiple imputation using ICE,” n.d.).

Monte Carlo parametric bootstrapping was used to provide additional estimates of parameters and standard errors. Differences between bootstrap and maximum likelihood estimates were very small so the maximum likelihood estimates are presented except where noted. Amos does not calculate significance tests for individual indirect effects when multiple indirect effects are present. The Sobel test was used to determine statistical significance of indirect pathways (Sobel, 1986). Figure 1 shows the path models used in the analyses. Gender, family structure, and education were entered as dummy variables, but have been presented as a block to simplify the diagram. Models for distress and well-being were run separately. An additional covariance pathway was added between gender and income in the model using imputed data. In order to test hypotheses about moderating effects between stress and mastery and stress and social support, interaction variables were created and added to the model after centering the variables to reduce collinearity.

## Results

Table 1 presents sample descriptives. While all respondents reported Aboriginal identity, about 60% reported having only Aboriginal identity while the remaining respondents indicated they belonged to at least one other ethnic group. There were slightly more females than males, which may reflect the greater representation of First Nations women with Registered Indian Status living off reserve (Cloutier et al., 2008) and longer life expectancy among Aboriginal women (Statistics Canada, 2010). The younger age of the Aboriginal population (Cloutier et al., 2008) are reflected in these data; over 2/3 are under the age of 45. Two-parent families were the most common

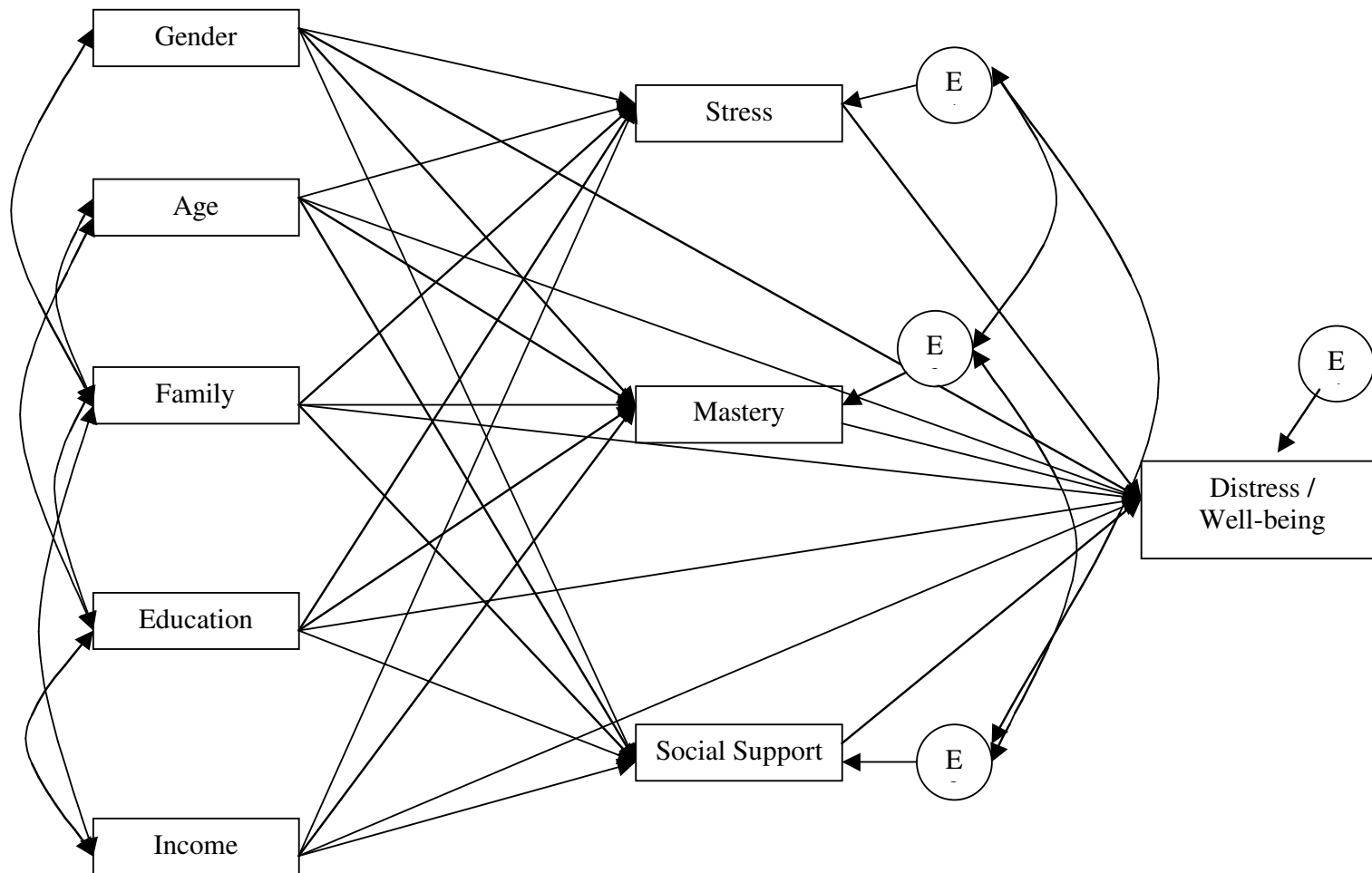


Figure 1. Path model: Distribution of stress, resources, and mental health outcomes by social status.

Table 1

## Survey Weighted Sample Descriptives

	Unimputed				Imputed			
	<i>n</i>	%	<i>M</i> ( <i>SE</i> )	<i>Median</i>	<i>n</i>	% <sup>1</sup>	<i>M</i> ( <i>SE</i> )	<i>Median</i>
Identity								
Single	398.2	60.86						
Multiple	256.1	39.14						
Gender								
Male	303.5	46.38						
Female	350.8	53.62						
Age								
			37.49 (0.66)					
15 - 24	147.7	22.58						
25 - 34	147.6	22.56						
35 - 44	159.6	24.40						*

	Unimputed				Imputed			
	<i>n</i>	%	<i>M</i> ( <i>SE</i> )	<i>Median</i>	<i>n</i>	% <sup>1</sup>	<i>M</i> ( <i>SE</i> )	<i>Median</i>
45 - 54	122.0	18.65						
55 - 65	50.4	7.71						
65+	26.8	4.10						
Family structure								
Single	143.2	21.89			144.8	22.14		
Couple	115.4	17.64			118.08	18.05		
Single parent	109.8	16.78			111.8	17.09		
Two parent	276.9	42.33			279.41	42.71		
Missing	8.9	1.36			-	-		
Education								
< High school	272.3	41.62			277.77	42.46		
High school	168.0	25.68		*	171.47	26.21		*



	Unimputed				Imputed			
	<i>n</i>	<i>%</i>	<i>M</i> ( <i>SE</i> )	<i>Median</i>	<i>n</i>	<i>%</i> <sup>1</sup>	<i>M</i> ( <i>SE</i> )	<i>Median</i>
Post-secondary	202.4	30.94			204.90	31.32		
Missing	11.5	1.76			-	-		
Income			45,002.51 (2,059.93)				42,718.30 (1,865.53)	
< 10,000	41.9	6.41			61.76	9.44		
10, 000 – 19,999	113.3	17.31			142.94	21.85		
20,000 – 29,999	71.0	10.85			89.10	13.62		
30,000 – 39,999	60.4	9.23		*	75.82	11.59		*
40,000 – 49,999	43.8	6.70			52.60	8.04		
50,000 – 59,999	58.8	8.99			64.18	9.81		
60,000 – 79,999	64.6	9.87			72.09	11.02		
80,000 +	87.2	13.33			95.64	14.62		
Missing	113.2	17.31			-	-		

	Unimputed				Imputed			
	<i>n</i>	%	<i>M</i> ( <i>SE</i> )	<i>Median</i>	<i>n</i>	% <sup>1</sup>	<i>M</i> ( <i>SE</i> )	<i>Median</i>
Stress			2.87 (0.05)					
Not at all	75.64	11.56						
Not very	134.3	20.52						
A bit	277.9	42.47		*				
Quite a bit	133.1	20.35						
Extremely	33.35	5.10						
Mastery			7.28 (0.08)				7.28 (0.08)	
Low	50.21	7.67			50.50	7.72		
Moderate	267.2	40.84			268.88	41.10		
High	334.4	51.12		*	334.82	51.18		*
Missing	2.36	0.36			-	-		
Social support			15.44				14.94	

	Unimputed				Imputed			
	<i>n</i>	%	<i>M</i> ( <i>SE</i> ) (0.13)	<i>Median</i>	<i>n</i>	% <sup>1</sup>	<i>M</i> ( <i>SE</i> ) (0.14)	<i>Median</i>
Low	16.7	2.55			25.78	3.94		
Moderate	97.52	14.91			232.50	35.54		
High	526.2	80.43		*	395.86	60.51		*
Missing	13.82	2.11			-	-		
Distress			7.09 (0.31)				7.08 (0.31)	
Low	543.7	83.11		*	545.80	83.43		*
Moderate	97.37	14.88			97.41	14.89		
High	10.98	1.68			11.00	1.68		
Missing	2.15	0.33			-	-		
Well-being			79.47 (0.74)				79.49 (0.74)	

	Unimputed				Imputed			
	<i>n</i>	%	<i>M</i> ( <i>SE</i> )	<i>Median</i>	<i>n</i>	% <sup>1</sup>	<i>M</i> ( <i>SE</i> )	<i>Median</i>
Low	9.95	1.52			9.94	1.52		
Moderate	129.0	19.72			129.73	19.83		
High	509.1	77.81		*	514.53	78.65		*
Missing	6.22	0.95			-	-		
Total <i>N</i>	654.2				654.2			

<sup>1</sup> Proportions are averaged across the five imputed data sets.

family structure, followed by single persons, couples, and single parents in both the unimputed and imputed data sets. The largest proportion of respondents had less than secondary school as their highest level of education, while approximately 30% had completed post-secondary schooling and a quarter had graduated from secondary school, which is similar to the proportions reported based on 2001 Census data (Mendelson, 2006). Based on imputed data, just under half of respondents had a household income that fell below \$30,00, which was the average income for an unattached individual in 2000 (Statistics Canada, 2003b). Approximately 30% had incomes between \$30,000 and \$59,999. While over a quarter had incomes above \$60,000 per year with a number of respondents among high earners households with incomes over \$100,000. Stress shows the expected pattern with most people reporting moderate levels. The vast majority of respondents indicated having moderate or high levels of mastery and social support. Similarly, the majority of respondents had low levels of distress and high levels of well-being.

Table 2 presents bivariate comparisons of the stress process components. Females had higher average levels of stress and distress while they also had lower levels of mastery and well-being compared to men. There was no gender difference in social support. Average stress levels were highest among adults in middle age (between 35 and 54) and lowest among seniors. Age differences in mastery were non-significant. Social support was highest among 15 to 24 year-olds and lowest among 35 to 44 year-olds. Higher social support among adolescents and young adults did not translate into lower distress since this age group had the highest average score. Adults aged 45 to 54 had the

Table 2

## Social Epidemiology of Stress Process Components

		Mean Values by Social Status				
	N	Stress	Mastery	Social support	Distress	Well-being
Gender						
Male	303.5	2.67 (0.08)	7.49 (0.10)	14.97 (0.26)	6.37 (0.40)	82.06 (0.92)
Female	350.8	3.04 (0.06)	7.10 (0.11)	14.98 (0.17)	7.71 (0.44)	77.22 (1.02)
Age	p <	0.001	0.01	n.s.	0.05	0.001
15 - 24	147.7	2.67 (0.08)	6.93 (0.19)	15.74 (0.27)	8.19 (0.48)	76.97 (1.35)
25 - 34	147.6	2.90 (0.09)	7.38 (0.12)	14.94 (0.31)	7.51 (0.62)	77.77 (1.52)
35 - 44	159.6	3.08 (.09)	7.33 (0.17)	14.28 (0.32)	7.74 (0.77)	78.85 (1.68)
45 - 54	122.0	3.06 (0.14)	7.52 (0.18)	14.88 (0.35)	5.05 (0.61)	82.88 (1.54)
55 - 65	50.4	2.63	7.31	15.42	6.26	83.57

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Mean Values by Social Status

	N	Stress (0.19)	Mastery (0.25)	Social support (0.34)	Distress (0.88)	Well-being (2.00)
65+	26.8	2.12 (0.16)	7.21 (0.34)	14.71 (0.70)	5.81 (1.07)	83.27 (2.46)
Family structure	p <	0.001	n.s.	0.05	0.01	0.01
Single	143.2	2.95 (0.11)	7.15 (0.15)	13.31 (0.33)	8.18 (0.71)	77.31 (1.63)
Couple	115.4	2.59 (0.12)	7.40 (0.19)	16.33 (0.21)	6.35 (0.74)	82.14 (1.61)
Single parent	109.8	3.11 (0.08)	7.05 (0.19)	13.48 (0.34)	8.89 (0.74)	74.00 (1.86)
Two parent	276.9	2.88 (0.07)	7.38 (0.12)	15.79 (0.22)	6.15 (0.47)	81.58 (1.12)
Missing	8.9					
Education	p <	0.01	n.s.	0.001	0.01	0.001
< High school	272.3	2.80 (0.10)	6.79 (0.11)	14.71 (0.26)	8.23 (0.50)	77.31 (1.21)

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Mean Values by Social Status

	N	Stress	Mastery	Social support	Distress	Well-being
High school	168.0	2.84 (0.08)	7.45 (0.18)	14.72 (0.28)	7.14 (0.60)	78.10 (1.44)
Post-secondary	202.4	3.00 (0.07)	7.83 (0.12)	15.62 (0.21)	5.48 (0.50)	83.21 (1.14)
Missing	11.5					
Income	p <	n.s.	0.001	0.01	0.001	0.001
< 10,000	41.9	2.82 (0.15)	6.95 (0.33)	13.06 (0.64)	9.00 (1.04)	75.58 (2.65)
10, 000 – 19,999	113.3	3.03 (0.10)	6.90 (0.20)	13.60 (0.39)	10.03 (0.82)	73.22 (2.08)
20,000 – 29,999	71.0	3.03 (0.14)	7.22 (0.18)	15.16 (0.50)	9.50 (1.18)	76.12 (2.37)
30,000 – 39,999	60.4	2.73 (0.11)	7.35 (0.21)	15.64 (0.35)	5.90 (0.63)	82.14 (1.51)
40,000 – 49,999	43.8	2.88 (0.13)	7.75 (0.25)	14.58 (0.53)	5.55 (0.87)	83.90 (2.23)
50,000 – 59,999	58.8	3.11	7.42	14.88	6.34	80.88



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Mean Values by Social Status						
	N	Stress (0.25)	Mastery (0.20)	Social support (0.64)	Distress (0.98)	Well-being (2.42)
60,000 – 79,999	64.6	2.75 (0.16)	7.22 (0.27)	15.99 (0.34)	4.62 (0.58)	81.42 (2.13)
80,000 +	87.2	2.92 (0.14)	7.97 (0.16)	16.07 (0.35)	4.07 (0.69)	86.32 (1.62)
Missing	113.2					
	p <	n.s.	0.001	0.001	0.001	0.001
Total sample	654.2	2.87 (0.05)	7.28 (0.08)	15.44 (0.13)	7.09 (0.31)	79.47 (0.74)

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lowest levels of distress. The picture for well-being was somewhat different with adults aged 55 and over having the highest scores. Results by family structure were distinctly patterned. Single parents and single persons had the highest average scores for stress and distress while couples and two-parent families had the highest scores on social support and well-being. Similarly, those with higher levels of education had higher mastery and well-being and lower distress. Those with post-secondary education reported higher levels of social support. Surprisingly, differences in stress level by household income were non-significant. The highest mastery and social support scores were found in the highest income category, while the lowest scores were in the lowest categories. The three highest average distress scores and lowest average well-being scores were among the lowest income groups.

*Distress.* Path analysis enables the calculation of total effects, which can be decomposed into direct and indirect effects. The total effect of all pathways, both direct and indirect, between each social status variable and distress are presented in Table 3. Compared to females, males had significantly lower levels of distress, but the difference was only significant using imputed data. The negative coefficient for age suggests that distress decreases with age. Among family structure variables, only two-parent families had significantly lower levels of distress compared to single persons. Similarly, there was no significant difference in distress levels between those with high school and those without, but those with post-secondary credentials had lower levels of distress compared to those without a high school diploma. Finally, higher incomes were associated with lower levels of distress.

Table 3

## Total Effect of Social Status Variables on Distress

	Unimputed	Imputed
Male	-0.003 (0.003)	-0.105* (0.049)
Female	<i>Ref.</i>	<i>Ref.</i>
Age	-0.692** (0.219)	-0.612** (0.196)
Single	<i>Ref.</i>	<i>Ref.</i>
Couple	-0.005 (0.004)	-0.096 (0.082)
Single parent	-0.001 (0.005)	-0.039 (0.095)
Two parent	-0.009* (0.004)	-0.165* (0.073)
< High school	<i>Ref.</i>	<i>Ref.</i>
High school	-0.003 (0.003)	-0.091 (0.062)
Post-secondary	-0.008* (0.003)	-0.169** (0.062)
Income	-0.265** (0.078)	-0.028** (0.007)
Model $\chi^2$ ( <i>df</i> )	9.620 (5) <i>p</i> = 0.087	5.585 (4) <i>p</i> = 0.232
<i>CFI</i>	0.996	0.999
<i>RMSEA</i>	0.042 <i>p</i> = 0.563	0.025 <i>p</i> = 0.794

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	Unimputed	Imputed
<i>GFI</i>	0.997	0.999

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*Note.* Unstandardized regression coefficients with standard errors in parentheses.

Standard errors generated using bootstrap method.

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

Figures 2 and 3 show the statistically significant direct paths, which test the hypotheses about the social distribution of mediators and distress, as well as the relationships between mediators and distress (see Appendix A for the complete table of results). Compared to females, males had significantly lower levels of stress, but there were no significant differences in social support and distress. The gender effect on mastery was significant using imputed data only. There was a significant negative relationship between age and distress, but only the effect of social support with imputed data was significant among the mediating variables. When family structures are compared, couples have lower stress and higher social support in relation to single persons. Unexpectedly, couples had significantly higher levels of distress with the imputed data. There were no significant differences between single persons and single parents. Two-parent families had significantly higher levels of social support compared to single persons. Among educational groups, those with high school or post-secondary had significantly higher levels of mastery compared to high school non-graduates. Income was positively related to stress, mastery, and social support, and negatively related to distress. The paths from the mediating variables, stress, mastery, and social support, were all significant with stress being positively related and mastery and social support being negatively related to distress. Table 4 shows the indirect or mediating effects of stress, mastery, and social support. Males have significantly lower levels of stress, which has the effect of lowering their distress levels compared to females. In the imputed data, the effect of mastery was also significant, which suggests that males have higher levels of

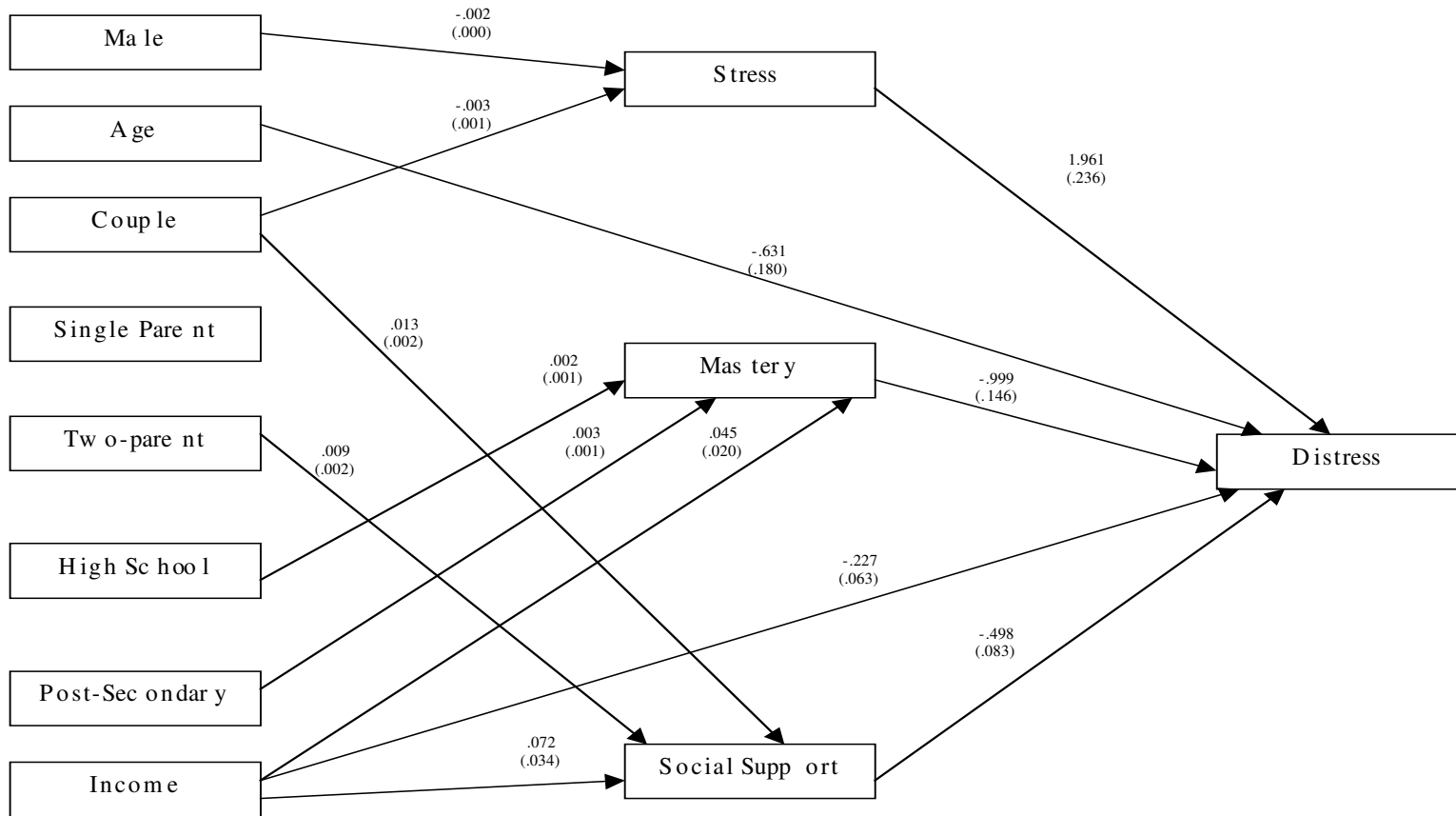


Figure 2. Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and distress based on unimputed model

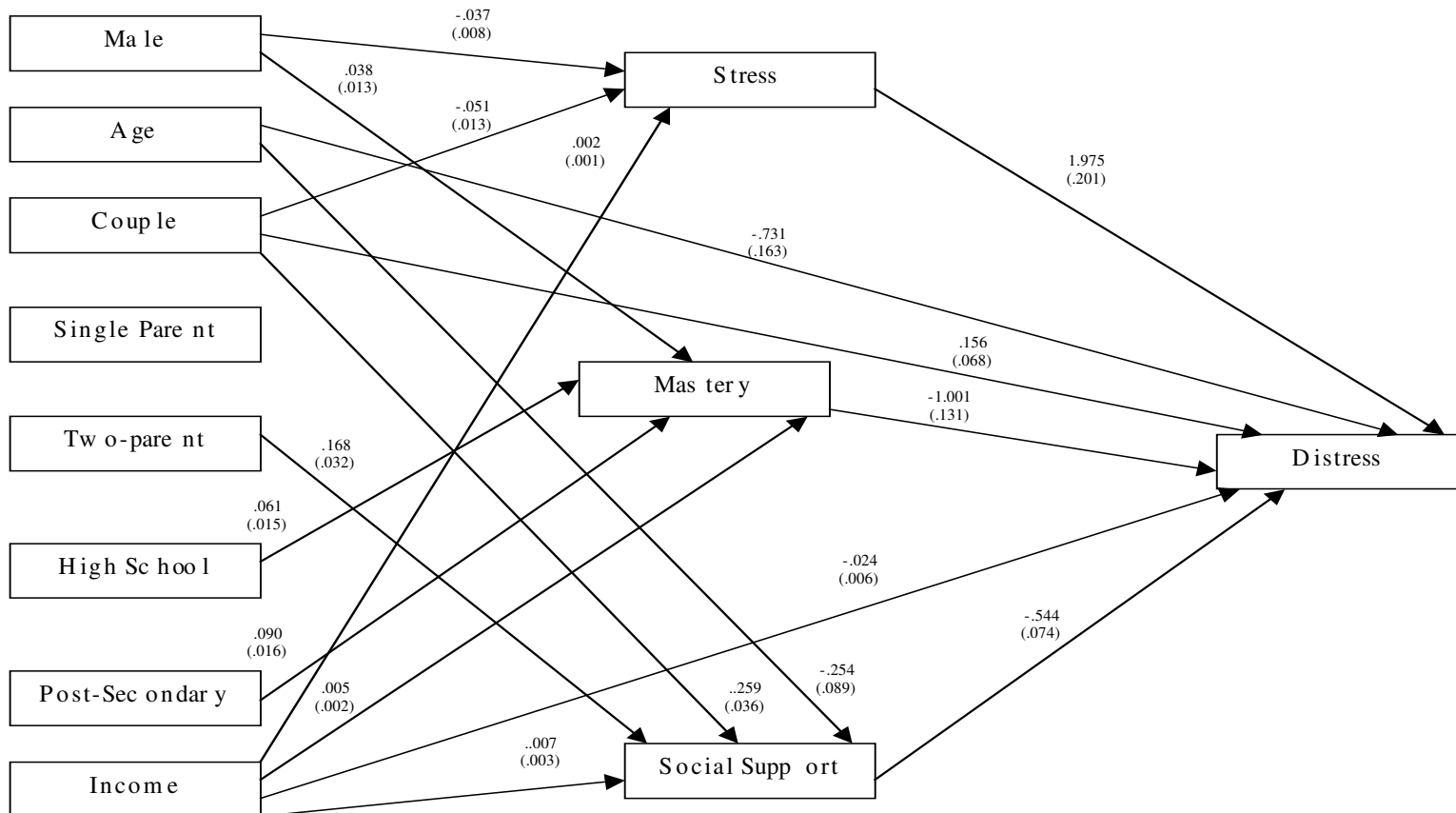


Figure 3. Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and distress based on imputed model.

Table 4

## Indirect Effects of Social Statuses on Distress via Mediators

	Unimputed				Imputed			
	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect
Male	-0.0039 <sup>***</sup> (0.0004)	-0.0010 (0.0010)	0.0005 (0.0005)	-0.004 <sup>***</sup> (0.002)	-0.0731 <sup>***</sup> (0.0175)	-0.0380 <sup>**</sup> (0.0139)	0.0060 (0.0120)	-.105 <sup>***</sup> (0.030)
Female	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Age	-0.0451 (0.0688)	-0.0639 (0.0577)	0.0483 (0.0500)	-0.061 (0.125)	0.0237 (0.0652)	-0.0430 (0.0514)	0.1382 <sup>**</sup> (0.0519)	.119 (0.117)
Single	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Couple	-0.0059 <sup>**</sup> (0.0021)	-0.0010 (0.0010)	-.0.0065 <sup>***</sup> (0.0015)	-0.012 <sup>**</sup> (0.003)	-0.1007 <sup>***</sup> (0.0276)	-0.0100 (0.0211)	-.1409 <sup>***</sup> (0.0274)	-.252 <sup>**</sup> (0.052)
Single parent	0.000 (0.0020)	0.000 (0.0010)	0.000 (0.0010)	0.001 (0.003)	0.0178 (0.0317)	-0.0110 (0.0251)	0.0071 (0.0240)	0.013 (0.057)
Two parent	-0.0020 (0.0020)	0.000 (0.0010)	-.0.0045 <sup>***</sup> (0.0012)	-0.007 <sup>**</sup> (0.002)	-0.0356 (0.0240)	-0.0060 (0.0180)	-0.0914 <sup>***</sup> (0.0214)	-0.133 <sup>**</sup> (0.044)



	Unimputed				Imputed			
	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect
< High school	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
High school	0.000 (0.0020)	-0.0020 (0.0010)	0.0005 (0.0005)	-0.002 (0.002)	0.0079 (0.0198)	-0.0611*** (0.0170)	0.0016 (0.0147)	-0.052 (0.035)
Post-secondary	0.0020*** (0.0002)	-0.0030** (0.0011)	-0.0010 (0.0005)	-0.003* (0.002)	0.0356 (0.0201)	-0.0901*** (0.0199)	-0.0234 (0.0150)	-0.077* (0.039)
Income	0.0431 (0.02410)	-0.0450* (0.0210)	-0.03586* (0.0180)	-0.039 (0.044)	0.0040* (0.0020)	-0.0050* (0.0021)	-0.0038* (0.0017)	-0.004 (0.004)

*Note.* Unstandardized regression coefficients with standard errors in parentheses. Coefficients calculated as  $ab = a \times b$  where  $a$  is the coefficient for the path from the social status variable to resource and  $b$  is the coefficient for the path from the resource to distress.

Standard errors calculated using the formula  $SE_{ab} = \sqrt{b^2 SE_a^2 + a^2 SE_b^2}$  where  $SE_a$  and  $SE_b$  are the standard errors for paths  $a$  and  $b$  respectively.

<sup>a</sup> Sum of all indirect pathways between social status variable and distress. Standard errors generated using bootstrap method.

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

mastery that in turn lowers distress. The total indirect effect of all three mediating variables collectively was also significant, which suggests that men have better access to resources that enable them to maintain lower levels of distress compared to women. With the exception of social support using imputed data, none of the indirect effects of age were significant. Among different family structures, couples had significantly lower levels of distress compared to single persons as a result of their lower stress levels and greater social support. There were no significant differences between single persons and single parents. Two-parent families had lower distress via their greater access to social support. The indirect effects between those with less than high school and high school were not significantly different with the exception of mastery with imputed data. However, those with post-secondary credentials had lower levels of distress due to higher levels of mastery. Using unimputed data, the effect via stress was also positive and significant, but the total mediating effect was negative suggesting comparatively low levels of distress. The effect of income was significantly negatively related to distress via both mastery and social support. There was also a significant positive effect via stress using imputed data.

*Well-being.* Table 5 shows the total effects of all direct and indirect paths from the social status variables to well-being. In this model, males had significantly higher levels of well-being compared to females. There was also a general increase in well-being with age. Among different family structures, there were no significant differences between single persons, couples, and single parents; however, two-parent families had higher

Table 5

## Total Effects of Social Status Variables on Well-being

	Unimputed	Imputed
Male	0.007* (0.003)	0.040** (0.011)
Female	<i>Ref.</i>	<i>Ref.</i>
Age	0.790** (0.218)	0.154** (0.048)
Single	<i>Ref.</i>	<i>Ref.</i>
Couple	0.007 (0.004)	0.031 (0.019)
Single parent	0.000 (0.004)	0.001 (0.023)
Two parent	0.008* (0.004)	0.041* (0.017)
< High school	<i>Ref.</i>	<i>Ref.</i>
High school	-0.001 (0.003)	0.006 (0.014)
Post-secondary	0.007* (0.003)	0.037** (0.014)
Income	0.232** (0.072)	0.005** (0.002)
Model $\chi^2$ (df)	9.620 (5) $p = 0.087$	5.585 (4) $p = 0.232$
<i>CFI</i>	0.996	0.999
<i>RMSEA</i>	0.042 $p = 0.563$	0.025 $p = 0.794$

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	Unimputed	Imputed
<i>GFI</i>	0.997	0.999

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*Note.* Unstandardized regression coefficients with standard errors in parentheses.

Standard errors generated using bootstrap method.

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

levels of well-being compared to single persons. There were also no significant differences between those with and without a high school diploma, but those with post-secondary had higher levels of well-being compared to those without high school. Well-being also improves with higher household incomes.

The statistically significant unstandardized pathways between social status, the mediating variables, and well-being are presented in Figures 4 and 5 (see Appendix B for the complete table of results). The direct effect of gender on stress was significant with men having lower average levels. The effects for mastery and well-being were significant using imputed data with men having higher scores on both variables. The direct effect of age on well-being was significant and positive. The effect of social support was significant using imputed data and suggested that perceived support decreases with age, which may reflect increase need for social support among older persons. Compared to single persons, couples had significantly lower stress levels and higher social support levels, but also had lower levels of well-being. There were no significant differences between single persons and single parents. Two-parent families had higher levels of social support but there were no significant differences in well-being. Result for educational attainment showed that those with high school or post-secondary had higher levels of mastery compared to those without a diploma. Those with higher household incomes had higher levels of mastery, social support, and well-being, but also reported higher levels of stress although the difference was only significant with imputed data. Among the mediating variables, the expected relationships were found. Stress was negatively related to well-being while mastery and social support were positively related.

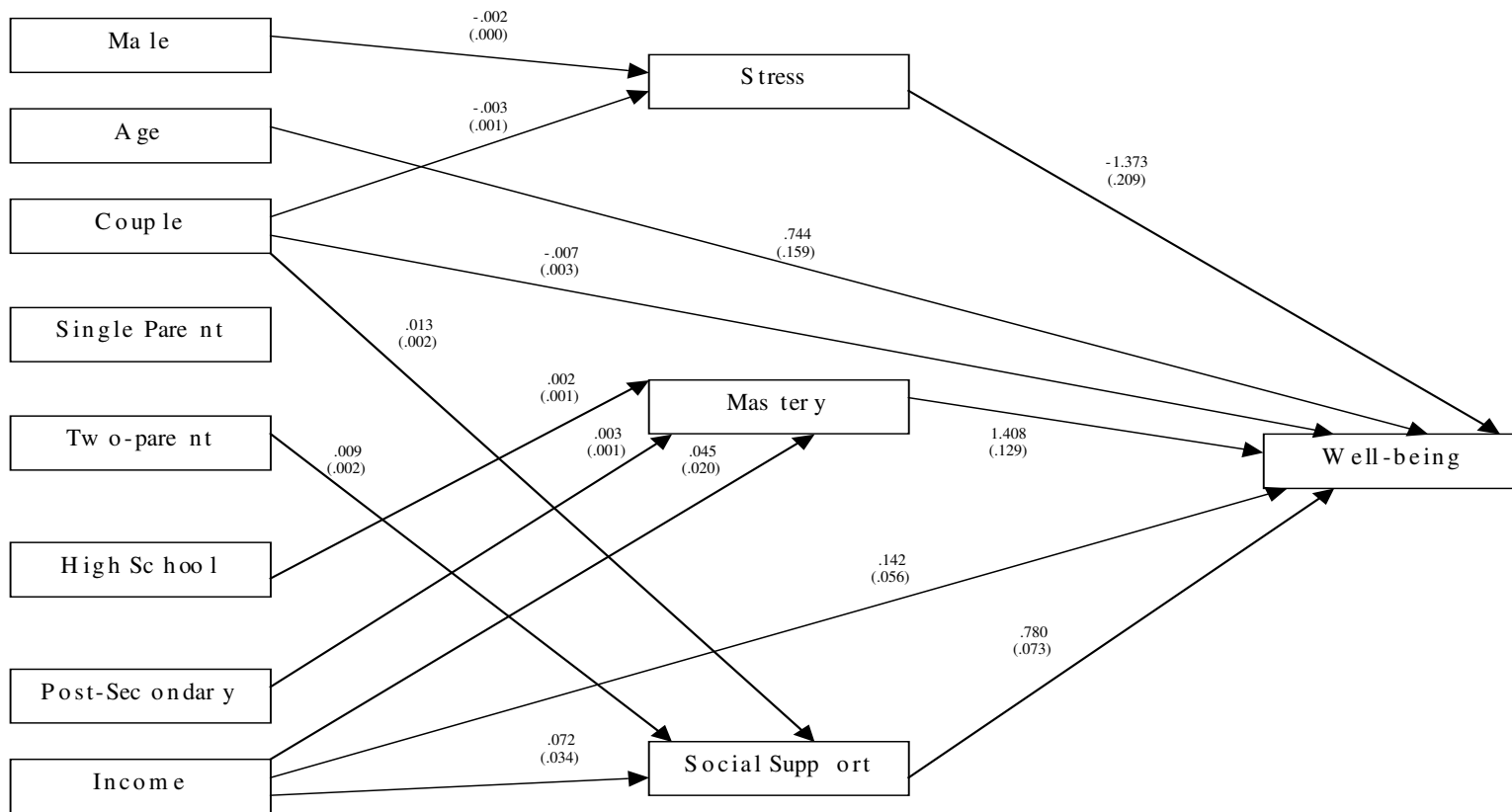


Figure 4. Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and well-being based on unimputed model.

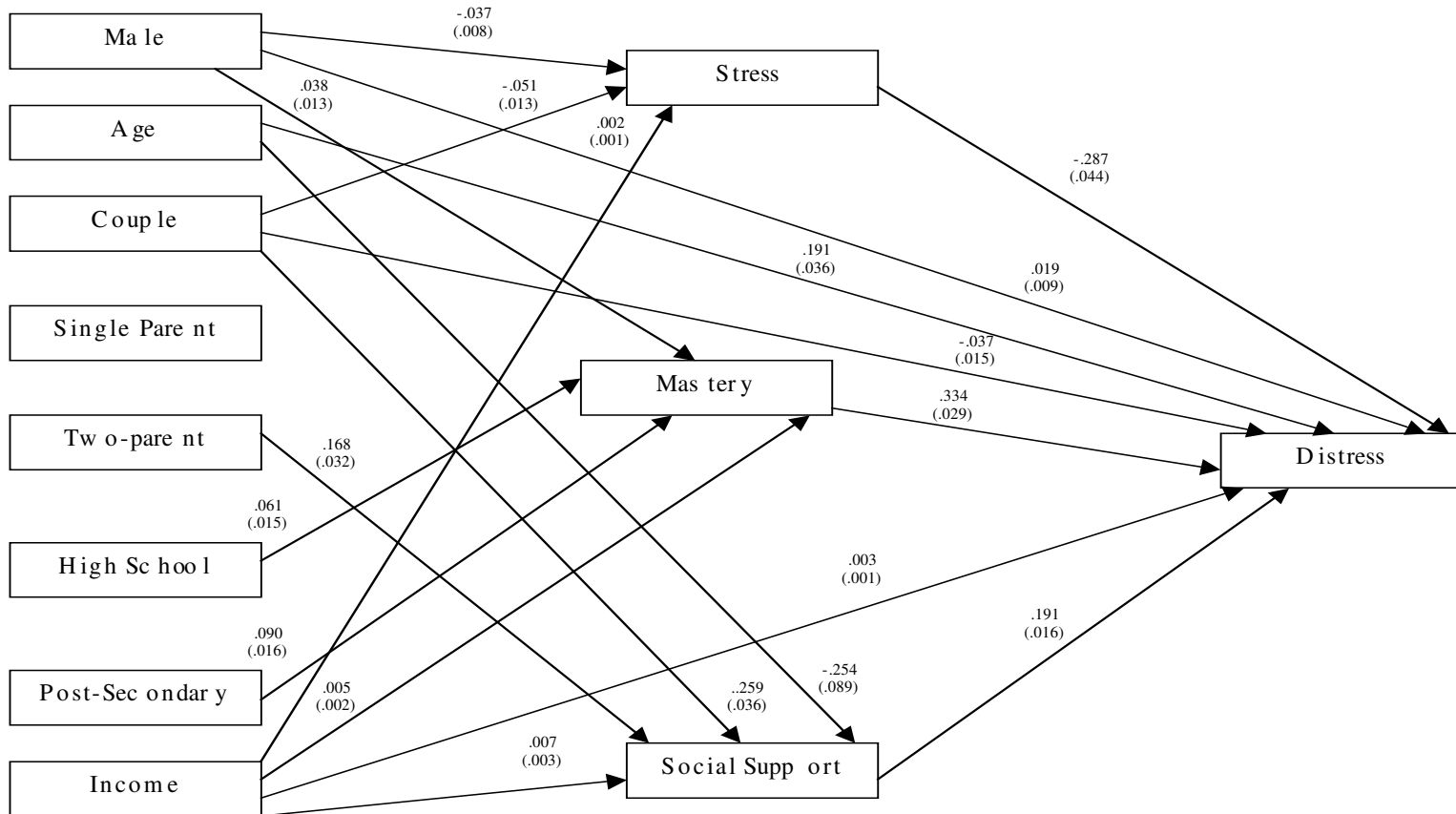


Figure 5. Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and well-being based on imputed model.

Table 6 presents the mediating effects of stress, mastery, and social support on well-being. While the total indirect effect for gender was significant only in the imputed data, the effect for stress was significant, which suggests that males have higher levels of well-being because they have lower levels of stress. Using imputed data, the effect for mastery was also positive and significant. The indirect effect of age was not significant except for a negative effect on well-being via social support in the imputed data.

Compared to single persons, couples had higher levels of well-being as a result of their lower levels of stress and greater social support. The total indirect effect for couples compared to single persons was also positive and significant. None of the contrasts between single persons and single parents were significant. Two-parent families had significantly higher levels of well-being due to their higher levels of social support. The total effect for two-parent families compared to single persons was also significant. Compared to those with less than high school, the indirect effect on well-being via mastery was significant for both high school and post-secondary graduates. In addition, there was a negative indirect effect on well-being via stress among post-secondary graduates, but the indirect effects through mastery and social support were positive as was the total indirect effect. The indirect effect of income on well-being through mastery and social support were both positive and significant, but the total indirect effect did not reach statistical significance.

To test the moderating effects of mastery and social support on stress, interaction terms were added to the distress and well-being models. There was no significant



Table 6

## Indirect Effects of Social Status on Well-being via Mediators

	Unimputed				Imputed			
	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect
Male	0.0027*** (0.0004)	0.0014 (0.0014)	-0.0008 (0.0008)	0.003 (0.002)	0.0106*** (0.0028)	0.0127** (0.0045)	-0.0021 (0.0042)	0.021** (0.008)
Female	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Age	0.0316 (0.0483)	0.0901 (0.0807)	-0.0757 (0.0775)	0.046 (0.146)	-0.0034 (0.0095)	0.0144 (0.0171)	-0.0485** (0.0175)	-0.037 (0.031)
Single	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Couple	0.0041** (0.0015)	0.0014 (0.0014)	0.0101*** (0.0018)	0.014** (0.003)	0.0146*** (0.0044)	0.0033 (0.0070)	0.0495*** (0.0080)	0.067** (0.014)
Single parent	0.0000 (0.0014)	0.0000 (0.0014)	0.0000 (0.0016)	-0.001 (0.003)	-0.0026 (0.0046)	0.0037 (0.0084)	-0.0025 (0.0084)	-0.001 (0.015)
Two-parent	0.0014 (0.0014)	0.0000 (0.0014)	0.0070*** (0.0017)	0.009** (0.003)	0.0052 (0.0035)	0.0020 (0.0060)	0.0321*** (0.0067)	0.039** (0.012)

	Unimputed				Imputed			
	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect	Stress	Mastery	Social support	Total <sup>a</sup> indirect effect
< High school	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
High school	0.0000 (0.0014)	0.0028* (0.0014)	-0.0008 (0.0008)	0.003 (0.002)	-0.0011 (0.0029)	0.0204*** (0.0053)	-0.0006 (0.0052)	0.019 (0.009)
Post-secondary	-0.0014*** (0.0002)	0.0042** (0.0015)	0.0016* (0.0008)	0.006** (0.002)	-0.0517*** (0.0084)	0.0301*** (0.0059)	0.0082 (0.0052)	0.033** (0.010)
Income	-0.0302 (0.0171)	0.0634* (0.0288)	0.0562* (0.0270)	0.090 (0.052)	-0.0006 (0.0003)	0.0017* (0.0007)	0.0013* (0.0006)	0.002 (0.001)

*Note.* Unstandardized regression coefficients with standard errors in parentheses. Coefficients calculated as  $ab = a \times b$  where  $a$  is the coefficient for the path from the social status variable to resource and  $b$  is the coefficient for the path from the resource to distress.

Standard errors calculated using the formula  $SE_{ab} = \sqrt{b^2 SE_a^2 + a^2 SE_b^2}$  where  $SE_a$  and  $SE_b$  are the standard errors for paths  $a$  and  $b$  respectively.

<sup>a</sup> Sum of all indirect pathways between social status variable and distress. Standard errors generated using bootstrap method.

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

improvement in model fit with the addition of interaction terms so the simpler model was retained ( $\chi^2_d(4) = 3.096, p = .542$  for both the distress and well-being models).

### Discussion and Conclusion

The results of these analyses enable several important conclusions about the social distribution of distress and well-being in the off reserve Aboriginal population to be drawn. First, stress, mastery, and social support are important determinants of both outcomes but their relative importance differs. Among the continuous variables in the distress model, the largest standardized coefficients among direct paths were found for stress ( $\beta = 0.312$ ), followed by mastery ( $\beta = -0.260$ ), and social support ( $\beta = -0.236$ ). In the well-being model, social support ( $\beta = 0.371$ ) and mastery ( $\beta = 0.366$ ) had higher relative importance than stress ( $\beta = -0.219$ ). These findings suggest that stress is a stronger contributor to negative mental health outcomes while psychosocial resources are more important for positive outcomes. Confirmatory analyses have suggested that distress and well-being are correlated, but distinct, dimensions that make up the higher order construct of mental health (Massé et al., 1998).

The results also support for the contention that stress and resources are related to social status, but certain statuses seem to matter for specific mediators. For example, education increases mastery but does not influence perceived stress or social support. The same conclusion can be drawn about mediating effects – specific statuses provide advantages in particular domains that translate into better outcomes. Mediating variables, such as stress and coping resources, appear to play an important role in connecting social status and mental health. With the exception of age and income in both models, and family structure in the well-being model, none of the direct paths between social status

and mental health were significant. In the case of age, only the direct effect was significant, which suggests that age is related to distress and well-being but not as a result of its relationship with stress, mastery, or social support. It may be that age is related to other mediating processes not considered in these analyses. The results for family structure suggest that it is marital status, rather than the presence of children in the household, that influences mental health outcomes. The results also imply that higher education and income are indirectly related to distress via their effect on stress. Further research is needed to confirm whether there are stressors that are associated with higher socioeconomic status. The literature suggests that highly educated and employed Aboriginal people are exposed to more discrimination (Whitbeck et al., 2002). The insignificant moderating effects should be interpreted with caution since the measure of stress used in these analyses is self-perceived stress, which may already take into account coping resources. Those with fewer resources may perceive the same stressors to be more stressful. Overall, the findings suggest that the stress process model has utility in guiding research about the interrelationships between the social structure, stress, resources, and mental health in the Aboriginal population.

#### Future Research

Part of the appeal of the stress process model is that it is not intended to be a totalizing and universal theory, but rather a general orienting framework that guides research into the social origins of distress and disorder (Pearlin, 1999). Pearlin (1999) asserted, “in addition to collecting extensive information about people’s social and economic characteristics, and the contexts of their daily lives, research should ideally employ a host of measures appropriate to the particular issues and populations under

investigation (p. 412). Future research should adapt existing measures and developing new ones specific to the Aboriginal population. For example, there is little debate that disturbing or distressing thoughts, feelings, and behaviours exist and have been reported trans-historically and cross-culturally; however, the specific symptoms, and how these manifestations are understood and addressed is contextually, culturally, and historically specific (Horwitz, 2002a). Researchers may need to consider outcomes beyond distress and disorder. Umberson, Williams, and Anderson (2002) argued that some individuals or groups are more likely to react to stress with violence. Ignoring these outcomes would underestimate the burden of stress among those who react in ways not commonly measured. With respect to stress, research can address questions that include: What are the stressors in the stress universe of Aboriginal peoples? Do some social groups disproportionately experience certain ones? Are some more salient to specific sub-groups? Are some more deleterious to mental health than others?

Research also needs to consider both social status and culture in the stress process. Simon (2000) argued, "...the failure to include structural *and* cultural factors in current explanations of the differential effects of stress on mental health has serious consequences for theory and research in this area because it results in underestimates of the importance of social conditions for the etiology of mental illness" (p. 68).

Connection traditional culture may be an important resource that buffers against stress. We must also be clear about whether we are interested in ethnicity or culture. Ethnicity alone tells us little about the cultural belief system of a person or a group of people (Moran, Fleming, Somervell, & Manson, 1999). As a result, we can say little about how culture influences mental health and illness (Agbayani-Siewert et al., 1999). The term

Aboriginal is a social construction that encompasses a diverse group of people with vastly different ancestry, histories, colonial experiences, contemporary conditions, and cultures. If we are interested in culture then we must empirically investigate the extent to which a group of people share a common culture and the degree to which that culture differs from others (Waldram, 2004).

Researchers may also consider why there are disparities between different social groups within the Aboriginal population in terms of stress, mastery, and social support? For example, why do women have higher levels of stress even after controlling for differences in age, family structure, education, and income? There may also be important interrelationships between stress and resources that will provide insight into the processes that shape mental health (Avison & Cairney, 2003; Wheaton, 1985). For example, when do resources buffer the negative effects of stress and when do they act as a stress deterrent? A requirement of path analysis is that equivalent or alternative models be considered (Kline, 2005). While the stress process hypothesizes that social stress causes mental health and illness, it is also possible that there are reverse paths as well; that is poorer mental health makes people more likely to experience certain types of stressors (Turner, Marino et al., 1995). In the case of equivalent models, adjudication is based on theoretical, rather than statistical, criteria since model fit will be the same (Kline, 2005). Therefore, sound theorizing about how and why stress and resources are related is required before statistical analyses are carried out.

Finally, while quantitative approaches enable us to make comparisons among different strata of the social structure, it tells us nothing about the social realities of the people who occupy those positions. Qualitative approaches enable researchers to consider

the meaning and process, as well as generating new or elaborating on old theoretical insights (Pearlin, 1992).

### Limitations

While distress is conceptualized as a non-specific outcome measure, the items in the scale tend to reflect symptoms of affective and anxiety disorders. Although these are among the most prevalent psychiatric diagnoses, persons with other manifestations of distress or disorder, such as paranoia, anger, violence, or substance abuse, may receive a lower distress score because these dimensions are not directly measured. Since women are more likely to express distress in this way, there may be gender bias. Future research aim to develop measures that cover the spectrum of distress manifestations (Aneshensel, 2005; Horwitz, 2002b). Measures that fit cultural notions of mental health or illness are also needed to provide an accurate picture. For example, Inuit in Nunavik reported having no word for mental illness in their language, but made reference to two terms, which referred to thinking too much or not thinking at all. In addition, Inuit respondents tended to label states rather than people, which has implications for measures of lifetime disorder or disorder in any other time period than the present (Kirmayer, Fletcher, Corin, & Boothroyd, 1997).

Ideally, we should examine the impact of both social disadvantage and cultural loss at the same time. However, existing data does not allow researchers to do so. Most surveys designed for the general Canadian population do not include adequate measures of constructs related to culture. The only large-scale national survey of Aboriginal peoples in Canada is the Aboriginal Peoples Survey (APS), which has limited measures of mental health outcomes.

This study is also not representative of the entire Aboriginal population since reserves, remote communities, and the territories are excluded. The evidence suggests that, overall, residents of these regions face worse socioeconomic conditions than Aboriginal people living off reserve. For example, McHardy and O'Sullivan (2004) reported that First Nations had an average Community Well-Being Index (CWB) score, which measures community socioeconomic conditions, of 0.66 while other Canadian communities scored 0.81. Senécal and O'Sullivan (2006) found that Inuit communities had CWB scores that were slightly higher than First Nations communities, but both were significantly lower than other Canadian communities. White and Maxim (2007) matched reserve and non-reserve communities based on proximity and population size. They found that the disparity in CWB scores were larger as isolation increased. These populations may face unique challenges that warrant in-depth examination.



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Appendix A

Direct Effects Between Social Status and Mediating Variables and Distress

	Unimputed				Imputed			
	Stress	Mastery	Social support	Distress	Stress	Mastery	Social support	Distress
Male	-0.002 <sup>***</sup> (0.000)	0.001 (.001)	-0.001 (0.001)	0.001 (0.002)	-0.037 <sup>***</sup> (0.008)	0.038 <sup>**</sup> (0.013)	-0.011 (0.022)	0.000 (0.041)
Female	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Age	-0.023 (0.035)	0.064 (0.057)	-0.097 (0.099)	-0.631 <sup>***</sup> (0.180)	0.012 (0.033)	0.043 (0.051)	-0.254 <sup>**</sup> (0.089)	-0.731 <sup>***</sup> (0.163)
Single	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Couple	-0.003 <sup>***</sup> (.001)	0.001 (0.001)	0.013 <sup>***</sup> (0.002)	0.006 (0.004)	-0.051 <sup>***</sup> (0.013)	0.010 (0.021)	0.259 <sup>***</sup> (0.036)	0.156 <sup>**</sup> (0.068)
Single parent	0.000 (0.001)	0.000 (0.001)	0.000 (0.002)	-0.002 (0.004)	0.009 (0.016)	0.011 (0.025)	-0.013 (0.044)	-0.053 (0.079)
Two-parent	-0.001 (0.001)	0.000 (0.001)	0.009 <sup>***</sup> (0.002)	-0.002 (0.003)	-0.018 (0.012)	0.006 (0.018)	0.168 <sup>***</sup> (0.032)	-0.032 (0.059)
< High school	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
High school	0.000	0.002 <sup>**</sup>	-0.001	-0.001	0.004	0.061 <sup>***</sup>	-0.003	-0.039

	Unimputed				Imputed			
	Stress	Mastery	Social support	Distress	Stress	Mastery	Social support	Distress
	(0.001)	(0.001)	(0.001)	(0.003)	(0.010)	(0.015)	(0.027)	(0.049)
Post-secondary	0.001 (0.000)	0.003*** (0.001)	0.002 (0.001)	-0.004 (0.003)	0.018 (0.020)	0.090*** (0.016)	0.043 (0.027)	-0.092 (0.051)
Income	0.022 (0.012)	0.045* (0.020)	0.072* (0.034)	-0.227*** (0.063)	0.002* (0.001)	0.005** (0.002)	0.007* (0.003)	-0.024*** (0.006)
Stress	-	-	-	1.961*** (0.236)	-	-	-	1.975*** (0.201)
Mastery	-	-	-	-0.999*** (0.146)	-	-	-	-1.001*** (0.131)
Social support	-	-	-	-0.498*** (0.083)	-	-	-	-0.544*** (0.074)

*Note.* Unstandardized regression coefficients with standard errors in parentheses.

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

Appendix B

Direct Effects of Social Status and Mediating Variables and Well-being

	Unimputed				Imputed			
	Stress	Mastery	Social support	Well-being	Stress	Mastery	Social support	Well-being
Male	-0.002*** (0.000)	0.001 (0.001)	-0.001 (0.001)	0.003 (0.002)	-0.037*** (0.008)	0.038** (0.013)	-0.011 (0.022)	0.019* (0.009)
Female	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Age	-0.023 (0.035)	0.064 (0.057)	-0.097 (0.099)	0.744*** (0.159)	0.012 (0.033)	0.043 (0.051)	-0.254** (0.089)	0.191*** (0.036)
Single	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Couple	-0.003*** (0.001)	0.001 (0.001)	0.013*** (0.002)	-0.007* (0.003)	-0.051*** (0.013)	0.010 (0.021)	0.259*** (0.036)	-0.037* (0.015)
Single parent	0.000 (0.001)	0.000 (0.001)	0.000 (0.002)	0.000 (0.003)	0.009 (0.016)	0.011 (0.025)	-0.013 (0.044)	0.002 (0.017)
Two-parent	-0.001 (0.001)	0.000 (0.001)	0.009*** (0.002)	0.000 (0.003)	-0.018 (0.012)	0.006 (0.018)	0.168*** (0.032)	0.002 (0.013)
< High school	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
High school	0.000	0.002**	-0.001	-0.003	0.004	0.061***	0.003	-0.013

	Unimputed				Imputed			
	Stress	Mastery	Social support	Well-being	Stress	Mastery	Social support	Well-being
	(0.001)	(0.001)	(0.001)	(0.002)	(0.010)	(0.015)	(0.027)	(0.011)
Post-secondary	0.001 (0.000)	0.003*** (0.001)	0.002 (0.001)	0.001 (0.002)	0.018 (0.010)	0.090*** (0.016)	0.043 (0.027)	0.004 (0.011)
Income	0.022 (0.012)	0.045* (0.020)	0.072* (0.034)	0.142* (0.056)	0.002* (0.001)	0.005** (0.002)	0.007* (0.003)	0.003* (0.001)
Stress	-	-	-	-1.373*** (0.209)	-	-	-	-0.287*** (0.044)
Mastery	-	-	-	1.408*** (0.129)	-	-	-	0.334*** (0.029)
Social support	-	-	-	0.780*** (0.073)	-	-	-	0.191*** (0.016)

*Note.* Unstandardized regression coefficients with standard errors in parentheses.

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

CHAPTER 4

Intergenerational Residential School Attendance and Educational Attainment among First

Nations: A Cohort Analysis

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Intergenerational Residential School Attendance and Educational Attainment among First Nations: A Cohort Analysis

“Most Aboriginal people and most researchers who work with them agree that the ‘*present*’ Aboriginal communities are a direct legacy of their traumatic ‘*past*’” (Wesley-Esquimaux & Smolewski, 2004, p. 7).

The Government of Canada’s Statement of Apology to former residential school students on June 11, 2008 marks an important symbolic point in the healing and reconciliation process. However, tangible changes that reduce disparities between Aboriginal peoples and other Canadians are also required in order to forge new relationships built on respect and equality. While most scholarly work includes the caveat that the contemporary conditions of Aboriginal peoples should be understood within the context of colonialism, there have been few empirical examinations of the pathways between historic events and the present. How do differences in colonial experiences help to explain variations in contemporary conditions between communities, groups, and individuals? How have subsequent actions on the part of governments, communities, families, or individuals compounded or ameliorated these effects? How have they created profiles of risk and resilience? Answering these questions will provide a deeper, more complete understanding of the impacts of colonialism and historic trauma and, most importantly, suggest which strategies may be most effective in healing and overcoming negative cycles that give rise to disadvantaged social and economic conditions.

This research is a small step toward this goal by examining educational attainment across different generations of residential school survivors. It considers how social, geographical, and health variables influence generational patterning. It also investigates



the role of language retention and perceptions about the accuracy of information provided about Aboriginal peoples at school as potential intervening variables.

## Literature Review

### *Educational Attainment*

Educational attainment has been identified as one of the key factors in improving conditions among Aboriginal peoples for several reasons. One is that education is the foundation for other dimensions of socioeconomic status, such as occupation and income. Furthermore, research has demonstrated important returns on education among Aboriginal peoples. For example, there is an inverse relationship between education and unemployment (Hull, 2005; H. Tait, 1999). There appear to be additional benefits to those who complete post-secondary training. Walters, White and Maxim (2004) found that Aboriginal university graduates earned more than their non-Aboriginal counterparts. At this level of educational attainment, both Aboriginal men and women earned more than non-Aboriginal men. In addition, there is support within the Aboriginal community for improving educational outcomes as a way of improving social and economic conditions, achieving self-governance, and participating fully in Canadian society (Royal Commission on Aboriginal Peoples, 1996; Silver & Mallett, 2002).

Research has generally found that educational gains made by Aboriginal people have been offset by larger increases among non-Aboriginals (Hull, 2005; H. Tait, 1999). Nevertheless, the number of Aboriginal people without a high school diploma decreased, while the number with a high school diploma or post-secondary credentials increased between 1996 and 2001 ("Update on education," 2003). According to the 2006 Census, 42% of First Nations had post-secondary credentials with 17% having a college diploma,

13% having a trades certificate, and 7% having a university degree (Statistics Canada, 2008)<sup>17</sup>. Aboriginal people are more likely to have a trade certificate compared to non-Aboriginals. Slightly more non-Aboriginals have a college education compared to Aboriginals, but there is a large gap at the university degree level (23% compared to 8% respectively) (Clement, 2009; "Update on education," 2003). It should be noted that some of the gains in Aboriginal education over this period are attributable to ethnic mobility, which refers to a change in ethnic identity between two time periods (Guimond, 2003). Many of those who newly identified as Aboriginal over this time period were relatively better educated and, as a result, increased average levels of education.

Aboriginal people also tend to progress through secondary and post-secondary education more slowly than non-Aboriginals and are less likely to graduate (Hull, 2005). For example, 2001 data show that the gap between the percentage of Aboriginals and non-Aboriginals with any post-secondary education is largest among 15 to 24 year-olds. The gap narrows among 25 to 44 year-olds and again among the 45 to 64 age group (Hull, 2005). This trend suggests that a significant proportion of the Aboriginal population start post-secondary education after age 24.

The patterning of educational attainment appears to be at least partially related to geography. In general, those who live off reserve, especially those in urban centres, tend to have higher educational attainment (Canadian Centre for Justice Statistics, 2001). Among First Nations aged 25 to 64, those living off reserve had lower rates of high

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<sup>17</sup> There were substantial changes to the education questions on the 2006 Census questionnaire, which limits that ability to make comparisons with 2001 Census data. Specifically, the categorization of non-university degree levels of educational attainment changed between 2001 and 2006.

school non-completion and higher rates of high school and post-secondary completion compared to their on reserve counterparts (Statistics Canada, 2008). Geographical differences may help to explain why Métis and non-Status Indians, the majority of whom live off reserve and outside the Arctic, have higher levels of educational attainment than Status Indians and Inuit (Hull, 2005). Young Aboriginals who live in large cities are the most likely to have a university degree (H. Tait, 1999). Research from Australia has demonstrated that where there are no or few tangible returns to education, rates of attainment tend to be lower (White, Spence, & Maxim, 2005). Rural or remote communities with few opportunities for economic development are less likely to offer employment opportunities for those with higher education.

One potential factor that may contribute to the gap in educational attainment between Aboriginal and non-Aboriginal Canadians is residential school attendance and its consequences. The literature suggests residential schools may directly and indirectly affect the educational attainment of Survivors and subsequent generations.

### *Residential Schools*

The Aboriginal Healing Foundation defined residential schools as those that were part of “the residential school system in Canada attended by Aboriginal students. This may include industrial schools, boarding schools, homes for students, hostels, billets, residential schools, residential schools with a majority of day students or a combination of any of the above” (Castellano, 2006, p. iii). The schools were operated in partnership with religious groups, primarily Christian churches (Castellano, 2006). The first boarding schools for Aboriginal children operated in Nouvelle-France in the 1620s, but closed in less than a decade due to low enrolment. Church run Indian industrial schools emerged in

the 1800s, but attendance was not mandatory. Pressure from homesteaders to remove or neutralize Aboriginal peoples, along with the end of conflicts requiring military alliances with First Nations, increased support for boarding schools during the mid-1800s (Claes & Clifton, 1998). While residential schools became prominent in the 1830s, it was not until 1879 that they became part of the official policy of the Government of Canada. The passing of legislation made attendance compulsory (Grant, 1996). Residential schools were seen as a way of addressing “the Indian problem” through assimilation of children into Christian, European society (Castellano, 2006). The ideology underlying the creation of residential schools was that children could be “saved” from their “primitive” ways and be civilized, but that adults were an impediment to this process. Therefore, children needed to be removed from their families and communities in order to be effectively indoctrinated with the values, faith, and skills of non-Aboriginal society (Royal Commission on Aboriginal Peoples, 1996).

Aboriginal languages and culture were targeted as ties that obstructed the full assimilation of children (Haig-Brown, 1988). The Royal Commission on Aboriginal Peoples (1996) noted:

The department and churches understood the central challenge they faced in civilizing the children as that of overturning Aboriginal ontology is seen in their identification of language as the most critical issue in the curriculum. It was through language that children received their cultural heritage from parents and community. (p. 11)

While the Government of Canada began dismantling the system in 1969, the last residential school did not close until 1996. Over the history of residential

schools, 130 or more schools existed with the highest numbers in the 1930s (Castellano, 2006). Data from the 2002 to 2003 First Nations Regional Longitudinal Health Survey (RHS) revealed that 20.3% of adults in the survey attended residential school with an average length of attendance of 4.8 years. Most began residential school at about age 10 and left around age 15. Most Survivors are age 40 and over, which coincides with the decline in the residential school system after the 1950s. Interestingly, those who attended are more likely to speak a First Nations language than those who did not attend (69.7% versus 37.4% respectively) (RHS National Team, 2007).

The literature documents a wide range of traumas as a result of exposure to the residential school system. In addition to the loss of familial and community bonds as a result of forced removal of children, many experienced neglect and/or physical, mental, sexual, and spiritual abuses while at residential school. The RHS showed that almost of half of residential school survivors reported their overall health and well-being was negatively affected by their experiences. In order of prevalence, the negative impacts reported in the survey included isolation from family, verbal or emotional abuse, harsh discipline, loss of cultural identity, separation from home community, witnessing abuse, physical abuse, loss of traditional religion or spirituality, bullying, poor education, harsh living conditions, lack of food, lack of proper clothing, and sexual abuse (RHS National Team, 2007). Furthermore, rates of morbidity and mortality at these institutions were exceedingly high (Grant, 1996). Children were forced to engage in exploitative physical labour as part of their “education” and often endured impoverished living conditions (Claes & Clifton, 1998). The long-term consequences of these experiences are often

described as a variety of losses. These include loss of culture, trust, love and security, identity, and innocence. In turn, these losses have become manifest in a range of negative outcomes that contribute to social and economic disadvantage across generations.

In terms of educational attainment, individuals who attended residential schools were often directly disadvantaged. Documents show that few children successfully completed the program. Low rates of completion can be attributed to the trauma of being separated from family and community, neglect and abuse, impoverished conditions, lack of nutritious food, high rates of illness and death, and culturally inappropriate pedagogy. The evidence also suggests that children were being prepared for jobs involving menial labour. Academic study was limited to half a day with religious and vocational instruction in the other half. Furthermore, the system was chronically under funded, which, in addition to isolation, made it difficult to recruit and retain qualified staff (Royal Commission on Aboriginal Peoples, 1996).

Residential schools survivors have reported a number of negative consequences as a result of their experiences such as alcohol and drug abuse, violence, depression, suicide, neglectful or abusive parenting, and dependency on non-Native society (Claes & Clifton, 1998). Survivors of residential schools were often poorly prepared to become parents themselves due to a lack of positive role models within the residential school system, which led some to adopt maladaptive parenting styles with their own children (Stout & Kipling, 2003). This process is one of the key mechanisms through which residential schools affected subsequent generations. Research examining the general population has demonstrated that dimensions of parenting such as parenting style, affective relationships, engagement and involvement, and expectations affect the academic achievement of

children and adolescents (Audas & Wilms, 2001; Brown & Iyengar, 2008; Rumberger, Ghatak, Poulos, Ritter, & Dornbusch, 1990; Simons-Morton & Chen, 2009).

Two concepts have been developed to describe outcomes specific to residential school survivors. Residential school syndrome describes a post-traumatic stress disorder (PTSD) type symptomology that includes difficulties with sleep, anger management, or concentration, intrusive memories, nightmares, flashbacks, avoidance of memory triggers, detachment, difficulties with relationships, and reduced interest or participation in cultural activities (Brasfield, 2001). What distinguishes it from PTSD is: 1) the effect on culture; 2) strong association with alcohol or drug abuse and outbursts of violence while under the influence; and 3) deficiencies in parenting skills (Brasfield, 2001).

Second, the concept of historical trauma has been proposed to explain the colonial origins of social disorders that are passed from generation to generation (Yellow Horse Brave Heart & DeBruyn, 1998). It has been conceptualized as “a collective complex trauma inflicted on a group of people who share a specific group identity or affiliation—ethnicity, nationality, and religious affiliation. It is the legacy of numerous traumatic events a community experiences over generations and encompasses the psychological and social responses to such events” (Evens-Campbell, 2008, p. 320). This model theorizes that there is no single response to historic trauma (Wesley-Esquimaux & Smolewski, 2004). “Historic trauma causes deep breakdowns in social functioning that may last for many years, decades or even generations. The clusters of symptoms associated with specific disorders that manifest themselves as a result of historic trauma may be *passed* to the next generations in a form of socially learned behavioural patterns. In a sense, symptoms that parents exhibit (family violence, sexual abuse) act as a trauma and disrupt adaptive social adjustments in their children” (Wesley-Esquimaux &

Smolewski, 2004, p. 65).

The consequences of residential schools have been transmitted from parents to children resulting in intergenerational Survivors (Stout & Kipling, 2003). It is through the transmission of trauma that this research proposes the children and grandchildren of residential school survivors have been impacted in ways that may negatively affect educational attainment.

#### *Chains of Adversity and Educational Attainment*

Life course perspectives provide concepts that aid in the establishment of connections between intergenerational residential school trauma and educational attainment. The life course perspective theorizes that sociohistorical influences are transmitted through networks of shared relationships (Elder, Johnson, & Crosnoe, 2003; George, 1999), which dovetails with the notion of intergenerational trauma. The lives of parents and children are linked across generations because the life histories of parents create the conditions into which children are born and raised.

Residential school survivors may be directly disadvantaged in terms of their educational attainment because of the poor quality of education they received, as well as factors such as trauma, poor living conditions, high rates of illness, and cultural incompatibility, which may have impaired their ability to complete the program. In addition, the traumas experienced at residential school may set off chains of adversity (O'Rand, 1996; Pearlin, Schieman, Fazio, & Meersman, 2005) that may make future educational attainment less likely. In turn, the children of Survivors may be more likely to experience social and economic disadvantage as a result of poverty, social disorder, and the loss of traditional parenting practices. These conditions may impair their own



ability to attain higher levels of education. Thus, those who have a direct or indirect connection to the residential school system may have different educational trajectories compared to those without a personal or familial history. Research on non-Aboriginal populations have found robust connections between childhood traumas, including parental death, parental divorce, abuse, sexual assault, family violence, and poverty, and mental illness later in life (George, 1999), which has in turn been associated with truncated educational attainment (Kessler, Foster, Saunder, & Stang, 1995). The RHS study found that half adults whose parent(s) attended residential school believed that it negatively affected how they were parented as children. In addition, the majority believed the attendance of their grandparent(s) negatively affected how their parents were parented as children (RHS National Team, 2007)

On the other hand, a core concept in life course perspectives is heterogeneity. While we would expect that those with a personal, parental, or grandparental connection to residential schools to have disadvantaged conditions *on average*, not all survivors and their dependents would experience exactly the same outcomes. One reason is that the experience of residential school would be different across individuals, cohorts, and time periods both because of differences in their actual experiences and perceptions of it. Another reason is that the impact of residential schools would depend on the stresses and traumas experienced as well as coping resources. Intervening mechanisms may enable transitions that ameliorate or mitigate negative impacts creating conditions that make social and economic gains more probable. For example, research has demonstrated that what happens in the period immediately following a traumatic event is critically important to the chances of recovery (George, 1999). Finally, individuals and

communities exercise personal agency in making choices and taking actions that shape their own life course and future trajectories within the context of historical and social constraints (Elder et al., 2003). Movements to reclaim Aboriginal spirituality and assert political and social rights may be especially beneficial to those who have been impacted most by colonialism.

#### *Potential Protective Factors*

There are a wide range of factors that may bolster the resilience of those who have experienced trauma. Of particular interest in this research are those that are theorized to directly counteract the culture damage as a result of residential school exposure. Stout and Kipling (2003) argued that one of the consequences of colonialism was to undermine resilience within traditional Aboriginal societies. Residential schools served to undervalue and stifle Aboriginal languages and beliefs, and break ties between children, families, and communities. Reclaiming traditional values, beliefs, and practices are seen as ways of instilling protective factors in individuals and communities in order to bolster resilience to risk. Potential protectors include strong Aboriginal identity, connection to traditional culture, and close relationships with extended family (Stout & Kipling, 2003); however, little research has examined these theoretical links.

Stout and Kipling (2003) noted:

Culture is linked to resilience by two principal respects. On the one hand, cultural norms condition parent-child interactions in ways that can either facilitate or constrain the development of protective factors. On the other hand, manifestations of one's culture (for example, traditions, ceremonies

and language) are often important sources of pride and self-esteem, servicing to support individuals in their struggles against adversity. (p. 23)

Similarly, Wesley-Esquimaux and Smolewski (2004) argued, “a properly rewritten history of Aboriginal people must be included in the school curriculum” (p. 81). Others have argued that education that does not reflect traditional Aboriginal values and culture may contribute to high rates of non-completion (Hookinmaw-Witt, 1998). Silver and Mallett (2002) found that the vast majority of Aboriginal students wanted to learn about Aboriginal peoples in school and felt that these teaching were important for building a sense of identity and self-esteem.

## Method

### *Research Questions*

While the theoretical model for this research draws on life course perspectives and the literature on the intergenerational transmission of trauma, available data are cross-sectional. As a result, we can only capture a single point in time, rather than processes over time. This research undertakes the modest goal of examining the patterning of educational attainment across different generations of residential school Survivors in three cohorts<sup>18</sup> of First Nations adults. In particular, it examines: 1) how the effects of residential school on educational attainment are patterned by intergenerational proximity and intergenerational density; 2) whether the effects of intergenerational transmission on education compound, stay the same, or diminish across generations; and

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<sup>18</sup> Cohort is used to refer to a group of individuals who were born during a particular historical period. The term highlights differences related to historical period rather than age.

3) whether factors such as language retention or accurate teaching about Aboriginal peoples moderate the relationship? Establishing intergenerational patterns will provide a starting point for more in-depth probing of the underlying mechanisms that enable or impede educational attainment across generations.

#### *Data*

The data for these analyses come from the 2001 cycle of Statistics Canada's Aboriginal Peoples Survey (APS). The survey uses a cross-sectional design. Individuals who indicated they had Aboriginal identity or ancestry (either North American Indian, Métis, or Inuit) on the 2001 Census were included in the sampling frame. Those who identified as being a Treaty or Registered Indian or having Indian Band or First Nation member status were also included. Regional coverage included all ten provinces and three territories. The survey excludes those living in collective dwellings such as rooming houses, hospitals, or prisons. Respondents in the adult file were aged 15 and over. A strength of the APS, compared to other national surveys, is the inclusion of First Nations communities (also known as reserves); however, the resulting sample is not representative of the entire on reserve population. The sampling frame included only the largest reserves in each province due to confidentiality and cost considerations. In addition, some reserves refused to participate in either the Census or APS, which resulted in coverage errors (Statistics Canada, 2003).

### *Sample*

The data used in these analyses comes from the Adult Core Master File, which contained responses from 60,500<sup>19</sup> respondents aged 15 and over. Since the focus of this research is on educational attainment, individuals under the age of 25 were excluded since this age group is most likely to have not completed their education. Those aged 55 and over were also excluded since there has likely been a sizable lag between the completion of their education and the collection of data in this survey, which means the data may inaccurately reflect the conditions under which their highest credentials were attained. In addition, the analyses were limited to respondents who answered “yes” that they identified as North American Indian, who will be referred to here as First Nations. Only First Nations were selected for these analyses in order to reduce some of the variation in residential school experience. Data from the APS show that First Nations had the largest number of residential school attendees ( $N = 2,690$  or 11.4% attendance rate). Only Inuit had a higher rate of attendance (13.5%), but much smaller numbers ( $N = 230$ ). There were a total of 16,100 bootstrap weighted cases meeting the inclusion criteria. Of those, 15,210 (94.4%) indicated having First Nations identity only, while 890 (5.5%) reported having First Nations and at least one other identity.

### *Cohorts*

A cohort approach was used since there have been significant changes in residential school attendance and educational attainment over time. Official records

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<sup>19</sup> In accordance with Statistics Canada’s guidelines for post-censal surveys, all frequencies and totals have been rounded to the nearest unit of 10. Ratios, percentages, and averages are calculated based on rounded frequencies and totals (Statistics Canada, n.d.-b).

demonstrate there were different eras in the history of the residential school system (Castellano, 2006) that created different profiles among Survivors and their children and grandchildren. In addition, average levels of educational attainment have increased over time in response to the demands of a knowledge-based economy. For example, between 1990 and 2007, the percentage of Canadians without a high school diploma dropped from 38% to 22%, while attainment of college or trade certification increased from 22% to 31%. The percentage of the population with a university degree rose from 11% to 19% over the same time period (Human Resources and Skills Development Canada, n.d.). In order to separate out effects related to historical period, the sample was divided into cohorts based on age: 25 to 34, 35 to 44, and 45 to 54. Since there is little published data about the profile of residential school survivors, descriptive data are presented for those in the 55 to 64 and 65 and over cohorts, but these cohorts were excluded from regression analyses.

### *Measures*

The educational attainment measure was created by recoding the highest level of schooling variable into three categories. Those who had not attained a high school diploma or equivalent were coded into the “less than high school” group. Respondents who indicated that they had completed a high school diploma, but had not completed post-secondary training were coded into the “high school” group. This group also included individuals who had some post-secondary training. The final group was made up of individuals who had completed a trade or non-university diploma or certificate, as well as those with a university degree. This group was labelled “post-secondary”. Since multinomial logistic regression is more robust with groups of similar size, the university,

college, and trade school graduates were considered together since only a small percentage had a university degree. The rationale for grouping respondents according to highest level of education completed is that these credentials are what translate into employment and income benefits. The high school group was set as the reference category in all analyses in order to examine which variables affect the odds of having higher and lower attainment.

Residential school status was conceptualized in two ways. The first was intergenerational proximity. Four groups were created based on the closest generation with residential school experience. Respondents who indicated that they had attended residential school were coded into the “self” group. Those who reported that they had not attended residential school, but had at least one parent who had were coded into the “parent” group<sup>20</sup>. Those who had a grandparent who attended, but no other generation who attended, were included in the “grandparent” group<sup>21</sup>. The final group was made up of respondents who neither attended residential school nor did they have parents or grandparents who attended. This group was labelled “no history”. Among those in the no history group, 650 had another family member who attended residential school while 4,320 did not report that any family member attended. Since these analyses theorize

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<sup>20</sup> Among those age 25 and over who had a parent who attended, 2,010 (38.2%) indicated only their mother attended, 970 (18.4) indicated only their father attended, and 2,280 (43.3%) indicated both parents attended.

<sup>21</sup> Among those aged 25 and over who had a grandparent who attended, 550 (19.6%) indicated only their grandmother(s) attended, 270 (9.6%) indicated only their grandfather(s) attended, and 1,980 (70.7%) indicated attendance by both grandmother(s) and grandfather(s).

vertical transmission to be of greater significance to offspring compared to horizontal transmission between members of the same generation (e.g., siblings) or transmission across more distant relations (e.g., aunts or uncles), individuals with other ties to the residential school system are considered alongside those without any familial ties. The no history group served as the reference category.

The second conceptualization was intergenerational density. In these models, respondents were coded according to how many generations attended residential school. Individuals who did not attend or have a parent or grandparent attend were coded in the zero generations category, which was the reference group. Those who had one generation who attended (whether themselves, a parent, or grandparent) were included in the one-generation category. Similarly, those who had two generations or all three generations who attended were included in the two-generation and three-generation categories respectively.

The only demographic control was sex, which was dummy coded with females as the reference category.

Additional controls were added for Registered Indian Status and community type and community region. Registered Indian Status refers to whether or not a respondent is registered under *the Indian Act*. Registered or Status Indians “are people who are registered with the federal government as Indians, according to the terms of the *Indian Act*... Status Indians have certain rights and benefits that are not available to non-Status Indians or Métis people. These may include on reserve housing benefits, education, and exemption from federal, provincial, and territorial taxes in specific situations” (Indian and Northern Affairs, 2003). Those who indicated they were Registered under *the Indian*



*Act* were coded as Status. Those who were not registered were categorized as non-Status, which was the reference group. Respondents also indicated whether they lived on or off reserve. Off reserve was set as the reference category. Communities were also classified according to whether it was urban, rural, or Arctic. Urban was set as the reference and rural and Arctic were combined due to small numbers in the Arctic.

Self-rated health status was also included since it may be related to both residential school status and educational attainment. Respondents indicated on a five-point scale ranging from poor to excellent how they would rate their overall health. The responses were collapsed into good health, which included good, very good and excellent, and poor health, which included fair and poor. Good health was set as the reference category.

Two intervening variables were considered: 1) ability to speak or understand an Aboriginal language; and 2) rating of the accuracy of what was taught about Aboriginal people in school. The Aboriginal language variable was dummy coded into “yes” and “no” with no as the reference. The accuracy of teaching variable was derived from two questions. One asked whether the respondent was being or had been taught about Aboriginal people in school. Respondents who answered “yes” were asked to rate on a Likert scale how accurate what they learned was, ranging from never accurate to usually accurate. The derived variable included three categories: not taught, not accurate, and accurate. Not taught was set as the reference.

### *Analysis*

Hierarchical multinomial logistic regression techniques were used for the multivariate analyses since the data violated the test of parallel lines assumption for

ordinal regression  $\chi^2(11) = 363.44, p < .001$ . In accordance with Statistics Canada requirements, bootstrap survey weights<sup>22</sup> ( $N = 500$ ) were used in all data analyses. These weights allow the complex survey design to be taken into account when calculating variances. The analyses also make use of sample weights, which adjust the sample to reflect the population from which it was drawn (Statistics Canada, n.d.-a). Analyses were carried out using the “svy” commands in Stata 10 (StataCorp, 2007).

At the time of writing, model fit statistics for survey weighted multinomial regression models had not been developed<sup>23</sup> (Heeringa, West, & Berglund, 2010). The fitted model is evaluated using multiparameter Adjusted Wald tests of the overall significance of each of the predictors, which tests the null hypothesis that all parameters

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<sup>22</sup> “The bootstrap variance estimate (the variance is a particular measure of sampling error) was calculated as the empirical variance of the  $M$  estimates. For each subsample, the initial weights first had to be adjusted for bootstrap subsampling which produces what is called ‘initial bootstrap weights’. These initial bootstrap weights were then adjusted as described previously to obtain the final weights for each subsample. In other words, adjustments for individuals either missed or sampled by mistake, nonresponse and post-stratification were done for each subsample in almost exactly the same way as the full sample” (Statistics Canada, n.d.-a, p. 4).

<sup>23</sup> “When used with independently distributed, nonweighted data, the likelihood to be maximized reflects the joint probability distribution of the data given the chosen model. With complex survey data, however, this interpretation of the likelihood is no longer valid, because survey data are weighted, not independently distributed, or both. Yet for survey data, (valid) parameter estimates for a given model can be obtained using the associated likelihood function with appropriate weighting. Because the probabilistic interpretation no longer holds, the likelihood here is instead called *pseudolikelihood*, but likelihood-ratio tests are no longer valid” (StataCorp, 2009, p. 76)

associated with a predictor are not significantly different from zero (Heeringa et al., 2010).

Analyses showed no collinearity between independent variables. There were, however, a significant number of cases with missing data. There were 3,630 complete cases (61.6%) in the 25 to 34 cohort, 4,060 (64.9%) in the 35 to 44 cohort, and 2,720 (68.9%) in the 45 to 54 cohort. Particularly problematic were the residential school variables with 28.2% ( $n = 4,540$ ) missing on proximity and 39.2% ( $n = 6,310$ ) missing on density. Missing cases analyses showed that there were associations between having complete or missing data on the variables in the regression models and education  $F(1.96, 979.92) = 10.14, p < .001$ , residential school proximity  $F(2.51, 1,251.35) = 87.66, p < .001$ , age cohort  $F(1.99, 992.60) = 3.93, p = .02$ , community type  $F(1, 499) = 3.94, p = .04$ , and accuracy of teaching about Aboriginal peoples in school  $F(1.98, 988.81) = 3.64, p < .03$ . A higher proportion of respondents with post-secondary or high school had complete data compared to those with less than high school. The lowest rates of complete data were among respondents who attended residential school or had a parent who attended respectively. Older cohorts were more likely to have complete data than younger ones. Those living on reserve were more likely to be missing data than respondents living off reserve. Finally, among responses to questions about the accuracy of teaching about Aboriginal peoples in school, the highest percentage of complete cases were in the not accurate category and about the same percentage were in the not taught and accurate categories.

Data were imputed using the imputation by chained equations (ICE) package for Stata<sup>24</sup> (Royston, 2010), which uses the fully conditional specification (FCS) approach to multiple imputation. Five imputed data sets were created and analyzed using the *mim* package for Stata 10 (Galati, Royston, & Carlin., 2010). Since complete cases analyses may be biased and imputed data represents a best guess as to what missing values might be, both sets of results are reported.

Due to the potential for cohort effects and correlation between age and residential school experience, each age cohort was analyzed separately. Hierarchical regression was used to see how the relationship between intergenerational residential school attendance and educational attainment is affected by other factors. The results present the base model with only residential school proximity or density, as well as the full model with all control variables added. Additional models testing conditional effects using interaction terms between residential school proximity or density and ability to speak an Aboriginal language and ratings of the accuracy of teaching about Aboriginal peoples in school were also included.

## Results

### *Descriptives*

Table 1 shows that educational attainment has increased across cohorts. The percentage without a high school diploma is nearly three times higher in the oldest cohort

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<sup>24</sup> ICE imputes using a series of univariate regressions with the other variables in the model as predictors. An advantage of this approach is that no assumptions about the variables having a multivariate normal distribution are made, which enables the imputation of categorical and continuous data. It also supports the use of survey weights (StataCorp, 2009).

Table 1

## Survey Weighted Sample Descriptives by Cohort

	25-34		35-44		45-54		55-64		65+	
	UI	I	UI	I	UI	I	UI	I	UI	
<b>Educational attainment</b>										
Less than high school	1,580 (26.8)	1,630 (27.7)	1,850 (29.6)	1,890 (30.2)	1,220 (30.9)	1,260 (31.9)	1,080 (52.4)	1,100 (53.4)	1,080 (76.6)	1,100 (78.0)
High school	2,330 (39.6)	2,380 (40.4)	2,050 (32.7)	2,090 (33.4)	1,250 (31.6)	1,280 (32.4)	390 (18.9)	410 (19.9)	120 (8.5)	130 (9.2)
Post-secondary	1,840 (31.2)	1,880 (31.9)	2,230 (35.6)	2,270 (36.3)	1,380 (34.9)	1,410 (35.7)	550 (26.7)	550 (26.7)	180 (12.8)	180 (12.8)
Missing	140 (2.4)	-	130 (2.1)	-	100 (2.5)	-	40 (1.9)	-	30 (2.1)	-
<b>Intergenerational proximity to residential school</b>										
Self	320 (5.4)	440 (7.5)	670 (10.7)	830 (13.3)	740 (18.7)	860 (21.8)	480 (23.3)	620 (30.1)	360 (25.5)	580 (41.1)
Parent	1,790 (30.4)	2,320 (39.4)	1,580 (25.2)	2,040 (32.6)	690 (17.5)	890 (22.5)	250 (12.1)	330 (16.0)	160 (11.3)	230 (16.3)
Grandparent	400 (6.8)	600 (10.2)	280 (4.5)	410 (6.5)	130 (3.3)	200 (5.1)	40 (1.9)	50 (2.4)	10 (0.7)	20 (1.4)

	25-34		35-44		45-54		55-64		65+	
	UI	I	UI	I	UI	I	UI	I	UI	
No history	1,540 (26.1)	2,540 (43.1)	1,980 (31.6)	2,990 (47.8)	1,450 (36.7)	2,000 (50.6)	840 (40.8)	1,060 (51.5)	390 (27.7)	590 (41.8)
Missing	1,840 (31.2)	- -	1,760 (28.1)	- -	940 (23.8)	- -	470 (22.8)	- -	480 (34.0)	- -
Intergenerational density of residential school exposure										
One generation	1,020 (17.3)	1,780 (30.2)	930 (14.9)	1,650 (26.4)	630 (15.9)	1,040 (26.3)	290 (14.1)	520 (25.2)	190 (13.5)	450 (31.9)
Two generations	760 (12.9)	1,320 (22.4)	720 (11.5)	1,270 (20.3)	340 (8.6)	670 (17.0)	160 (7.8)	340 (16.5)	90 (6.4)	290 (20.6)
Three generations	90 (1.5)	260 (4.4)	190 (3.0)	350 (5.6)	160 (4.1)	250 (6.3)	90 (4.4)	140 (6.8)	40 (2.8)	80 (5.7)
No intergenerational history	1,540 (26.1)	2,530 (43.0)	1,980 (31.6)	2,990 (47.8)	1,450 (36.7)	2,000 (50.6)	840 (40.8)	1,060 (51.4)	390 (27.7)	590 (41.8)
Missing	2,480 (42.1)	- -	2,450 (39.1)	- -	1,380 (34.9)	- -	690 (33.5)	- -	700 (49.6)	- -

		25-34		35-44		45-54		55-64		65+	
		UI	I	UI	I	UI	I	UI	I	UI	
<b>Sex</b>											
Male		2,540 (43.1)		2,880 (46.0)		1,750 (44.3)		990 (48.1)		660 (46.8)	
Female		3,350 (56.9)		3,380 (54.0)		2,200 (55.7)		1,080 (52.4)		750 (53.2)	
<b>Registered Indian Status</b>											
Status		4,090 (69.4)	4,140 (70.3)	4,130 (66.0)	4,180 (66.8)	2,490 (63.0)	2,520 (63.8)	1,470 (71.4)	1,480 (71.8)	1,040 (73.8)	1,070 (75.9)
Non-Status		1,690 (28.7)	1,750 (29.7)	2,040 (32.6)	2,080 (33.2)	1,400 (35.4)	1,430 (36.2)	570 (27.7)	580 (28.2)	310 (22.0)	340 (24.1)
Missing		100 (1.7)	-	90 (1.4)	-	60 (1.5)	-	20 (1.0)	-	60 (4.3)	-
<b>Location</b>											
Off reserve		4,630 (78.6)		5,080 (81.2)		3,240 (82.0)		1,620 (78.6)		1,040 (73.8)	
On reserve		1,260 (21.3)		1,180 (18.8)		710 (18.0)		440 (21.4)		370 (26.2)	
<b>Region</b>											
Rural or Arctic		2,110 (35.8)		2,130 (34.0)		1,430 (36.2)		890 (43.2)		630 (44.7)	

	25-34		35-44		45-54		55-64		65+	
	UI	I	UI	I	UI	I	UI	I	UI	
Urban	3,780 (64.2)		4,130 (66.0)		2,520 (63.8)		1,170 (56.8)		780 (55.3)	
Self-Rated Health										
Poor	630 (10.7)	640 (10.9)	1,130 (18.1)	1,140 (18.2)	1,140 (28.9)	1,150 (29.1)	790 (38.3)	790 (38.3)	660 (46.8)	660 (46.8)
Good	5,220 (88.6)	5,250 (89.1)	5,100 (81.5)	5,120 (81.8)	2,770 (70.1)	2,800 (70.9)	1,260 (61.2)	1,270 (61.7)	740 (52.5)	750 (53.2)
Missing	40 (0.7)	- -	30 (0.5)	- -	30 (0.8)	- -	10 (0.5)	- -	10 (0.7)	- -
Understand or speak Aboriginal language										
Speaker	2,340 (39.7)	2,360 (40.1)	2,490 (39.8)	2,510 (40.1)	1,620 (41.0)	1,620 (41.0)	1,020 (49.5)	1,030 (50.0)	770 (54.6)	770 (54.6)
Non-speaker	3,510 (59.6)	3,530 (59.9)	3,700 (59.1)	3,750 (59.9)	2,320 (58.7)	2,330 (59.0)	1,020 (49.5)	1,030 (50.0)	640 (45.4)	640 (45.4)
Missing	40 (0.7)	- -	70 (1.1)	- -	20 (0.5)	- -	20 (1.0)	- -	0 (0.0)	- -



	25-34		35-44		45-54		55-64		65+	
	UI	I	UI	I	UI	I	UI	I	UI	
Teaching about Aboriginal peoples										
Not taught	2,140 (36.3)	2,420 (41.1)	3,090 (49.4)	3,420 (54.6)	2,420 (61.3)	2,680 (67.8)	1,410 (68.4)	1,600 (77.7)	940 (66.7)	1,230 (87.2)
Not accurate	620 (10.5)	690 (11.7)	790 (12.6)	870 (13.9)	400 (10.1)	460 (11.6)	150 (7.3)	170 (8.3)	70 (5.0)	90 (6.4)
Accurate	2,460 (41.7)	2,780 (47.2)	1,780 (28.4)	1,970 (31.5)	740 (18.7)	810 (20.5)	260 (12.6)	290 (14.1)	90 (6.4)	100 (7.1)
Missing	660 (11.2)	-	600 (9.6)	-	390 (9.9)	-	250 (12.1)	-	310 (22.0)	-
Total N	5,890	5,890	6,260	6,260	3,950	3,950	2,060	2,060	1,410	1,410

*Note.* In accordance with Statistics Canada guidelines for post-censal surveys, frequencies have been rounded to the nearest unit of 10.

Percentages have been calculated based on rounded values. UI = unimputed data. I = imputed data.

compared to the youngest. Similarly, the percentage with post-secondary is almost three times higher in the youngest cohort compared to the oldest. The largest jump in educational attainment between cohorts occurs between the 45 to 54 and 55 to 64 cohorts, which may be explained by the fact that the former were born in the prosperous post-World War II era. The data for intergenerational proximity to residential school shows that persons from oldest cohorts were most likely to have attended residential school themselves. A higher percentage of respondents in the younger cohorts had a parent or grandparent as the closest generation attending. However, in every cohort the highest proportion of respondents had no intergenerational history of residential school. In terms of density, there is less variation by cohort. The largest proportion had no intergenerational history. It was relatively rare to have three generations attending.

The sample included a larger proportion of female respondents compared to males. The majority had Registered Indian Status with the lowest rates among those aged 45 to 54. In addition, the majority were living off reserve and in an urban setting at the time of the survey. Those in the oldest cohorts were slightly more likely to live in a rural or Arctic location. The relationship between health and age is evident in these data with the rate of poor health jumping from around 10% among those aged 25 to 34 to 46% among those aged 65 and over. Data show that the ability to speak an Aboriginal language has declined slightly over time. It is also clear that learning about Aboriginal people in school is much more common among younger cohorts. However, among those who reported learning about Aboriginal peoples in school, more respondents rated what they learned as being accurate, as opposed to inaccurate, in all cohorts.

### *Proximity Models*

*25 to 34 age cohort.* Multinomial regression analyses (Table 2) show that there are no significant differences in the odds of having less than high school compared to high school by residential school proximity with or without controls in the 25 to 34 age cohort. Among the control variables, males had higher odds of having less than high school compared to females although the difference was only significant in the imputed data. There were no significant differences in odds between Status and non-Status Indians, or those who live in urban or rural and Arctic regions. However, those who lived on reserve had approximately one-and-a-half times higher odds of having less than high school compared to those living off reserve. Those who rated their health as poor had twice the odds of those in good health to have not completed high school. Respondents who spoke an Aboriginal language had around one-and-a-half times higher odds compared to non-speakers of having less than high school relative to high school. Finally, compared to those who were not taught, those who were taught about Aboriginal peoples in school, whether they believed it was accurate or inaccurate, were significantly less likely to have not graduated from high school.

Results comparing the odds of having post-secondary relative to high school among the 25 to 34 age cohort showed that those who attended residential school or had a parent who attended were significantly less likely than those with no intergenerational history to have post-secondary credentials in the unimputed base model. The effect remained significant at the .10 level among those in the self category after controls were added, but the effect for those in the parent category became non-significant. There was no significant difference between those who had a grandparent who attended compared to

Table 2

## Hierarchical Multinomial Regression Analysis Predicting Educational Attainment by Residential School Proximity

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
25 - 34 cohort								
Residential school proximity								
Self	1.21 (0.25)	1.30 (0.28)	1.00 (0.21)	0.94 (0.19)	0.50** (0.12)	0.62 (0.19)	0.63† (0.16)	0.73 (0.23)
Parent	1.02 (0.19)	1.04 (0.18)	0.90 (0.17)	0.85 (0.15)	0.72† (0.13)	0.77 (0.16)	0.83 (0.16)	0.85 (0.20)
Grandparent	0.64 (0.21)	0.70 (0.23)	0.72 (0.24)	0.74 (0.23)	1.06 (0.29)	1.18 (0.31)	1.09 (0.31)	1.19 (0.31)
No history	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Sex								
Male			1.15 (0.16)	1.37* (0.17)			0.81 (0.13)	0.93 (0.12)
Female			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Registered Indian Status								
Status			1.09 (0.32)	1.04 (0.23)			0.86 (0.19)	0.90 (0.17)

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Non-Status Community type			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Reserve			1.58* (0.32)	1.56** (0.24)			0.82 (0.14)	0.73* (0.11)
Non-reserve			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community region								
Urban			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Rural or Arctic			1.11 (0.22)	1.14 (0.19)			0.75 (0.15)	0.82 (0.15)
Self-rated health								
Poor			2.11** (0.52)	2.00** (0.41)			0.68 (0.25)	0.65 (0.19)
Good			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Ability to speak Aboriginal language								
Speaker			1.43* (0.21)	1.57*** (0.19)			0.86 (0.13)	0.94 (0.13)
Non-speaker			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>

Independent Variables	< High school				Post-secondary				
	Base		Full		Base		Full		
	UI	I	UI	I	UI	I	UI	I	
Accuracy of teaching about Aboriginal peoples									
Not taught			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>	
Not accurate			0.40 <sup>***</sup> (0.08)	0.40 <sup>***</sup> (0.07)			1.02 (0.22)	0.89 (0.18)	
Accurate			0.61 <sup>**</sup> (0.09)	0.58 <sup>***</sup> (0.08)			1.03 (0.16)	0.96 (0.14)	
35 - 44 cohort									
Residential school proximity									
Self	1.05 (0.25)	1.14 (0.27)	0.76 (0.19)	0.85 (0.21)	0.73 (0.16)	0.85 (0.21)	0.82 (0.21)	0.97 (0.28)	
Parent	0.70 <sup>†</sup> (0.14)	0.78 (0.18)	0.58 <sup>*</sup> (0.13)	0.68 (0.16)	0.67 <sup>*</sup> (0.13)	0.76 (0.19)	0.74 (0.15)	0.82 (0.23)	
Grandparent	0.67 (0.35)	0.83 (0.40)	0.41 <sup>*</sup> (0.19)	0.91 (0.44)	0.80 (0.32)	1.02 (0.33)	0.72 (0.30)	0.99 (0.32)	
No history	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	
Sex									
Male			1.55 <sup>*</sup> (0.30)	1.62 <sup>**</sup> (0.25)			1.07 (0.19)	1.00 (0.15)	

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Female				<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Registered Indian Status								
Status			0.98 (0.30)	0.89 (0.21)			0.79 (0.19)	0.81 (0.17)
Non-Status			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community type								
Reserve			1.38* (0.23)	1.74*** (0.25)			0.84 (0.14)	1.01 (0.15)
Non-reserve			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community region								
Urban			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Rural or Arctic			1.39 <sup>†</sup> (0.27)	1.22 (0.22)			1.35 <sup>†</sup> (0.24)	1.06 (0.17)
Self-rated health								
Poor			1.37 (0.34)	1.35 (0.29)			0.64 <sup>†</sup> (0.15)	0.68 <sup>†</sup> (0.14)
Good			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>

Independent Variables	< High school				Post-secondary				
	Base		Full		Base		Full		
	UI	I	UI	I	UI	I	UI	I	
Ability to speak Aboriginal language									
Speaker			1.08 (0.20)	1.23 (0.21)			0.97 (0.17)	0.98 (0.14)	
Non-speaker			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>	
Accuracy of teaching about Aboriginal peoples									
Not taught			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>	
Not accurate			0.29*** (0.08)	0.30*** (0.09)			1.56 <sup>†</sup> (0.38)	1.10 (0.24)	
Accurate			0.72 (0.16)	0.80 (0.15)			1.12 (0.22)	1.08 (0.18)	
45 – 54 cohort									
Residential school proximity									
Self	1.17 (0.26)	1.22 (0.27)	0.55* (0.14)	0.57 <sup>†</sup> (0.17)	0.74 (0.16)	0.81 (0.20)	0.52* (0.13)	0.74 (0.25)	
Parent	0.88 (0.24)	1.14 (0.60)	0.60 <sup>†</sup> (0.18)	0.77 (0.30)	0.54* (0.14)	0.81 (0.61)	0.42** (0.12)	0.71 (0.51)	
Grandparent	0.67	0.49	0.75	0.63	0.77	0.82	0.67	0.78	



Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
	(0.39)	(0.32)	(0.45)	(0.40)	(0.43)	(0.61)	(0.38)	(0.66)
No history	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Sex								
Male			0.94 (0.20)	1.13 (0.26)			1.01 (0.20)	1.36 (.61)
Female			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Registered Indian Status								
Status			1.61 (0.56)	1.92 <sup>†</sup> (0.62)			1.13 (0.35)	1.24 (0.38)
Non-Status			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community type								
Reserve			1.18 (0.25)	1.02 (0.43)			0.92 (0.18)	0.89 (0.17)
Non-reserve			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community region								
Urban			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Rural or Arctic			1.83 <sup>*</sup>	1.85 <sup>†</sup>			1.32	1.14

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Self-rated health			(0.51)	(0.58)			(0.32)	(0.40)
Poor			1.60 <sup>†</sup> (0.44)	1.47 (0.37)			0.74 (0.20)	0.74 (0.24)
Good			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Ability to speak Aboriginal language								
Speaker			1.32 (0.30)	1.62 (0.57)			1.32 (0.31)	1.04 (0.39)
Non-speaker			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Accuracy of teaching about Aboriginal peoples								
Not taught			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Not accurate			0.48 <sup>†</sup> (0.19)	0.38 <sup>*</sup> (0.14)			1.69 <sup>†</sup> (0.53)	1.24 (0.47)
Accurate			0.56 <sup>†</sup> (0.17)	0.57 <sup>†</sup> (0.17)			0.95 (0.28)	1.04 (0.36)

*Note.* Odds ratios with standard errors in parentheses. Reference category is high school graduate. UI = unimputed. I = imputed.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$

those with no history in any of the models. There were no significant differences by gender, Registered Indian Status, or community region. Those who lived on reserve had significantly lower odds of having post-secondary compared to their off reserve counterparts in the imputed model. There were no significant differences by health status, Aboriginal language, and accuracy of teaching about Aboriginal peoples.

Adjusted multiparameter Wald tests were significant for residential school proximity without controls using unimputed data  $F(6, 494) = 3.33, p = .003$ . However, the addition of controls reduced it to non-significant levels  $F(6, 494) = 1.20, p = .30$  for unimputed models and  $F(3, 52.5) = 0.47, p = .70$  for imputed. Among the control variables, the test for community type was significant  $F(2, 498) = 5.06, p = .006$  in the unimputed model and  $F(1, 4311.8) = 8.16, p = .004$  in the imputed, as was self-rated health  $F(2, 498) = 7.87, p < .001$  and  $F(1, 36788.1) = 10.49, p = .001$  respectively. Ability to speak an Aboriginal language was significant in both the unimputed  $F(2, 498) = 5.12, p = .006$  and imputed models  $F(1, 29503.4) = 13.66, p < .001$ . Accuracy of teaching about Aboriginal peoples was also significant in both sets of models  $F(4, 496) = 7.48, p < .001$  and  $F(2, 1605.1) = 15.17, p < .001$ . The test for sex was significant in the imputed model only  $F(1, 350908.8) = 6.67, p = .01$ .

*35 to 44 age cohort.* Proximity models for the 35 to 44 age cohort showed no differences in educational attainment between those who attended residential school and those with no intergenerational history for both less than high school relative to high school and post-secondary relative to high school. Unexpectedly, those who had a parent who attended had *lower* odds of having less than high school relative to those with no history both with and without controls in the unimputed models. In addition, the

coefficient for grandparent relative to no history becomes significant with the addition of controls for the less than high school versus high school contrast, which suggests suppressor effects (Menard, 2002). The odds ratio becomes significant after adding controls for ability to speak an Aboriginal language and accuracy of teaching about Aboriginal peoples. Among the control variables, males had higher odds of being high school non-graduates compared to females in both the unimputed and imputed models. Compared to those living off reserve, those living on reserve had higher odds of having less than high school relative to high school. In the unimputed model, those living in rural or Arctic areas had significantly higher odds of having less than high school compared to those in urban areas. There were no significant differences in the odds of having less than high school relative to high school by Registered Indian Status, self-rated health, and ability to speak an Aboriginal language. Compared to those who were not taught about Aboriginal peoples in school, those who deemed what they learned to be inaccurate had lower odds of having less than high school.

In models comparing post-secondary to high school, the odds ratio for respondents who had a parent attend relative to those with no history was significant in the unimputed base model, indicating lower relative odds of having post-secondary credentials. The difference became non-significant with the addition of controls. There were no significant differences by sex, Registered Indian Status, community type, or ability to speak an Aboriginal language. Interestingly, the odds of having post secondary were significantly higher among those in rural and Arctic regions compared to those in urban areas in the unimputed model. Those who rated their health as poor were less likely to have post-secondary relative to those in good health. Finally, compared to those who

were not taught about Aboriginal people in school, those who said what they learned was inaccurate were more likely to have post-secondary relative to high school, but the difference was only significant in the unimputed model.

The Adjusted Wald test for residential school proximity without controls was significant in the unimputed model  $F(6, 494) = 2.24, p = 0.03$ , but not the imputed  $F(3, 49.8) = 1.12, p = .35$ . In the models with controls, the test for residential school proximity was not significant in either the unimputed  $F(6, 494) = 1.48, p = .18$  or imputed  $F(3, 52.1) = 1.18, p = .33$  models. Among the control variables, the tests for sex were significant in the unimputed  $F(2, 498) = 3.13, p < .04$  and imputed  $F(1, 33458.2) = 9.84, p = .002$  models. The tests for community type were significant in both sets of models  $F(2, 498) = 4.65, p < .01$  and  $F(1, 52945.1) = 14.10, p < .001$  respectively. The test for self-rated health was only significant in the unimputed model  $F(2, 498) = 6.24, p < .002$ . Finally, the test for accuracy of teaching about Aboriginal peoples was significant in both models  $F(4, 496) = 13.08, p < .001$  and  $F(2, 30.0) = 7.84, p = .002$ .

*45 to 54 age cohort.* Among those in the 45 to 54 age cohort, those who attended residential school had lower odds of having less than high school compared to those with no family history after controls were added, which indicates suppressor effects. Those who had a parent who attended also had significantly lower odds compared to those in the no history group in the unimputed model with controls only. Once again, the effects became significant when ability to speak an Aboriginal language and accuracy of teaching about Aboriginal peoples were added to a model that includes all the other controls. Differences by sex, community type, and ability to speak an Aboriginal language were non-significant. Status Indians had higher odds of having less than high

school compared to non-Status Indians, but the difference was significant in the imputed model only. Compared to those in urban areas, those in rural or Arctic locations had significantly higher odds of having less than high school relative to high school. In the unimputed model, those who rated their health as poor were more likely to have less than high school compared to those in good health. Finally, compared to those who were not taught about Aboriginal peoples in school, those who were taught, whether they deemed it accurate or inaccurate, were less likely to have dropped out of high school.

In the models comparing the odds of having post-secondary relative to high school, those who had a parent who attended residential school had lower odds of having post-secondary than those with no history, but the difference was only significant in the unimputed models both with and without controls. Those who attended residential school also had lower odds of having post-secondary, but the difference was only significant in the unimputed model with controls, signalling the presence of suppression. The effect becomes significant at the .10 level after adding controls for Registered Indian Status, community type, and community region to a model that controls for sex. Among the control variables, all of the odds ratios were not significant with the exception of the accuracy of teaching about Aboriginal peoples in school. Compared to those who were not taught anything, those who rated what they learned about Aboriginal peoples in school as being inaccurate were significantly more likely to have post-secondary in the unimputed models.

Adjusted Wald tests for residential school proximity were significant at the .10 level in the unimputed base model  $F(6, 494) = 1.91, p = .08$ , but not in the imputed base model  $F(3, 42.3) = 0.58, p = .63$  or either of the full models  $F(6, 494) = 1.71, p = .12$

unimputed and  $F(3, 39.8) = 1.16, p = .34$  imputed. The test for Registered Indian Status was significant in the imputed model  $F(1, 50.0) = 4.00, p = .05$ . Community region was a significant predictor of educational attainment in both the unimputed  $F(2, 498) = 2.46, p = .09$  and imputed  $F(1, 190.1) = 3.93, p = .05$  models. Self-rated health was significant in the unimputed model  $F(2, 498) = 5.22, p = .006$  only. Finally, the accuracy of teaching about Aboriginal peoples in school was significant in both the unimputed  $F(4, 496) = 3.48, p = .008$  and imputed  $F(2, 410.5) = 4.53, p = .01$  models.

#### *Conditional Effects on Residential School Proximity*

Table 3 presents the conditional effects of speaking an Aboriginal language and accuracy of teaching about Aboriginal peoples in school on the odds of educational attainment by residential school proximity for each cohort. The addition of interaction terms to the model changes the interpretation of coefficients for residential school proximity and Aboriginal language or accuracy of teaching. These coefficients no longer represent main effects, but rather conditional effect for the reference category on the other variable in the interaction. The product terms are ratios of predicted odds ratios (Jaccard, 2001). Odds ratios are calculated for a particular category of residential school proximity or density relative to the reference category within each category of the moderating variable. This odds ratio is then divided by the odds ratio for residential proximity or density for the reference category of the moderating variable. For example, the odds for self are divided by the odds for no history for those who speak an Aboriginal language. Then the odds for self are divided by the odds for no history for those who do not speak an Aboriginal language. The resulting odds ratio for speakers is divided by the odds ratio for non-speakers.

Table 3

## Conditional Effects of Residential School Proximity on Educational Attainment

		< High school		Post-secondary	
		UI	I	UI	I
25-34 cohort					
Residential school proximity x Aboriginal language					
Predictors					
Self x non-speaker		1.29 (0.47)	1.12 (0.44)	0.52 (0.21)	0.64 (0.37)
Parent x non-speaker		1.67 <sup>†</sup> (0.48)	1.22 (0.37)	0.89 (0.22)	0.92 (0.28)
Grandparent x non-speaker		0.84 (0.31)	0.79 (0.35)	1.20 (0.51)	1.28 (0.45)
No history x speaker		3.08 <sup>***</sup> (0.92)	2.41 <sup>**</sup> (0.67)	0.96 (0.27)	1.07 (0.34)
Self x speaker		0.50 (0.22)	0.65 (0.29)	1.26 (0.59)	1.13 (0.92)
Parent x speaker		0.27 <sup>***</sup> (0.09)	0.45 <sup>*</sup> (0.17)	0.85 (0.28)	0.81 (0.35)
Grandparent x speaker		0.59 (0.35)	0.75 (0.42)	0.77 (0.46)	0.77 (0.40)
Residential school proximity x accuracy of teaching about Aboriginal peoples in school					
Predictors					
Self x not taught		0.52 <sup>*</sup> (0.15)	0.62 <sup>†</sup> (0.16)	0.43 <sup>*</sup> (0.16)	0.54 <sup>†</sup> (0.19)
Parent x not taught		0.68 <sup>†</sup> (0.16)	0.72 (0.15)	0.65 (0.18)	0.71 (0.22)



	< High school		Post-secondary	
	UI	I	UI	I
Grandparent x not taught	0.57* (0.16)	0.61 (0.35)	1.22 (0.50)	0.95 (0.41)
No history x not accurate	0.38† (0.19)	0.37* (0.15)	0.68 (0.35)	0.61 (0.26)
No history x accurate	0.37** (0.12)	0.46* (0.14)	0.85 (0.25)	0.82 (0.20)
Self x not accurate	2.11 (1.39)	1.81 (0.96)	0.97 (0.68)	1.04 (0.81)
Parent x not accurate	1.06 (0.57)	1.09 (0.51)	2.28 (1.28)	2.02 (1.07)
Grandparent x not accurate	0.67 (0.57)	1.02 (0.86)	0.98 (0.81)	1.61 (1.21)
Self x accurate	4.22** (1.76)	2.37† (1.05)	2.65* (1.27)	2.00 (1.15)
Parent x accurate	1.91† (0.73)	1.38 (0.51)	1.30 (0.46)	1.22 (0.43)
Grandparent x accurate	1.96 (1.33)	1.47 (1.14)	0.89 (0.55)	1.38 (0.85)

35 - 44  
cohort

Residential school proximity x  
Aboriginal language

Predictors

Self x non-speaker	0.96 (0.36)	1.04 (0.37)	0.59 (0.22)	0.86 (0.43)
Parent x non-speaker	0.67 (0.22)	0.74 (0.22)	0.70 (0.20)	0.77 (0.28)
Grandparent x non-speaker	0.46 (0.26)	1.07 (0.67)	0.70 (0.36)	0.99 (0.15)

		< High school		Post-secondary	
		UI	I	UI	I
	No history x speaker	1.31 (0.42)	1.43 (0.42)	0.83 (0.27)	0.88 (0.23)
	Self x speaker	0.68 (0.31)	0.72 (0.31)	1.70 (0.82)	1.24 (0.73)
	Parent x speaker	0.74 (0.31)	0.80 (0.30)	1.21 (0.48)	1.19 (0.43)
	Grandparent x speaker	0.69 (0.48)	0.57 (0.43)	1.18 (0.80)	1.05 (0.62)
<hr/>					
Residential school proximity x accuracy of teaching about Aboriginal peoples in school					
Predictors					
	Self x not taught	0.95 (0.27)	1.07 (0.25)	0.99 (0.27)	1.12 (0.33)
	Parent x not taught	0.55* (0.16)	0.69 (0.18)	0.64† (0.17)	0.74 (0.21)
	Grandparent x not taught	0.36† (0.22)	0.83 (0.44)	0.75 (0.41)	1.01 (0.44)
	No history x not accurate	0.34† (0.19)	0.30† (0.19)	2.15 (1.00)	1.13 (0.50)
	No history x accurate	0.68 (0.28)	0.88 (0.28)	0.89 (0.31)	1.00 (0.27)
	Self x not accurate	0.41 (0.36)	0.61 (0.49)	0.26† (0.20)	0.49 (0.35)
	Parent x not accurate	1.05 (0.66)	1.16 (0.86)	0.81 (0.47)	1.20 (0.80)
	Grandparent x not accurate	1.01 (1.71)	1.37 (2.22)	0.81 (0.70)	1.26 (1.07)
	Self x accurate	0.74	0.58	1.35	0.99

	< High school		Post-secondary	
	UI	I	UI	I
	(0.35)	(0.31)	(0.63)	(0.51)
Parent x accurate	1.27 (0.63)	0.88 (0.40)	1.87 (0.84)	1.36 (0.53)
Grandparent x accurate	1.30 (1.09)	0.88 (0.98)	0.92 (0.73)	0.80 (0.53)

45 – 54  
cohort

Residential school proximity x  
Aboriginal language

Predictors

Self x non-speaker	0.57 (0.23)	0.55 (0.21)	0.68 (0.29)	0.84 (0.38)
Parent x non-speaker	0.55 (0.22)	0.71 (0.30)	0.34** (0.14)	0.72 (0.68)
Grandparent x non-speaker	0.72 (0.74)	0.57 (0.65)	0.86 (0.66)	0.89 (0.92)
No history x speaker	1.24 (0.43)	1.54 (0.49)	1.36 (0.54)	1.30 (0.44)
Self x speaker	1.00 (0.49)	1.06 (0.52)	0.69 (0.37)	0.73 (0.37)
Parent x speaker	1.21 (0.64)	1.09 (1.02)	1.41 (0.78)	0.79 (0.74)
Grandparent x speaker	0.94 (1.12)	1.16 (1.57)	0.29 (0.29)	0.52 (0.64)

Residential school proximity x  
accuracy of teaching about  
Aboriginal peoples in school

Predictors

Self x not taught	0.61 <sup>†</sup> (0.17)	0.61 <sup>†</sup> (0.15)	0.52* (0.15)	0.63 (0.20)
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	< High school		Post-secondary	
	UI	I	UI	I
Parent / grandparent x not taught <sup>a</sup>	1.07 (0.33)	0.97 (0.28)	0.74 (0.23)	0.78 (0.27)
No history x not accurate	0.93 (0.65)	0.63 (0.39)	1.98 (0.98)	1.49 (0.76)
No history x accurate	0.91 (0.47)	0.80 (0.33)	1.38 (0.62)	1.22 (0.45)
Self x not accurate	1.27 (0.96)	1.32 (0.97)	2.27 (1.38)	2.01 (1.35)
Parent / grandparent x not accurate	0.07** (0.06)	0.16* (0.13)	0.41 (0.28)	0.55 (0.39)
Self x accurate	0.75 (0.48)	0.84 (0.49)	0.89 (0.52)	0.97 (0.52)
Parent / grandparent x accurate	0.26 <sup>†</sup> (0.21)	0.37 (0.24)	0.31 (0.22)	0.50 (0.35)

*Note.* Odds ratios with standard errors in parentheses. Reference category is high school graduate. Models include controls for sex, Registered Indian Status, community type, community region, self-rated health, ability to speak an Aboriginal language, and accuracy of teaching about Aboriginal peoples in school. UI = unimputed. I = imputed.

<sup>a</sup> Parent and grandparent categories were combined due to small cell sizes when interaction with accuracy of teaching added.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

*25 to 34 cohort.* In the 25 to 34 age cohort, among those who do not speak an Aboriginal language, those who had a parent who attended residential school had 1.67 times higher odds of having less than high school compared to those with no family history in the unimputed model. Among those with no history, those who speak an Aboriginal language have between 2.4 and three times higher odds of having less than high school relative to those with no history who do not speak an Aboriginal language. The odds of having less than high school were smaller for those who had a parent who attended residential school relative to those with no history among speakers than non-speakers. There were no significant differences in odds for post-secondary compared to high school. The Adjusted Wald test for all parameters related to the interaction was significant in the unimputed  $F(14, 486) = 2.91, p < .001$  and imputed  $F(7, 231.9) = 2.89, p = .007$  models.

Models examining the accuracy of teaching as a moderator show that, among those who were not taught about Aboriginal people in school, those with a personal or family residential school history had lower odds of having less than high school compared to those with no history. The difference in odds was only significant among those who attended themselves in the imputed model. Among those with no history of residential school attendance, those who were taught about Aboriginal people, whether deemed accurate or inaccurate, had lower odds of having less than high school relative to high school. There were no significant differences by residential school proximity among those who said what they learned was inaccurate compared to those who were not taught. The odds ratio for those who attended residential school relative to those with no history

was larger among those who rated what they learned about Aboriginal people to be accurate compared to those who were not taught in both the unimputed and imputed models. The same relationship was found in the interaction between parent and accurate, but the ratio was only significant in the unimputed model.

Among those who were not taught about Aboriginal people in school, those who attended residential school had lower odds of having post-secondary compared to those with no history. In addition, the odds ratio for those who attended residential school relative to those with no history was larger for those who rated what they learned as being accurate compared to those who were not taught. The ratio was only significant in the unimputed models. The Adjusted Wald test for all parameters associated with the interaction was significant in the unimputed  $F(22, 478) = 3.63, p < .001$  and imputed  $F(11, 332.6) = 3.04, p < .001$  models.

*35 to 44 cohort.* In the 35 to 44 cohort, there were no significant differences in the odds of having less than high school versus high school or post-secondary versus high school by residential school proximity and Aboriginal language. The Adjusted Wald test was non-significant  $F(14, 486) = 1.44, p = .13$  unimputed and  $F(7, 326.9) = 0.98, p = .45$  imputed.

Among those who were not taught about Aboriginal people in school, those who had a parent or grandparent who attended were significantly less likely to have less than high school compared to those with no history in the unimputed models. Among those with no history of residential school attendance, those who said what they learned was not accurate were less likely than those who were not taught to have less than high school. There were no significant differences for the product terms.

Those who were not taught about Aboriginal people in school and had a parent who attended were less likely to have post-secondary compared to those with no history in the unimputed models. The ratio of odds of having post-secondary relative to high school was smaller between those who attended compared to those with no history among the not accurate group than the not taught group in the unimputed model. The Adjusted Wald tests were significant in the unimputed model  $F(22, 478) = 4.30, p < .001$ , as well as the imputed  $F(11, 200.7) = 2.57, p = .005$ .

*45 to 54 cohort.* In the 45 to 54 cohort, there were no significant differences between residential school proximity and speaking an Aboriginal language in the odds of having less than high school compared to high school.

Among non-speakers, those whose parent who attended residential school had significantly lower odds of having post-secondary relative to high school in the unimputed model. Adjusted Wald tests did not reach statistical significance for the unimputed  $F(14, 486) = 1.37, p = .16$  or imputed  $F(7, 179.0) = 1.22, p = .29$  models.

Models examining interactions with the accuracy of teaching about Aboriginal peoples in school showed that, among those who were not taught anything, respondents who attended residential school had lower odds of having less than high school compared to those with no history. The odds ratio between those with a parent or grandparent who attended and those with no history was significantly smaller between those who rated what they learned to be inaccurate compared to those who said they were not taught. The odds ratio between those with a parent or grandparent who attended and those with no history was also smaller among those with rated what they learned to be accurate

compared to those who were not taught. This ratio was only significant in the unimputed model.

Comparing post-secondary to high school, only the odds ratio between those who attended residential school and those with no history who were not taught about Aboriginal people reached statistical significance in the unimputed model only. The Adjusted Wald test was significant in both the unimputed  $F(16, 484) = 4.90, p < .001$  and imputed  $F(8, 681.9) = 4.12, p < .001$  models.

#### *Density Models*

Table 4 presents multinomial regression results for models with residential school density. There was little change in the odds ratios for control variables compared with the proximity models.

*25 to 34 age cohort.* The models comparing the odds of having less than high school compared to high school show suppression effects with the odds ratio between those with two generations of residential school attendees and those no intergenerational history becoming significant in the full unimputed model. The effect becomes significant at the .10 level after adding controls for Registered Indian Status, community type, and community region to a model controlling for sex. Surprisingly, the odds ratio suggests that those with a two generation history are less likely to have dropped out of high school compared to those with no intergenerational history.

The models comparing the odds of having post-secondary compared to high school show lower odds of having post-secondary among those with two and three generation histories compared to those with no intergenerational history in the base unimputed model. The addition of controls reduced the ratios to non-significant levels.



Table 4

## Hierarchical Multinomial Regression Analysis Predicting Educational Attainment by Residential School Density

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
25 - 34 cohort								
Residential school density								
Zero generations	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
One generation	0.98 (0.21)	1.07 (0.18)	0.90 (0.20)	0.92 (0.15)	0.79 (0.16)	0.90 (0.20)	0.87 (0.20)	0.98 (0.22)
Two generations	0.86 (0.17)	0.98 (0.17)	0.69 <sup>†</sup> (0.15)	0.79 (0.14)	0.67* (0.13)	0.75 (0.16)	0.78 (0.16)	0.85 (0.20)
Three generations	0.85 (0.27)	0.88 (0.35)	0.67 (0.22)	0.67 (0.24)	0.55 <sup>†</sup> (0.18)	0.65 (0.37)	0.78 (0.27)	0.76 (0.46)
Sex								
Male			1.16 (0.19)	1.37* (0.17)			0.76 (0.14)	0.92 (0.12)
Female			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Registered Indian Status								
Status			1.21 (0.37)	1.06 (0.23)			0.84 (0.20)	0.87 (.16)

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Non-Status			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community type								
Reserve			1.74*	1.57**			0.87	0.72*
			(0.41)	(0.24)			(0.17)	(0.11)
Non-reserve			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community region								
Urban			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Rural or Arctic			1.10	1.14			0.72	0.82
			(0.25)	(0.19)			(0.17)	(0.15)
Self-rated health								
Poor			2.31**	1.99**			0.63	0.64
			(0.68)	(0.42)			(0.28)	(0.19)
Good			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Ability to speak Aboriginal language								
Yes			1.46*	1.59***			0.87	0.94
			(0.25)	(0.19)			(0.14)	(0.13)

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
No			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Accuracy of teaching about Aboriginal peoples								
Not taught			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Not accurate			0.40 <sup>***</sup> (0.09)	0.40 <sup>***</sup> (0.07)			1.02 (0.25)	0.91 (0.19)
Accurate			0.57 <sup>**</sup> (0.10)	0.58 <sup>***</sup> (0.08)			1.02 (0.17)	0.97 (0.14)
35 - 44 cohort								
Residential school density								
Zero generations	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
One generation	0.71 (0.16)	0.96 (0.20)	0.52 <sup>**</sup> (0.11)	0.85 (0.18)	0.72 (0.15)	0.82 (0.19)	0.78 (0.18)	0.87 (0.22)
Two generations	0.61 <sup>*</sup> (0.15)	0.81 (0.21)	0.48 <sup>*</sup> (0.14)	0.65 (0.19)	0.80 (0.18)	0.84 (0.21)	0.95 (0.21)	0.92 (0.26)
Three generations	0.52 (0.22)	0.70 (0.26)	0.41 <sup>*</sup> (0.16)	0.56 (0.21)	0.46 <sup>*</sup> (0.17)	0.62 (0.24)	0.50 (0.21)	0.68 (0.28)
Sex								
Male			1.86 <sup>**</sup>	1.64 <sup>**</sup>			1.12	1.01

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
			(0.42)	(0.25)			(0.21)	(0.15)
Female			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Registered Indian Status								
Status			0.91 (0.30)	0.89 (0.21)			0.73 (0.18)	0.81 (0.17)
Non-Status			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community type								
Reserve			1.49* (0.29)	1.76*** (0.26)			0.87 (0.16)	1.01 (0.15)
Non-reserve			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community region								
Urban			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Rural or Arctic			1.38 (0.30)	1.21 (0.22)			1.32 (0.25)	1.06 (0.17)
Self-rated health								
Poor			1.30 (0.38)	1.36 (0.29)			0.60 <sup>†</sup> (0.16)	0.68* (0.13)

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Good			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Ability to speak Aboriginal language								
Yes			1.14 (0.24)	1.27 (0.21)			0.96 (0.19)	0.99 (0.15)
No			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Accuracy of teaching about Aboriginal peoples								
Not taught			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Not accurate			0.27*** (0.08)	0.31*** (0.09)			1.45 (0.37)	1.12 (0.24)
Accurate			0.68 (0.17)	0.80 (0.15)			1.07 (0.22)	1.08 (0.18)
45 – 54 cohort								
Residential school density								
Zero generations	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
One generation	0.93 (0.25)	1.12 (0.44)	0.61 <sup>†</sup> (0.18)	0.70 (0.20)	0.67 (0.18)	0.82 (0.38)	0.57 <sup>†</sup> (0.17)	0.73 (0.33)

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Two generations	0.93 (0.34)	1.19 (0.59)	0.55 (0.20)	0.73 (0.34)	0.69 (0.24)	0.90 (0.65)	0.52 <sup>†</sup> (0.19)	0.79 (0.56)
Three generations	0.89 (0.23)	0.89 (0.26)	0.51* (0.15)	0.51* (0.16)	0.82 (0.22)	0.73 (0.24)	0.56 <sup>†</sup> (0.18)	0.69 (0.26)
Sex								
Male			0.85 (0.21)	1.13 (0.26)			0.90 (0.20)	1.37 (0.63)
Female			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Registered Indian Status								
Status			1.47 (0.56)	1.94 <sup>†</sup> (0.66)			1.16 (0.39)	1.26 (0.41)
Non-Status			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community type								
Reserve			1.21 (0.29)	0.97 (0.53)			0.94 (0.20)	0.87 (0.18)
Non-reserve			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Community region								
Urban			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>

Independent Variables	< High school				Post-secondary			
	Base		Full		Base		Full	
	UI	I	UI	I	UI	I	UI	I
Rural or Arctic			1.83 <sup>†</sup> (0.57)	1.88 <sup>†</sup> (0.63)			1.24 (0.32)	1.15 (0.38)
Self-rated health								
Poor			1.26 (0.39)	1.45 (0.37)			0.66 (0.19)	0.74 (0.24)
Good			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Ability to speak Aboriginal language								
Yes			1.26 (0.34)	1.58 (0.54)			1.14 (0.31)	1.03 (0.39)
No			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Accuracy of teaching about Aboriginal peoples								
Not taught			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>
Not accurate			0.58 (0.25)	0.38 <sup>*</sup> (0.15)			1.88 <sup>†</sup> (0.61)	1.24 (0.47)
Accurate			0.64 (0.22)	0.57 <sup>†</sup> (0.17)			0.99 (0.32)	1.06 (0.34)

*Note.* Odds ratios with standard errors in parentheses. Reference category is high school graduate. UI = unimputed. I = imputed.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Adjusted Wald tests were not significant for any of the models.

*35 to 44 age cohort.* The models comparing less than high school to high school indicate those in the two generation category have lower odds of having less than high school compared to those with no history in both the base and full unimputed models. Those in the one and three generation categories also have lower odds of having less than high school relative to those with no history in the full unimputed model, which suggests suppression. Both become significant at the .10 level with the addition of a control variable for sex. The addition of controls for Registered Indian Status, community type, and community region bring the significance level below .03 for both ratios.

The models comparing the odds of having post-secondary relative to high school show only one significant effect. Those with three generations who attended residential school had lower odds of having post-secondary compared to those with no intergenerational history in the unimputed model without controls.

Adjusted Wald tests for density were significant in the unimputed full model  $F(6, 494) = 2.33, p = .03$ , but in none of the other models.

*45 to 54 age cohort.* In the models comparing the odds of having less than high school to high school, those with one generation who attended residential school had lower odds of having less than high school compared to those with no history in the unimputed full model. Those with three generations that attended were also less likely to have less than high school compared to those with no generations attending in both the unimputed and imputed full models. These results suggest suppression effects. The odds for three generations relative to zero generations becomes significant after adding controls for Registered Indian Status, community type, and community region to a model



controlling for sex. The odds for one generation relative to no generations becomes significant after adding controls for ability to speak an Aboriginal language and accuracy of teaching about Aboriginal people to a model with controls for all other variables.

The models comparing the odds of having post-secondary compared to high school show that those with one, two, or three generations who attended have lower odds of post-secondary relative to those with no intergenerational history in the full unimputed models. The odds for one generation become significant after controlling for sex, Registered Indian Status, community type, and community region. The odds for two and three generations become significant when all controls are added to the model.

Adjusted Wald tests for density were not significant in any of the models.

#### *Conditional Effects on Residential School Density*

Table 5 presents the conditional effects of residential school density on educational attainment by ability to speak an Aboriginal language and accuracy of teaching about Aboriginal peoples.

*25 to 34 cohort.* In the 25 to 34 age cohort, those in the zero generation category who spoke an Aboriginal language were more likely to have less than high school compared to high school relative to their counterparts who do not speak an Aboriginal language. On the other hand, the odds ratio for one or two generation attendees relative to those with zero generations was smaller for speakers than non-speakers.

There were no significant differences in the odds of having post-secondary relative to high school by residential school density and ability to speak an Aboriginal language.

The Adjusted Wald test for all parameters related to the interaction was

Table 5

## Conditional Effects of Residential School Density on Educational Attainment

		< High school		Post-secondary	
		UI	I	UI	I
25-34 cohort					
Residential school density x Aboriginal language					
Predictors					
One generation x non-speaker	1.49 (0.47)	1.18 (0.31)	0.89 (0.28)	1.04 (0.29)	
Two generations x non-speaker	1.23 (0.44)	1.11 (0.34)	0.90 (0.27)	0.98 (0.28)	
Three generations x non-speaker	0.85 (0.52)	0.75 (0.50)	0.69 (0.44)	0.75 (0.84)	
Zero generations x speaker	2.89*** (0.87)	2.38** (0.65)	0.97 (0.27)	1.10 (0.34)	
One generation x speaker	0.33** (0.13)	0.54 <sup>†</sup> (0.19)	0.94 (0.38)	0.83 (0.34)	
Two generations x speaker	0.30** (0.13)	0.48 <sup>†</sup> (0.18)	0.73 (0.30)	0.72 (0.30)	
Three generations x speaker	0.53 (0.39)	0.72 (0.54)	1.16 (0.84)	0.96 (1.13)	
Residential school density x accuracy of teaching about Aboriginal peoples in school					
Predictors					
One generation x not taught	0.69 (0.21)	0.80 (0.20)	0.74 (0.25)	0.81 (0.26)	
Two generations x not taught	0.48** (0.11)	0.61* (0.13)	0.59 <sup>†</sup> (0.18)	0.64 (0.22)	
Three generations x not taught	0.35* (0.16)	0.47 <sup>†</sup> (0.18)	0.45 (0.25)	0.57 (0.34)	

	< High school		Post-secondary	
	UI	I	UI	I
Zero generations x not accurate	0.38* (0.19)	0.37* (0.15)	0.67 (0.35)	0.61 (0.26)
Zero generations x accurate	0.38** (0.12)	0.46* (0.14)	0.86 (0.25)	0.81 (0.20)
One generation x not accurate	1.12 (0.73)	1.14 (0.57)	2.08 (1.40)	1.97 (1.23)
Two generations x not accurate	1.18 (0.68)	1.22 (0.60)	1.78 (1.11)	1.95 (1.09)
Three generations x not accurate	1.39 (1.17)	1.25 (1.06)	0.76 (1.23)	1.14 (1.20)
One generation x accurate	1.75 (0.81)	1.27 (0.54)	1.13 (0.52)	1.21 (0.46)
Two generations x accurate	2.23 <sup>†</sup> (0.96)	1.68 (0.70)	1.51 (0.59)	1.53 (0.61)
Three generations x accurate	5.71** (3.47)	2.21 (1.26)	4.47* (3.06)	1.90 (1.19)

35 - 44  
cohort

Residential school density x  
Aboriginal language

Predictors

One generation x non-speaker	0.45* (0.15)	0.87 (0.30)	0.71 (0.22)	0.82 (0.25)
Two generations x non-speaker	0.67 (0.32)	0.72 (0.26)	0.88 (0.29)	0.83 (0.29)
Three generations x non-speaker	1.64 (0.93)	1.10 (0.68)	0.59 (0.32)	0.68 (0.44)
Zero generations x speaker	1.37 (0.44)	1.43 (0.42)	0.86 (0.28)	0.88 (0.23)
One generation x	1.22	0.93	1.30	1.21

	< High school		Post-secondary	
	UI	I	UI	I
speaker	(0.50)	(0.43)	(0.54)	(0.44)
Two generations x speaker	0.56 (0.33)	0.82 (0.36)	1.22 (0.57)	1.30 (0.51)
Three generations x speaker	0.12** (0.08)	0.34 (0.22)	0.89 (0.68)	1.06 (0.70)

Residential school density x  
accuracy of teaching about  
Aboriginal peoples in school

Predictors

One generation x not taught	0.52* (0.14)	0.90 (0.23)	0.85 (0.24)	0.90 (0.24)
Two generations x not taught	0.46* (0.18)	0.67 (0.20)	0.68 (0.20)	0.75 (0.22)
Three generations x not taught	0.62 (0.27)	0.81 (0.30)	0.96 (0.34)	0.94 (0.32)
Zero generations x not accurate	0.33† (0.19)	0.30† (0.19)	2.11 (0.98)	1.13 (0.50)
Zero generations x accurate	0.66 (0.27)	0.88 (0.28)	0.87 (0.30)	1.02 (0.75)
One generation x not accurate	0.80 (0.55)	1.01 (1.04)	0.62 (0.38)	1.06 (0.75)
Two generations x not accurate	1.12 (0.80)	1.47 (0.89)	0.71 (0.42)	1.34 (0.78)
Three generations x not accurate	0.30 (0.41)	0.49 (0.50)	0.07* (0.09)	0.30 (0.28)
One generation x accurate	1.07 (0.56)	0.82 (0.45)	0.94 (0.46)	0.85 (0.32)
Two generations x accurate	1.23 (0.70)	0.88 (0.48)	3.61* (1.82)	1.77 (0.76)
Three generations	0.58	0.42	0.82	0.77

	< High school		Post-secondary	
	UI	I	UI	I
x accurate	(0.40)	(0.25)	(0.48)	(0.62)

45 – 54  
cohort

Residential school density x  
Aboriginal language

Predictors

One generation x non-speaker	0.51 (0.24)	0.64 (0.33)	0.59 (0.25)	0.80 (0.47)
Two generations x non-speaker	0.89 (0.48)	0.77 (0.37)	0.68 (0.32)	0.89 (0.98)
Three generations x non-speaker	0.39 <sup>†</sup> (0.19)	0.41 (0.28)	0.88 (0.52)	0.68 (0.40)
Zero generations x speaker	1.31 (0.46)	1.55 (0.49)	1.38 (0.55)	1.28 (0.44)
One generation x speaker	1.28 (0.76)	1.13 (0.95)	0.84 (0.48)	0.72 (0.45)
Two generations x speaker	0.52 (0.34)	0.87 (0.62)	0.62 (0.42)	0.66 (0.74)
Three generations x speaker	1.37 (0.76)	1.33 (1.13)	0.48 (0.32)	0.88 (0.56)

Residential school density x  
accuracy of teaching about  
Aboriginal peoples in school

Predictors

One generation x not taught	0.75 (0.25)	0.89 (0.29)	0.68 (0.23)	0.86 (0.46)
Two generations x not taught	0.87 (0.30)	0.97 (0.44)	0.76 (0.24)	0.84 (0.30)
Three generations x not taught	0.52* (0.17)	0.51 <sup>†</sup> (0.18)	0.58 (0.23)	0.64 (0.26)
Zero generations	0.92	0.69	2.02	1.50

	< High school		Post-secondary	
	UI	I	UI	I
x not accurate	(0.63)	(0.46)	(1.00)	(0.80)
Zero generations x accurate	0.88 (0.46)	0.82 (0.35)	1.38 (0.63)	1.25 (0.49)
One generation x not accurate	0.22 (0.21)	0.21 (0.24)	0.83 (0.66)	0.68 (0.73)
Two generations x not accurate	0.47 (0.41)	0.46 (0.43)	0.90 (0.62)	0.82 (0.80)
Three generations x not accurate	0.54 (0.47)	0.77 (0.73)	0.94 (0.69)	1.13 (0.97)
One generation x accurate	0.69 (0.55)	0.60 (0.38)	0.50 (0.40)	0.54 (0.50)
Two generations x accurate	0.19 <sup>†</sup> (0.19)	0.25 (0.22)	0.27 (0.26)	0.63 (0.90)
Three generations x accurate	1.99 (1.76)	1.24 (0.97)	1.32 (1.01)	1.39 (1.19)

*Note.* Odds ratios with standard errors in parentheses. Reference category is high school graduate. Models include controls for sex, Registered Indian Status, community type, community region, self-rated health, ability to speak an Aboriginal language, and accuracy of teaching about Aboriginal peoples in school. UI = unimputed. I = imputed.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

significant in the unimputed  $F(14, 486) = 1.98, p = .02$  and imputed  $F(7, 245.5) = 2.54, p = .02$  models.

Among those who were not taught about Aboriginal peoples in school, those who had two or three generations who attended residential school were less likely to have less than high school compared to those with no family history. Between those with no family history, respondents who were taught, whether judged to be accurate or inaccurate, had lower odds of having less than high school than those who were not taught. The odds ratio for those with two or three generations of attendance compared to those with zero generations were larger for those who deemed what they learned to be accurate than those who were not taught in the unimputed model.

Among those who were not taught about Aboriginal peoples, the odds of having post-secondary relative to high school were lower for those with a two generation history compared to those with no history in the unimputed model. The conditional effect of having three generations who attended compared to having no family history was significantly larger among those who rated what they learned about Aboriginal people to be accurate compared to not being taught in the unimputed model. The Adjusted Wald test was significant in the unimputed  $F(22, 478) = 2.41, p < .001$  and imputed  $F(11, 216.4) = 2.82, p = .002$  models.

*35 to 44 cohort.* In the 35 to 44 cohort, among Aboriginal language non-speakers, those with one generation who attended residential school were less likely than those with no family history to have less than high school in the unimputed model. The conditional effect of having three generations who attended compared to those with no

history was smaller for speakers than non-speakers in comparisons of the odds of having less than high school compared to high school.

There were no significant differences in the odds of post-secondary compared to high school by residential school density and Aboriginal language proficiency. The Adjusted Wald test was significant in the unimputed  $F(14, 486) = 3.14, p < .001$ , but not imputed  $F(7, 125.0) = 1.33, p = .24$  model.

Among respondents who were not taught about Aboriginal peoples in school, those with one and two generation histories were less likely to have dropped out of high school compared to those with no family history in the unimputed models. Those who were in the zero generations category and deemed what they learned about Aboriginal peoples to be inaccurate had lower odds of having less than high school compared to those who were not taught anything.

In the post-secondary relative to high school models, the ratio between three generations and zero generations was smaller for the not accurate category compared to those who were not taught in the unimputed model. The ratio was larger between those with two generations compared to those with zero generations in the accurate relative to not taught categories. The Adjusted Wald test was significant in the unimputed  $F(22, 478) = 4.84, p < .001$  and imputed  $F(11, 185.4) = 2.22, p = .02$  models.

*45 to 54 cohort.* In the 45 to 54 age cohort, among non-speakers, those with three generations who attended residential school were less likely than those with no history to have less than high school in the unimputed model. There were no other significant differences by Aboriginal language proficiency. The Adjusted Wald test was not



significant in the unimputed  $F(14, 486) = 1.01, p = .44$  or imputed  $F(7, 147.0) = 1.18, p = .32$  models.

In the accuracy models, among those who were not taught about Aboriginal peoples, those in the three generations category had lower odds of being high school non-graduates compared to those with no history. The odds ratio between those with two generations who attended and those with no history was smaller for those in accurate category compared to the not taught category in the unimputed model.

There were no significant differences by density and accuracy in the post-secondary relative to high school models. The Adjusted Wald test was significant in the unimputed  $F(22, 478) = 1.98, p = .005$  and imputed  $F(11, 522.6) = 2.05, p < .02$  models.

#### Discussion and Conclusion

Overall, there was no clear pattern of educational disadvantage among residential school Survivors and their children and grandchildren. The general pattern found was that those who attended residential school had higher odds of having less than high school and lower odds of having post-secondary compared to those with no history. However, in many cases the difference in odds did not reach statistical significance. The addition of controls often reversed the direction of the coefficient, particularly in the less than high school category, which suggests that differences in odds between Survivors and non-Survivors is in part a function of differences in their social, geographic, and cultural profiles. Respondents who had a parent or grandparent who attended had odds of having less than high school that were similar to or lower than those with no history. On the other hand, they also had odds of post-secondary attainment that were either not significantly higher or significantly lower than those with no history. The general lack of

significant differences in odds between the grandparent and no history categories in both the base and full models tentatively suggest diminishing effects across generations. However, due to limitations in the analyses, further research is needed to corroborate this finding. In terms of density, those with generational histories of residential school attendance had both lower odds of having less than high school and post-secondary compared to those without a family history. However, in many cases the difference in odds was not statistically significant. There was no evidence of compounding effects in families with multigenerational histories.

In terms of the control variables, the overall picture is consistent with other research. Males, Registered Indians, those living on reserve or in rural or Arctic locations, and in poor health tend to have lower educational attainment. Speaking an Aboriginal language was generally associated with lower odds of higher educational attainment, although often the difference was not significant. It is quite possible that the measure of Aboriginal language fluency is confounded with other factors that explain the negative relationship with educational attainment. For example, the most viable Aboriginal languages are found among First Nations with a large, relatively young, population base, such as the Cree, and in relatively isolated or remote communities. Registered Indians living on reserve are also more likely to speak their traditional language (Norris, 1998; RHS National Team, 2007). All of these factors are also associated with lower educational attainment.

Those who learned about Aboriginal people in school, whether deemed accurate or inaccurate, tended to have lower odds of having less than high school and higher odds of post-secondary. The interesting finding is that perceiving what was learned to be

inaccurate is not detrimental to educational attainment compared to learning nothing. It may well be that those who are the most knowledgeable about the pre- and post-contact histories of Aboriginal peoples in Canada tend to be the most critical, particularly when the source is not an Aboriginal person or institution.

When interaction terms were included to capture the conditional effect of speaking an Aboriginal language or ratings of the accuracy of teaching on different categories of residential school exposure, the picture becomes more complex than the main effects suggest. First, considering the moderating effect of speaking an Aboriginal language, there were few significant differences in the odds of educational attainment by residential school proximity or density among non-speakers. However, among those without a family history of residential school attendance, those who spoke an Aboriginal language were much more likely to have less than high school compared to their non-fluent counterparts. The interaction terms suggest that the difference in odds of educational attainment between speakers and non-speakers within each residential school category is smaller compared to those without a family history. These results suggest that intergenerational residential school Survivors who speak an Aboriginal language do not have substantially better odds of higher educational attainment compared to their non-fluent counterparts.

Second, the results for the accuracy of teaching about Aboriginal people in school as a moderator suggest that among those who were not taught anything, those with a personal or family history of residential school attendance had lower odds of having less than high school compared to those with no family history. They also had lower odds of having post-secondary, but only a few of the odds ratios were significant. Those without

a family history who were taught about Aboriginal peoples in school, whether rated as accurate or inaccurate, had lower odds of having less than high school compared to those who were not taught anything. Within each residential school history category, the effect between those who were taught compared to those who were not taught was generally larger compared to those with no family history in the youngest cohort. The ratio was often smaller between intergenerational Survivors in the older cohorts. While there is no evidence of strong moderating effects, the main effects model suggests that learning about Aboriginal peoples in school decreases the odds of dropping-out and increases the odds of post-secondary. Finding out what shapes people's perceptions of what they learn may enhance these positive effects. Developing curricula that incorporate the perspectives of Aboriginal peoples would likely improve ratings.

#### Limitations

The results of these analyses should be treated as tentative. The major barrier to drawing stronger conclusions is data quality. Many of the effects were significant for the unimputed model, but not the imputed one, which suggests that which effects are significant may be a function of the pattern of missing data or algorithm used in imputing data rather than "real" relationships between residential school exposure and educational attainment. In other words, there may be biases based on who opted not to provide answers to specific questions. There may also be biases related to how the regression models filled in those missing values.

It is likely that those who share the same residential school proximity or density had different experiences at residential school or within their family as a result of residential school experiences. There are no data about residential school experience,

such as cohort, timing, duration, ratings or inventories of stressors or trauma. As a result, everyone with a similar history is empirically treated as having comparable experiences. A related issue is that we cannot directly measure the consequences of residential school experience that may have had a direct impact on the likelihood of higher educational attainment and set the context for future generations. There is also no familial data available in order to link generational contexts. It may be that the critical variable is not attendance or non-attendance but the degree to which trauma was experienced, healed, or transmitted. For example, research has suggested that the degree of community control or autonomy, social integration, and success in settling land claims and establishing self-government impacted the extent to which residential school trauma transformed into social problems, such as poor physical and mental health, substance abuse, violence, and lower educational attainment (C. L. Tait, 2003). Without information about residential school experiences and consequences, all people who share the same kind of exposure are categorized together, which may mask potential within group differences.

Single point-in-time data are also limiting when the models are attempting to capture processes over time. Educational attainment can be thought of as a series of critical periods that affect whether or not a person attends school, completes the requirements for specific credentials, and continues on to higher levels of attainment. Certainly the personal, familial, community, and wider social contexts at those points in time matter. These data require us to assume a high degree of continuity in these conditions. The conditions under which a respondent is currently living may be very different from those under which educational credentials were attained. Despite these

limitations, the topic is an important one about which little empirical research has been published.

A clear pattern of improving or worsening educational attainment across generations of residential school Survivors does not emerge from these analyses. Rather, the picture seems to be one of specific effects; some of which are in the opposite direction predicted. Whether this pattern is a function of missing data or the complexity of the relationships between residential school exposure and education has yet to be determined. In some cases, differences by residential school exposure are explained by other variables, such as where people live. In other cases, controlling for these other factors enhances the effect of residential school exposure on educational attainment. It may be that other variables not included in these models either explain or enhance differences between groups of Survivors. For example, communities where a large proportion of residents attended residential school may have higher rates of social problems, such as substance abuse, violence, and mental health issues, which create barriers to the completion of educational credentials.

The control variables included in these models, sex, Registered Indian Status, community type, community region, self-rated health, ability to speak an Aboriginal language, and accuracy of teaching about Aboriginal peoples in school, tended to be better predictors of the odds of having less than high school relative to high school than having post-secondary relative to high school. There may be other factors, such as economic opportunities in one's home community, which influence choices about higher education (White & Beavon, 2009).

Conducting cohort analyses appears to be fruitful. There are differences by cohort in both residential school exposure and educational attainment according to descriptive data. In addition, the models presented here suggest that not all variables are statistically significant predictors educational attainment in each cohort. Cohort analyses enable researchers to reduce heterogeneity related to age and time period.

It appears there are mediating factors that help explain the relationship between residential school and educational attainment. Research involving younger cohorts suggested potential mediators between residential school exposure and educational success. Bougie and Senécal (2009) examined factors affecting the odds of doing well or very well in school, according to parent or guardian reports, among Treaty or Registered Indian children aged 6 to 14 living off reserve. They found that children whose parent(s) had attended residential school were less likely to being doing well at school. Mediation analyses showed that the pathways between parental residential school experiences and lower academic performance were partially mediated by lower household income, living in larger households, and experiencing periods of food insecurity. There were no differences in ratings of the importance of their children graduating from high school between parents who attended residential school and those who did not. In other words, there was no change in attitude toward education itself because of residential school experience. Interestingly, speaking an Aboriginal language at home was associated with better school performance among these children. There may be a generational effect with speaking an Aboriginal language being associated with lower educational attainment among adults. Efforts to combat the rapid loss of language may be bringing the opportunity to learn and speak First Nations languages to children in communities closer

to or in urban centres where there are fewer barriers to higher education. Data from the RHS 2002 to 2003 cycle found that youth who had a parent who attended residential school were more likely to report learning problems at school or having to repeat a grade than their peers whose parents did not attend; however, there were no differences in terms of attendance or liking school. On the other hand, there were no differences in any of these outcomes between youth who had grandparents who attended and those who did not (RHS National Team, 2007). These findings suggest a weakening effect of residential school attendance and educational outcomes across generations.

#### Directions for Future Research

These results suggest that the relationships between residential school history, language, education about Aboriginal peoples, and educational attainment are complex. Better data are needed to begin unravelling these interrelationships. It would be beneficial to have data that would enable life course analysis in order to capture dynamics related to familial ties, early life contexts, risks and protective factors that shape educational trajectories. Life course perspectives would assist researchers in conceptualizing the intergenerational transmission of trauma. In particular, it could provide a framework for investigations into how residential school trauma creates conditions that give rise to early adversities among Survivors, their children and grandchildren that impact educational trajectories. Factors such as the timing and duration of residential school exposure may also be important. This perspective could also be used to examine protective factors that may mitigate or ameliorate the negative effects of historic traumas. Life course research requires longitudinal data covering at least a decade (George, 1999) and two generations of survivors. Given the commitment required from Survivors and their families, as well



as the sensitivity of the issue, a small-scale participatory research approach to collect qualitative interview data may yield a better response and higher quality data than large - scale quantitative surveys.

We need comprehensive data on the range of risk factors that may perpetuate historic traumas, as well as protective factors that may be mobilized. In addition, it is important to understand the traditional sources of strengths within First Nations since these may be more effective in counteracting residential school and intergenerational traumas (Hanson & Hampton, 2000). While many negative coping strategies have been reported among residential school survivors, many also cite environmental protective factors that have contributed to well-being. These include time spent with family before attending residential school that provided opportunities for teaching and nurturing, social support among survivors, engagement in extra-curricular activities, and spiritual or religious beliefs (Stout & Kipling, 2003). A qualitative study of six elders from Saskatchewan who were survivors reported that they drew upon community-building skills from their First Nations cultures during their time in residential school (Hanson & Hampton, 2000). Currently, data on these factors are not widely available.

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Running head: CHURN MIGRATION AND EDUCATIONAL ATTAINMENT

## CHAPTER 5

Churn Migration and Educational Attainment among Aboriginal Adolescents and Young  
Adults

Susan Wingert



## Churn Migration and Educational Attainment among Aboriginal Adolescents and Young Adults

It has been widely recognized that the Aboriginal population is, on average, more mobile than the non-Aboriginal population (Norris, Cooke, & Clatworthy, 2003; Statistics Canada, 2008). While research has documented many of the antecedents to and reasons for frequent moves in this population, little work has examined the social consequences. Drawing on theories about social capital and social cohesion, it is theorized that frequent moves between communities break the bonds that enable people to access social capital, which, in turn, undermine community social cohesion. One consequence of this process is hypothesized to be lower levels of educational attainment.

While the process of “churn” migration is believed to affect a wide range of outcomes, educational attainment was selected because it is a foundational component of socioeconomic status. There is also widespread support within the Aboriginal community for improving educational outcomes as a way of improving individual and community conditions (Royal Commission on Aboriginal Peoples, 1996).

### Literature Review

#### *Educational Attainment*

In general, national data on educational attainment among Aboriginal peoples in Canada suggest that there have been improvements over time, but relative gaps remain. Aboriginal people tend to be overrepresented in the less than high school category and underrepresented in the high school diploma, college or university certificate or diploma, and university degree categories (Mendelson, 2004). According to 1996 data, Aboriginal young adults were 2.6 times less likely to have completed high school compared to non-

Aboriginals, and were 50% less likely to have completed post-secondary (Tait, 1999). Among Aboriginal youth aged 20 to 24 living in a census metropolitan area (CMA), the proportion without a high school diploma declined between 1981 and 2001, however, graduation rates improved more sharply among non-Aboriginal young adults, which widened the gap (McMullen, 2005).

Patterns of attainment in the Aboriginal population differ somewhat from the Canadian population. Data suggest that within the Aboriginal population, uninterrupted educational attendance until the highest desired credentials are completed is less common. Secondary and post-secondary completion rates tend to be highest among those over the age of 25, which suggests that many return to complete education as adults (Hull, 2005, 2009). This trend is particularly evident among First Nations women (Milligan & Bougie, 2009). Aboriginal women have slightly higher levels of educational attainment with the largest gaps at the university degree level (Hull, 2005; Milligan & Bougie, 2009). One additional trend that is noteworthy is that lone parenthood appears to be a barrier to higher educational attainment among young adults; however, it is less so among older age groups, particularly among Aboriginal women (Hull, 2005). Aboriginal lone mothers were more likely than non-Aboriginal lone mothers (Hull, 2001) or those from two-parent families (Tait, 1999) to attend school.

It appears that there are barriers to education that are unique to or more prevalent among Aboriginal peoples. The 2001 Census shows that young adults from every ethnic minority group had higher rates of high school completion compared to Aboriginals (Beavon & Guimond, 2006). Potential explanations include negative attitudes toward education as a result of the residential school legacy, fewer perceived returns on

education, a lack of economy within or near reserve, rural, remote, or Arctic communities, disconnect between traditional culture and pedagogical approach, geographical isolation from higher education institutions, and discrimination or alienation within the school system (Maxim & White, 2006; R.A. Malatest & Associates Ltd., 2004; Richardson & Blanchet-Cohen, 2000; Spence, White, & Maxim, 2007; White, Spence, & Maxim, 2006). Rates of school non-completion are highest among Inuit, followed by Registered Indians, non-Status Indians, and Métis (Beavon & Guimond, 2006). Tait (1999) noted that Métis are less likely to live in remote communities and the North, and have had formal education and greater connection to mainstream institutions historically. Opportunities for higher education and employment are often limited in Inuit and First Nations communities, which means that people have to leave their communities, social supports, and way of life behind in order to attend post-secondary institutions.

Research has shown that there are significant benefits to higher education for Aboriginal peoples. Hull (2005) found that, among all Aboriginal groups, labour force participation increases and government transfer dependence decreases with education. Gaps in labour force participation among Aboriginal persons compared to non-Aboriginals were very small at the same educational level. There also appear to be threshold effects with the likelihood of unemployment decreasing significantly at the secondary graduate, post-secondary certificate and university degree levels (Hull, 2005; Tait, 1999). Walters, White, and Maxim (2004) found that, controlling for sociodemographic characteristics, level of schooling, and field of study, Aboriginal post-secondary graduates earn more than non-minorities and visible minorities. The advantage was particularly pronounced at the university degree level.

### *Mobility Patterns*

While there is a persistent myth that a mass exodus from reserves to urban centres, the migration pattern of Aboriginal peoples is more aptly characterized as “churn” into and out of cities and within cities (Norris & Clatworthy, 2003). Registered Indians with ties to reserve tend to move back and forth between their First Nations communities and urban centres (Norris & Clatworthy, 2003). Between 1991 and 1996, the largest percentage of individuals who left reserves moved to urban centres (61%) while the majority moving to reserves came from cities (69%) (Norris, Beavon, Guimond, & Cooke, 2004). The off reserve population is even more highly mobile. Among those in large cities, at least half of all moves were within the same community (Norris & Clatworthy, 2003). Mobility patterns have been linked to age with young adults having the highest rates (Norris & Clatworthy, 2003). Major reasons for migration include family, housing, education, employment, and community factors (Beavon & Norris, 1999; Distasio, Sylvester, Jaccubucci, Mulligan, & Sargent, 2004; Norris & Clatworthy, 2003). While we often think of the on and off reserve populations as being completely distinct, they are often connected through mobility as well as culture and politics (Graham & Peters, 2002).

### *Social Capital and Social Cohesion*

Social capital “can be defined as the networks of social relations within the milieu, characterized by specific norms and attitudes that *potentially* enable individuals or groups to access a pool of resources and supports” (White & Maxim, 2003, p. 67). Coleman (1988) argued that social capital is “a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they

facilitate certain actions of actors – whether persons or corporate actors – within the structure” (p. S98). Social capital is produced through changes in *relations* among individuals that facilitate certain actions (Coleman, 1988). Individuals can use the resources and supports available through social networks to achieve their own goals. In addition, there are also effects that improve conditions in the community and may enhance the well-being of residents who are comparatively isolated. Communities with high levels of social capital have dense webs of personal connections, established rules of conduct, and generalized reciprocity all of which build trust (Putnam, 2000). The literature has generally suggested that social capital is a source of: 1) social control; 2) family support; and 3) access to resources in networks outside the family (Portes, 1998). While most theoretical and empirical work on social capital has emphasized positive dimensions, it also has negative ones including “exclusion of outsiders, excess claims on group members, restrictions on individual freedoms, and downward levelling norms” (Portes, 1998, p. 15).

Social cohesion can be considered a framing concept since there is no consensus about its precise definition (Beauvais & Jenson, 2002). It can be thought of as “the capacity of community members to live in harmony” (Policy Research Initiative Project, 2005, p. 8). The literature discusses four different aspects of social cohesion: 1) common values and civic culture; 2) social order and social control; 3) social solidarity and low levels of inequality; 4) social networks and social capital; and 5) belonging and identity (Beauvais & Jenson, 2002). Community ties have been identified as a key determinant of social cohesion particularly when defined as social networks, capital, or solidarity (Beauvais & Jenson, 2002).

Social capital and social cohesion are interrelated concepts. For example, Beauvais and Jenson (2002) argued, “higher levels of social cohesion raise the return to social-capital investment” (p. 26). However, the distinction between the two concepts is that “*social capital* comprises individual actions like joining an organization or doing volunteer work. *Social cohesion* is a characteristic of a group of people, determined by their propensity to invest in social capital” (Beauvais & Jenson, 2002, p. 26).

### Conceptual Model

The conceptual model used here draws upon theoretical work by White and Maxim (2003) and Beavon and Norris (1999). White and Maxim’s (2003) model proposed that there are reciprocal relationships among human, physical, and social capital in communities. In turn, social capital affects social cohesion, which affects population outcomes. “If levels of migration are high, either measured as net migration or in terms of the rate of “churn,” the probability of forming associations, clubs, parent-teacher groups, sports clubs, and so on is diminished. Any community civic life would be negatively affected” (White & Maxim, 2003, p. 7). Beavon and Norris (1999) theorized that high levels of mobility, which are influenced by demographic, political, and legal factors along with push and pull dynamics between community of origin and destination, undermined community social cohesion, which contributed to a higher incidence of social problems that further fuelled churn migration. The authors theorized that churn migration patterns were related to a range of economic and social outcomes. The model used here borrows from this latter part of the model by proposing links between social capital, social cohesion, and educational attainment (Figure 1). The social structure provides the context in which these patterns occur, which is why we include controls for gender,

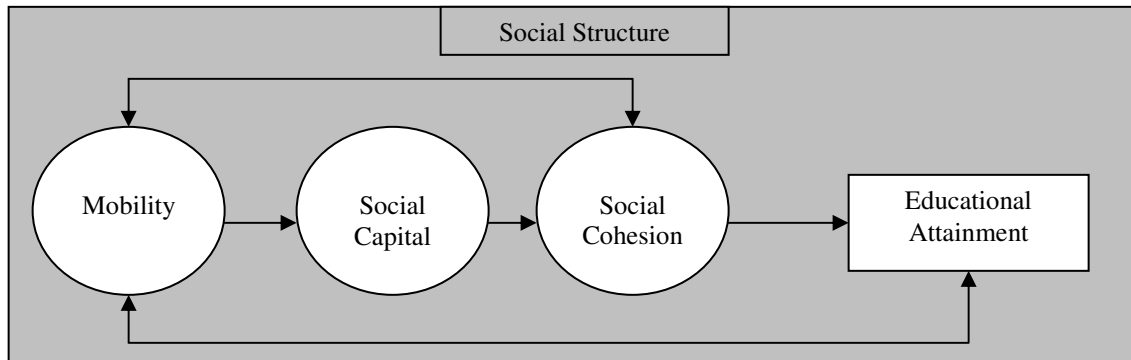


Figure 1. Conceptual model linking mobility and educational attainment.

community ties, family structure, labour force participation, and economic family income. While any degree of mobility has the potential to break bonds of social capital, moves that occur between communities are most likely to disrupt social networks both spatially and temporally (Beavon & Norris, 1999).

There is some research on non-Aboriginal populations that support parts of this model. For example, Pribesh and Downey (1999) used two waves of data on high school students from the national Education Longitudinal Survey to examine the relationship between residential and school moves and academic performance. They found that school-only, residential-only, and combined school and residential moves were associated with declines in social capital and academic performance. Importantly, most of the difference in effect between movers and non-movers was due to difference in the groups predating the move. The authors concluded that the family types that tend to move more often also experience other forms of social and economic disadvantage.

Aman (2006) examined educational outcomes among different cohorts of Aboriginal students in British Columbia. Student mobility was associated with lower levels of school completion. Part of the explanation appears to be that where there is more than one school in the centre, mobile Aboriginal students tend to cluster in schools in communities with poorer economic and social conditions. However, it was also found that “higher proportions of Aboriginal students (*notwithstanding* these higher proportions may be more likely to occur in schools in where poor socioeconomic conditions prevail) are linked to increases in Aboriginal graduation *and* Band graduation at the school level” (p. 93). This finding suggests that bonding on the basis of identity may buffer against the effects of negative socioeconomic conditions.



## Method

### *Data*

The Aboriginal Peoples Survey (APS) is a post-censal survey that targets individuals who reported Aboriginal ancestry, identity, or Indian Band, Indian Treaty, or Registered Indian status in the Census (Statistics Canada, 2006). The data for these analyses come from the 2001 APS Public Use Microdata File (PUMF) of adults (aged 15 and over) off reserve (i.e., excluding individuals living in First Nations communities or reserves). The sample covers private occupied dwellings in the ten provinces and three territories. Data were collected between September 2001 and June 2002. Among those who reported Aboriginal identity, data were collected using both in-person and telephone methods. The overall response rate for the survey, including the on reserve component, was 84.1%. Statistics Canada generated sampling weights that adjust for errors and population characteristics (Statistics Canada, 2006). These weights were applied in all analyses with the exception of missing case and regression diagnostics where such weights are not permitted.

### *Sample*

Respondents in the 15 to 19 ( $N = 4,280$ ) and 20 to 24 ( $N = 3,350$ ) age groups were selected. It was theorized that these two age groups represented key periods during which frequent moves would have the greatest impact on the likelihood of dropping out, completing high school, and pursuing post-secondary education. The groups were analyzed separately since the 20 to 24 year-olds were old enough to have completed high school, while most members of the younger group were not.

### *Measures*

The dependent variable was generated from the highest level of schooling and whether currently attending an educational program. Respondents were classified according to whether they had graduated from high school (with diploma or General Educational Development (GED) diploma) and whether they were currently attending a secondary or post-secondary program. Four categories were created: 1) drop-outs (had not completed high school and were not currently attending); 2) non-graduates (had not completed high school, but were currently attending); 3) graduates (had graduated high school, but had not pursued post-secondary); and 4) post-secondary (had graduated high school and pursued post-secondary). Those who indicated on their highest level of educational attainment that they had completed some post-secondary, a certificate or diploma program, or a university degree were coded in the post-secondary group even if they were not currently enrolled.

Independent variables included frequency of moves, which was derived into five ordered categories based on two variables in the APS that identified whether respondents had ever moved and how many times they had moved in the past five years excluding moves within the same city, town, or community. It is important to note that this variable misses movement within municipalities and neighbourhoods. However, the variable still captures those moves that are most likely to disrupt social capital networks. Given that respondents in the APS PUMF were living off reserve at the time of the survey, one would expect the data to underestimate the within community mobility characteristic of the off reserve population, but to capture the churn migration typical of the on reserve

population. The reference category included those who had never moved compared to those who had moved zero, one, two, or three or more times in the past five years.

Sex was dummy coded with females as the reference category.

The family structure variable in the model is based on Statistics Canada's census family status, which includes married or common-law couples with or without children and lone-parents whose children live in the same dwelling. Grandparents living with grandchildren are considered census families if the children's parent(s) do not live in the household. Children who are married, common-law, or have children are not considered to be part of their parents' census family even if they share the same dwelling. Non-census families include people living alone, with other relatives, or non-relatives. Four categories were created: 1) child living with parents or grandparents; 2) common-law or married couples; 3) lone parents; and 4) non-census family. Ideally, I would have liked to use variables that provide a broader view of household structure. For example, the challenges facing lone parents living on their own are likely greater than their counterparts who continue living with family, enabling them to pool resources such as money and social support. Unfortunately, the variables necessary to discern living arrangement were not available in the dataset. Child was set as the reference category.

A variable was created to capture community ties. Those who reported North American Indian as part of their identity and were members of an Indian Band or First Nation were coded as having stronger ties to reserve. Those who reported being Inuit, or non-Inuit living in the Arctic, were coded as having ties to the Arctic. All others were coded as having stronger ties to off reserve communities since they are not eligible for

housing on reserve and do not live in the Arctic. Dummy variables were created with off reserve ties as the reference category.

Labour force participation was coded according to whether a respondent was employed, unemployed, or not in the labour force (not working for pay or looking for employment). Not in the labour force was set as the reference category.

The income measure used was economic family income, which sums all of the income for family members (related by blood, marriage, common-law, or adoption) in the same household. We felt that this variable more accurately captures the actual level of differential resources available to the family compared to individual income. In order to reduce the number of dummy variables, the seven categories, ranging from less than \$10,000 per year to \$80,000 plus, were recoded into four: less than \$10,000, \$10,000 – \$29,000, \$30,000 – \$59,000, and \$60,000 plus. The reference category was the highest income group.

The proposed model conceptualizes that social capital gives rise to social cohesion. There are no variables that adequately capture social capital in the APS PUMF. Social support was used as a proxy measure of social capital since support is one resource that may be accessed from networks (Policy Research Initiative Project, 2005). The limitation of this approach to measuring social capital is that it primarily taps into bonding social capital as opposed to linking or bridging. It also misses potential negative consequences of social capital, such as involvement in gangs or other groups that engage in illegal or socially deviant behaviours. Respondents were asked to rate how frequently various forms of social support were available to them on a four-point Likert scale ranging from all of the time to almost none of the time. Variables were reverse coded so

high scores reflect high levels of social support. The variables were coded into four dimensions of social support: 1) social interaction, which combined variables measuring how often respondents have someone to do something enjoyable, relax, or to have a good time); 2) emotional support, which combined variables related to having someone to listen, confide in, or count on for advice; 3) affectionate support, which was based on a variable measuring the availability of love and affection; and 4) tangible support, which measured how often someone was available to take the respondent to the doctor when needed. The subscales were given equal weighting and combined. The scale was adjusted so it ranged from 1 to 37. Cronbach's Alpha was 0.80 for the 15 to 19 cohort and 0.78 for the 20 to 24 cohort.

There were also limited measures of social cohesion in the APS PUMF. The measure of cohesion was based on a series of questions that asked respondents to respond yes or no whether suicide, family violence, sexual abuse, drug abuse, or alcohol abuse were a problem in their community. Responses were coded so that "no" was given a value of 0 and "yes" was given a 1. Responses were summed plus one and the scale reversed so high scores reflect higher cohesion. Scores ranged from 1 to 6. Cronbach's Alpha was 0.89 for the 15 to 19 group and 0.90 for the 20 to 24 group.

### *Analysis*

Data were analyzed using hierarchical multinomial logistic regression models in STATA 10 (StataCorp, 2007). Ordinal regression was not used because the data violated the parallel lines assumption according to the Brant test  $\chi^2(34) = 364.89, p < .001$  in the 15 to 19 group and  $\chi^2(34) = 141.72, p < .001$  in the 20 to 24 group. All data are weighted using the sample weights provided by Statistics Canada.

There was no evidence of multicollinearity among independent variables. In addition, the Box-Tidwell test for nonlinearity in the logit was also not significant for social support  $Wald \chi^2(3) = 5.83, p = .12$  or cohesion  $Wald \chi^2(3) = 2.70, p < .44$  in the younger cohort model, as well as in the older cohort model  $Wald \chi^2(3) = 5.37, p = .15$  and  $Wald \chi^2(3) = 2.08, p < .56$  respectively. Currently, diagnostic tests for multinomial logistic regression are limited in Stata and most other statistical software packages. Following Menard (2010), regression diagnostics were performed for each separate equation in the model using logistic regression. Analysis of residuals for outliers and influential cases showed among 15 to 19 year-olds there were 32 cases with a standardized residual higher than  $\pm 2.58 (p = .01)$  in the model for non-graduates, 7 in the model for graduates, and 6 in the model for post-secondary with drop-out as the reference in all models. In the non-graduate model, most of the outlying cases were predicted to have a high probability of being non-graduates, but they were in the drop-out category. In the graduate and post-secondary models respectively, the outlying cases had low predicted probabilities of being graduates or post-secondary attendees, but nevertheless were. In the 20 to 24 age group, the model for non-graduates had 16 outliers, the model for graduates had 3, and the model for post-secondary had 8. In the non-graduate model and graduate models respectively, all of the cases had low predicted probabilities of being non-graduates or graduates, but respondents were. In the post-secondary model, respondents had strong predicted probabilities of being post-secondary attendees, but were not. While there were cases that also had a leverage statistic that were several times higher than the mean leverage value for the model, *dbeta* scores suggested

that the deletion of the case would produce little change in the logistic regression coefficients (Menard, 2010). All cases were retained for analyses.

In the 15 to 19 age group, there were 1,850 complete cases (56.8% missing); while in the 20 to 24 age group, there were 1,430 complete cases (57.3% missing) with data on all model variables. Missing cases analysis showed that having missing data among 15 to 19 year-olds was associated with educational attainment  $\chi^2 (3) = 9.58, p = .02$ , community ties  $\chi^2 (2) = 9.68, p = .008$ , and social support  $t (3,826.61) = 1.76, p = .04$ . Those with missing data were more likely to be in the drop-out category, live in the Arctic, and have lower average levels of social support. Among 20 to 24 year-olds, having missing data was associated with community ties  $\chi^2 (2) = 17.17, p < .001$ , labour force participation  $\chi^2 (2) = 7.28, p = .03$ , and social cohesion  $U = 2.00, p = .046$ . Those with missing data were more likely to live in the Arctic, be employed, and have lower cohesion ratings. In order to conduct analyses using all cases in the sample, multiple imputation was performed using the imputation by chained equations (ICE) package for Stata (Royston, 2010). Five imputed data sets were created and analyzed using the *mim* package for Stata 10 (Galati, Royston, & Carlin, 2010). Since complete cases analyses may be biased and imputed data represents a best guess as to what missing values might be, both sets of results are reported. Measures of model fit are not available when analyzing imputed data; however, these values are reported for the unimputed models.

## Results

### *Descriptives*

Table 1 presents both the unimputed and imputed descriptives for the each cohort in the sample. Among 15 to 19 year-olds about half are non-graduates, that is attending

Table 1

## Sample Descriptives by Cohort

	Ages 15-19		Ages 20-24	
	Unimputed	Imputed	Unimputed	Imputed
<b>Educational Level</b>				
Drop-out	710 (16.6)	720 (16.8)	590 (17.6)	600 (17.9)
Non-graduate	2,220 (51.9)	2,270 (53.0)	140 (4.2)	140 (4.2)
Graduate	630 (14.7)	640 (15.0)	660 (19.7)	680 (20.3)
Post-secondary	630 (14.7)	650 (15.2)	1,870 (55.8)	1,920 (57.3)
Missing	90 (2.1)	- -	100 (3.0)	- -
<b>Moves in past 5 years</b>				
Never	2,090 (48.8)	2,130 (49.8)	1,190 (35.5)	1,230 (36.7)
0	880 (20.6)	900 (21.0)	550 (16.4)	560 (16.7)
1	610	620	610	620



	Ages 15-19		Ages 20-24	
	Unimputed (14.3)	Imputed (14.5)	Unimputed (18.2)	Imputed (18.5)
2	250 (5.8)	260 (6.1)	340 (10.1)	350 (10.4)
3+	360 (8.4)	370 (8.6)	570 (17.0)	580 (17.3)
Missing	90 (2.1)	- -	100 (3.0)	- -
Sex				
Male	2,150 (50.2)	- -	1,540 (46.0)	-
Female	2,130 (49.8)	- -	1,810 (54.0)	-
Family structure				
Child	3,650 (85.3)	3,730 (87.1)	1,210 (36.1)	1,230 (36.7)
Married or common-law	160 (3.7)	160 (3.7)	1,060 (31.6)	1,070 (31.9)
Lone parent	80 (1.9)	90 (2.1)	360 (10.7)	360 (10.7)

	Ages 15-19		Ages 20-24	
	Unimputed	Imputed	Unimputed	Imputed
Non-family	300 (7.0)	300 (7.0)	670 (20.0)	680 (20.3)
Missing	90 (2.1)	- -	50 (1.5)	- -
Community ties				
Reserve	930 (21.7)	940 (22.0)	830 (24.8)	840 (25.1)
Off reserve	3,090 (72.2)	3,140 (73.4)	2,330 (69.6)	2,340 (69.9)
Arctic	200 (4.7)	200 (4.7)	160 (4.8)	170 (5.1)
Missing	60 (1.4)	- -	30 (0.9)	- -
Labour force participation				
Employed	2,040 (47.7)	2,070 (48.4)	2,040 (60.9)	2,060 (61.5)
Unemployed	560 (13.1)	570 (13.3)	370 (11.0)	370 (11.0)
Not in labour force	1,610 (37.6)	1,640 (38.3)	900 (26.9)	920 (27.5)

	Ages 15-19		Ages 20-24	
	Unimputed	Imputed	Unimputed	Imputed
Missing	70 (1.6)	- -	40 (1.2)	- -
Family income (1,000s)				
< \$10	340 (7.9)	350 (8.2)	470 (14.0)	470 (14.0)
\$10-29	820 (19.2)	840 (19.6)	980 (29.3)	980 (29.3)
\$30-59	1,300 (30.4)	1,320 (30.8)	990 (29.6)	1,000 (29.9)
\$60+	1,750 (40.9)	1,770 (41.4)	890 (26.6)	890 (26.6)
Missing	60 (1.4)	- -	30 (0.9)	- -
Social support (scores)				
Low (< 14)	70 (1.6)	80 (1.9)	90 (2.7)	100 (3.0)
Moderate (14 - 25)	490 (11.4)	540 (12.6)	440 (13.1)	490 (14.6)

	Ages 15-19		Ages 20-24	
	Unimputed	Imputed	Unimputed	Imputed
High (26 - 37)	3,440 (80.4)	3,660 (85.5)	2,610 (77.9)	2,770 (82.7)
Missing	280 (6.5)	- -	210 (6.3)	- -
Cohesion (Score)				
Low (1-2)	700 (16.4)	1,470 (34.3)	530 (15.8)	1,310 (39.1)
Moderate (3-4)	420 (9.8)	940 (22.0)	340 (10.1)	740 (22.1)
High (5-6)	1,030 (30.7)	1,870 (43.7)	630 (18.8)	1,300 (38.8)
Missing	2,130 (49.8)	- -	1,860 (55.5)	- -
<i>N</i>	4,280	4,280	3,350	3,350

*Note.* In accordance with Statistics Canada guidelines for post-censal surveys, frequencies have been rounded to the nearest unit of 10.

Percentages have been calculated based on rounded values. UI = unimputed data. I = imputed data.

secondary school. The remaining respondents were fairly evenly split across the drop-out, graduate, and post-secondary categories. In the 20 to 24 age group, more than half of respondents had at least some post-secondary. A very small proportion was still in secondary school. About 1/5 were secondary graduates with the remaining respondents having dropped-out.

Having never moved was the most common mobility category in both age cohorts; however, the proportion declines among 20 to 24 year-olds. A larger proportion of 15 to 19 year-olds have not moved in the past five years compared to their older counterparts. The data suggest that 20 to 24 year-olds are more mobile than those in the young age group with double the percentage of frequent movers in the older group. Nevertheless, approximately 14% of 15 to 19 year-olds have moved between communities two or more times in the past five years.

While the sex ratio is close to 50 / 50 among the younger cohort, females are overrepresented in the older cohort, perhaps reflecting the tendency of females to move more frequently, and from on to off reserve (Norris et al., 2004; Norris & Clatworthy, 2003). Research has found that Aboriginal women tend to move in a family context while men tend to move as lone persons for economic reasons (Peters, 1994). Women often leave their home communities in search of better housing, services, or employment; to escape abusive situations; or following the breakdown of a marital or common-law relationship (Cooke & Belanger, 2006; Norris et al., 2004; Peters, 1994). We would expect these conditions to be more common among young adults than adolescents. Bivariate analyses showed a significant association between number of moves and sex in the older cohort  $\chi^2(4) = 21.16, p < .001$ . Adjusted residuals suggested females were

under represented in the never moved category ( $z = -4.23, p < .001$ ) and overrepresented in the one ( $z = 2.62, p < .004$ ) and two ( $z = 2.19, p < .014$ ) moves in the past five years categories.

In the younger cohort, the vast majority were living with their parent or grandparents. Very small percentages were married, living common-law, or lone parents. The next most common living situation in this age group was to live in a non-family. In the older cohort, living with parents or grandparents was still the most common living arrangement, but the proportion dropped substantially with about 1/3 in this category. Another 1/3 were married or common-law and 1/5 were living in non-families. About 10% of respondents were lone parents.

The proportions in each category of community ties were similar across cohorts. The majority were living off reserve, which is not unexpected since the sample in the data set excludes on reserve residents. A slightly larger percentage had on reserve ties in the older cohort. We would expect that some young adults from First Nations communities choose to leave during this life stage in order to pursue education or work opportunities off reserve. Less than 5% were living in the Arctic. Interestingly, living in the Arctic is strongly associated with never having moved in both the younger ( $z = 9.14, p < .001$ ) and older ( $z = 10.25, p < .001$ ) cohorts.

In both the younger and older cohorts, being employed is the most common form of labour force participation, but the older cohort had substantially higher rates. Next most common was to be out of the labour force, that is neither employed nor looking for employment. Unemployment was slightly more common in the younger cohort than the

older one. The unemployment rate<sup>25</sup> was 21.5% for the younger group and 15.4% for the older group, which is substantially higher than the Canadian youth unemployment rate of 12.7% in April 2001 (Statistics Canada, 2001). There was a strong association between labour force status and community ties in the younger  $\chi^2(4) = 247.52, p < .001$  and older  $\chi^2(4) = 156.65, p < .001$  cohorts. Those with stronger ties off reserve were overrepresented among the employed ( $z = 14.58, p < .001$  in the younger and  $z = 11.85, p < .001$  in the older cohort), while respondents with strong ties to reserve had higher than expected numbers that were not in the labour force ( $z = 13.31, p < .001$  in the younger and  $z = 9.30, p < .001$  in the older cohort). Respondents aged 20 to 24 in the Arctic were overrepresented in the unemployed category ( $z = 3.90, p < .001$ ), while their younger counterparts were more likely to be out of the labour force ( $z = 3.21, p < .001$ ).

When we look at economic family income, those in the younger cohort were 1.5 times more likely to be in the highest income category compared to the older cohort, which likely reflects their greater propensity to live with parent or grandparents. Compared to the younger cohort, a significantly higher percentage in the older group had incomes below \$30,000. There was a significant association between family structure and income that supports this conclusion  $\chi^2(9) = 1,200, p < .001$  in the younger and  $\chi^2(9) = 1,100, p < .001$  in the older cohort. Respondents in the child category were overrepresented in the \$60,000 plus category ( $z = 14.26, p < .001$  younger and  $z = 25.34, p < .001$  older). Those who were lone parents ( $z = 5.73, p < .001$  younger and  $z = 9.12, p$

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<sup>25</sup> The unemployment rate excludes those who are not in the labour force. It is calculated as # unemployed / # in labour force.

< .001 older) or not in an economic family ( $z = 30.88, p < .001$  younger and  $z = 15.91, p < .001$  older) were overrepresented in the lowest income category.

The measure of social support was divided into three equal width categories. In both age groups, the vast majority reported high levels of support. While the numbers were small in both age groups, a slightly higher percentage in the older group reported low levels of support, which may reflect being further away from parents or grandparents or one's home community. It may also reflect higher demands, which require higher levels of support in order to cope effectively.

The social cohesion measure had the highest percentage of missing data, which may reflect the sensitivity of the questions. It may also be indicative of a lack of knowledge about conditions in the wider community. Based on imputed data, there was a fairly even split between the highest and lowest cohesion categories. Those in the younger age group were slightly more likely to report high levels of cohesion.

### *Multivariate Analyses*

Tables 2 and 3 report odds ratios for both base models with only the mobility variable and full models with control variables included for unimputed and imputed data respectively. Discrepancies between the unimputed and imputed data are noted.

*15 to 19 age cohort.* In the younger group, those who had not moved in the past five years had 1.5 times higher odds than those who had never moved to be a non-graduate in the base model without controls. There were no significant differences between those who had never moved and those who had moved once or twice in the odds of continuing with high school relative to dropping out. Having moved three or more times decreased the odds of being a non-graduate by 58% compared to those who had



Table 2

## Unimputed Hierarchical Multinomial Regression Tables Predicting Educational Attainment by Residential Mobility

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
15 - 19	Number of moves						
	Never	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
	Zero	1.59* (0.35)	2.19* (0.78)	1.33 (0.37)	1.63 (0.69)	1.58 (0.47)	3.34** (1.38)
	One	1.22 (0.28)	1.69 (0.69)	2.12** (0.59)	2.19 (1.07)	2.15** (0.61)	2.35† (1.11)
	Two	0.94 (0.30)	1.33 (0.60)	1.17 (0.55)	2.05 (1.30)	1.84 (0.72)	1.49 (0.90)
	Three +	0.42** (0.13)	0.34* (0.16)	0.58 (0.25)	0.17** (0.11)	0.61 (0.21)	0.53 (0.27)
	Sex						
	Male		0.77 (0.20)		0.83 (0.27)		0.86 (0.26)
	Female		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Family structure						
	Child		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Married / common-law		0.10** (0.07)		0.74 (0.54)		0.55 (0.35)
	Lone parent		0.12** (0.08)		0.45 (0.31)		0.27† (0.19)
	Non-family		0.73 (0.37)		2.20 (1.17)		1.87 (0.98)
	Community ties						
	On reserve		0.60† (0.17)		0.62 (0.29)		0.67 (0.32)
	Off reserve		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Arctic		0.43** (0.13)		0.29** (0.13)		0.34* (0.14)
	Labour force participation						
	Employed		0.23*** (0.07)		1.98 (0.83)		0.85 (0.31)
	Unemployed		0.30** (0.11)		1.35 (0.64)		0.44† (0.19)
	Not in labour force		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Family income (in thousands)						
	< \$10		0.39* (0.18)		0.21** (0.12)		0.38† (0.19)
	\$10 – 29		0.25*** (0.09)		0.13*** (0.06)		0.20*** (0.09)
	\$30 – 59		0.63 (0.22)		0.57 (0.23)		0.67 (0.27)
	\$60 +		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Social support		1.06** (0.02)		1.09** (0.03)		1.05* (0.02)
	Social cohesion		0.97 (0.06)		0.96 (0.08)		0.86* (0.06)
	<i>N</i>	4,040	1,850	4,040	1,850	4,040	1,850
	Model statistics – base						
	Likelihood-ratio chi-square	119.77***					
	<i>df</i>	12					
	McFadden’s R <sup>2</sup>	.012					
	McFadden’s adjusted R <sup>2</sup>	.008					
	Model statistics – full						

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Likelihood-ratio chi-square	622.86 <sup>***</sup>					
	<i>df</i>	51					
	McFadden's R <sup>2</sup>	.13					
	McFadden's adjusted R <sup>2</sup>	.10					
	Difference (full – base)						
	Likelihood-ratio chi-square	503.09 <sup>***</sup>					
	<i>df</i>	39					
	McFadden's R <sup>2</sup>	.12					
	McFadden's adjusted R <sup>2</sup>	.09					

20 – 24

Number of moves							
	Never	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
	Zero	2.03* (0.66)	3.13** (1.34)	1.16 (0.31)	1.36 (0.53)	1.32 (0.29)	1.46 (0.53)
	One	1.12 (0.39)	0.80 (0.45)	1.04 (0.26)	0.65 (0.25)	1.95** (0.42)	1.37 (0.48)
	Two	0.82 (0.50)	0.43 (0.38)	1.04 (0.42)	0.55 (0.25)	2.37** (0.60)	2.24* (0.78)

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Three +	2.91** (1.03)	2.85* (1.33)	1.77† (0.58)	2.34† (1.05)	1.91** (0.40)	2.43* (0.89)
	Sex						
	Male		0.46† (0.38)		0.60† (0.18)		0.43** (0.11)
	Female		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Family structure						
	Child		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Married / common-law		0.67 (0.34)		1.23 (0.44)		0.67 (0.22)
	Lone parent		3.03* (1.57)		0.98 (0.41)		0.45* (0.17)
	Non-family		2.39 (1.42)		3.73** (1.69)		1.88† (0.71)
	Community ties						
	On reserve		1.49 (0.56)		1.12 (0.34)		0.77 (0.18)
	Off reserve		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Arctic		0.61		0.30**		0.26***

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
			(0.35)		(0.13)		(0.08)
	Labour force participation						
	Employed		0.35** (0.14)		2.78*** (0.80)		1.54 (0.42)
	Unemployed		0.17** (0.10)		1.76 (0.67)		0.97 (0.30)
	Not in labour force		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Family income (in thousands)						
	< \$10		0.23 <sup>†</sup> (0.18)		0.28* (0.14)		0.47 <sup>†</sup> (0.20)
	\$10 – 29		0.55 (0.32)		0.42* (0.18)		0.75 (0.28)
	\$30 – 59		1.31 (0.70)		1.02 (0.44)		0.85 (0.32)
	\$60 +		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Social support		1.02 (0.02)		1.05* (0.02)		1.04** (0.01)
	Social cohesion		0.96 (0.08)		1.04 (0.07)		0.97 (0.05)

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	<i>N</i>	3,140	1,430	3,140	1,430	3,140	1,430
	Model statistics – base						
	Likelihood-ratio chi-square	92.48 <sup>***</sup>					
	<i>df</i>	12					
	McFadden’s R <sup>2</sup>	0.014					
	McFadden’s adjusted R <sup>2</sup>	0.008					
	Model statistics – full						
	Likelihood-ratio chi-square	325.29 <sup>***</sup>					
	<i>df</i>	51					
	McFadden’s R <sup>2</sup>	0.11					
	McFadden’s adjusted R <sup>2</sup>	0.06					
	Difference (full – base)						
	Likelihood-ratio chi-square	232.81 <sup>***</sup>					
	<i>df</i>	39					
	McFadden’s R <sup>2</sup>	0.09					
	McFadden’s adjusted R <sup>2</sup>	0.05					

*Note.* Odds ratios with standard errors in parentheses. Reference category is high school drop-out.

†  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Table 3

## Imputed Hierarchical Multinomial Regression Tables Predicting Educational Attainment by Residential Mobility

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
15 - 19	Number of moves						
	Never	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
	Zero	1.54* (0.34)	1.56* (0.34)	1.32 (0.36)	1.25 (0.34)	1.58 (0.46)	1.50 (0.42)
	One	1.19 (0.27)	1.16 (0.27)	2.03* (0.56)	2.04* (0.59)	2.09** (0.58)	1.92* (0.56)
	Two	0.95 (0.30)	1.37 (0.46)	1.26 (0.55)	1.78 (0.78)	1.88 (0.72)	2.58* (1.03)
	Three +	0.41** (0.12)	0.56† (0.19)	0.58 (0.24)	0.64 (0.28)	0.60 (0.20)	0.66 (0.24)
	Sex						
	Male		0.68* (0.11)		0.70† (0.15)		0.59* (0.13)
	Female		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Family structure						
	Child		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>



Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Married / common-law		0.11 <sup>***</sup> (0.05)		0.64 (0.33)		0.60 (0.30)
	Lone parent		0.14 <sup>***</sup> (0.07)		0.19 <sup>**</sup> (0.10)		0.19 <sup>**</sup> (0.09)
	Non-family		0.61 <sup>†</sup> (0.17)		1.05 (0.35)		2.19 <sup>*</sup> (0.69)
	Community ties						
	On reserve		0.60 <sup>**</sup> (0.10)		0.48 <sup>**</sup> (0.13)		0.58 <sup>†</sup> (0.17)
	Off reserve		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Arctic		0.43 <sup>***</sup> (0.08)		0.21 <sup>***</sup> (0.06)		0.23 <sup>***</sup> (0.07)
	Labour force participation						
	Employed		0.28 <sup>***</sup> (0.05)		1.84 <sup>*</sup> (0.50)		0.73 (0.18)
	Unemployed		0.27 <sup>***</sup> (0.06)		1.07 (0.35)		0.40 <sup>**</sup> (0.12)
	Not in labour force		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Family income (in thousands)						
	< \$10		0.41** (0.12)		0.35** (0.13)		0.17*** (0.06)
	\$10 – 29		0.33*** (0.08)		0.23*** (0.08)		0.15*** (0.05)
	\$30 – 59		0.55** (0.12)		0.50** (0.13)		0.35*** (0.09)
	\$60 +		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Social support		1.04*** (0.01)		1.06** (0.02)		1.03* (0.02)
	Social cohesion		0.98 (0.05)		0.92 (0.06)		0.89 (0.06)
	<i>N</i>	4,280	4,280	4,280	4,280	4,280	4,280
20 – 24	Number of moves						
	Never	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
	Zero	2.05 <sup>†</sup> (0.84)	1.81 (0.70)	1.10 (0.29)	0.89 (0.24)	1.26 (0.27)	1.02 (0.24)

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	One	1.10 (0.41)	1.01 (0.38)	1.07 (0.27)	0.80 (0.21)	2.01** (0.43)	1.47† (0.33)
	Two	1.08 (0.90)	0.90 (0.69)	1.02 (0.39)	0.86 (0.34)	2.31** (0.57)	1.84* (0.45)
	Three +	2.82* (1.24)	2.65* (1.20)	1.72† (0.56)	1.53 (0.48)	1.92** (0.39)	1.84** (0.42)
	Sex						
	Male		1.08 (0.39)		0.69† (0.14)		0.44*** (0.07)
	Female		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Family structure						
	Child		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Married / common-law		1.33 (0.51)		1.08 (0.27)		0.66† (0.14)
	Lone parent		2.24† (1.05)		1.78 (0.66)		0.71 (0.21)
	Non-family		1.41 (0.73)		2.19* (0.68)		1.96* (0.53)
	Community ties						

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	On reserve		0.73 (0.24)		0.65 <sup>†</sup> (0.15)		0.54 <sup>***</sup> (0.08)
	Off reserve		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Arctic		0.58 (0.20)		0.24 <sup>***</sup> (0.07)		0.19 <sup>***</sup> (0.04)
	Labour force participation						
	Employed		0.47 <sup>*</sup> (0.15)		2.63 <sup>***</sup> (0.61)		1.76 <sup>**</sup> (0.32)
	Unemployed		0.26 <sup>*</sup> (0.16)		1.23 (0.34)		0.82 (0.18)
	Not in labour force		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>
	Family income (in thousands)						
	< \$10		0.98 (0.57)		0.40 <sup>**</sup> (0.14)		0.45 <sup>**</sup> (0.13)
	\$10 – 29		0.73 (0.34)		0.74 (0.22)		0.66 <sup>†</sup> (0.16)
	\$30 – 59		0.62 (0.25)		0.85 (0.24)		0.82 (0.21)
	\$60 +		<i>Ref.</i>		<i>Ref.</i>		<i>Ref.</i>

Cohort	Variables	Non-graduate		Graduate		Post-secondary	
		Base	Full	Base	Full	Base	Full
	Social support		1.00 (0.02)		1.03* (0.02)		1.05*** (0.01)
	Social cohesion		0.87 (0.09)		1.02 (0.07)		0.99 (0.05)
	<i>N</i>	3,350	3,350	3,350	3,350	3,350	3,350

*Note.* Odds ratios with standard errors in parentheses. Reference category is high school drop-out.

†  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

never moved. The odds ratios for zero and three plus moves remained significant in the full model with controls. When we compare odds ratios for being a graduate versus being a drop-out, those who had moved once had two times higher odds of being a graduate. This effect remained significant in the full imputed model. In the full unimputed model, those who had moved three or more times had 83% lower odds of being a graduate. The odds ratio was not significant in the base model, which suggests suppressor effects (Menard, 2002). When comparing the odds of attending post-secondary relative to dropping out, those who had moved once had double the odds of post-secondary. In the full unimputed model, those who had not moved in the past five years had three times the odds of having post-secondary. In the full imputed model, those who had moved twice had 2.5 times higher odds of having post-secondary. Both odds ratios were not significant in the base model, which suggests suppressor effects.

The odds of being in the higher educational category relative to being a drop-out were significantly lower for males compared to females in the imputed model. While the direction was the same the odds ratios did not reach statistical significance in the unimputed model.

The odds ratios for family structure suggest that 15 to 19 year-olds who are married or living common-law have approximately 90% lower odds, while lone parents have about 88% lower odds, of being a non-graduate compared to those who are living with their parents. In the imputed model, those who were living in non-family situations also had lower odds of being non-graduates compared to those in the child category. Contrasting the odds of being a graduate to a drop-out, those who were lone parents had significantly lower odds of being a graduate compared to those in the child category in

the imputed model. Similarly, compared to those living at home, lone parents had lower odds of having post-secondary in both the unimputed and imputed models. In contrast, those in non-family households had twice the odds of having post-secondary compared to those living at home in the imputed model.

The odds ratios for community ties suggest that those with stronger ties to reserve or Arctic communities have lower odds of being non-graduates compared to those with stronger ties off reserve. The same odds ratios are found at the graduate and post-secondary, although the on reserve odds ratios are only significant in the imputed model.

Compared to those who are not in the labour force, those who are employed or unemployed having significantly lower odds of being non-graduates relative to drop-outs. However, those who are employed, compared to those who are out of the labour force, have 84% higher odds of being a graduate, according to the imputed model. Those who are unemployed have lower relative odds of being in post-secondary.

Family income also influenced the relative odds of higher educational attainment. Those with a family income below \$60,000 had lower relative odds of being in the higher educational category compared to those in the \$60,000 plus category. The contrast between those in the second highest and highest income categories was not significant in the unimputed model.

Each unit increase in social support significantly increased the odds of higher educational attainment by between 3% and 9%. The results for social cohesion were not significant with the exception of the odds ratio comparing post-secondary and drop-out, which, unexpectedly, showed a significant decrease in the odds of having post-secondary as cohesion increased.

Measures of model fit suggest that mobility alone significantly improves prediction over an intercept only model. The addition of control variables in the full model significantly improves prediction over the base model. The variance in education status accounted for also improves with the addition of control variables.

*20 to 24 age cohort.* In the base model, those who have not moved in the past five years had two times greater odds of being a non-graduate compared to those who have never moved. The odds ratio remained significant and increased in magnitude with the addition of controls in the full unimputed model. There were no differences in the odds of being a non-graduate between those who had moved once or twice and those who had never moved. Respondents who had moved three or more times had almost three times higher odds than those who had never moved of being in the non-graduate category. The effect remained significant with the addition of control variables in both the unimputed and imputed models. Frequent movers were also more likely to be a high school graduate compared to those who had never moved. The effect remained significant in the unimputed full model. At the post-secondary level, those who had moved once in the past five years had two times higher odds of post-secondary compared to non-movers. The odds ratio was also significant in the imputed full model. Respondents who moved two or three or more times had approximately double the odds of having some level of post-secondary compared to those who had never moved. The odds ratios in both the base and full models were significant.

The control variables included in the full model suggest that males had significantly lower odds compared to females of being a high school graduate or post-secondary attendee. In the unimputed model, males were also less likely to be a non-



graduate; however, in the imputed model the odds ratio indicated higher odds, but was not significant.

Family structure also affected the odds of higher educational attainment. Respondents who were lone parents had two to three times higher odds of being non-graduates compared to those who were still living with their parents. Those living in non-family households had substantially higher odds of having graduated from high school compared to adult children living with parents. In the imputed model, young adults who were married or living common-law were less likely to be attending post-secondary. Respondents living in non-family households had nearly twice the odds of being in post-secondary in both the unimputed and imputed models.

There were no significant differences in the odds of being a non-graduate relative to drop-outs by community ties; however in the imputed model those who had stronger ties on reserve were less likely to be a high school graduate or attend post-secondary. Those who lived in the Arctic also had lower odds of being a high school graduate or having post-secondary compared to those with stronger ties off reserve in both unimputed and imputed models.

Compared to those who were not in the labour force, respondents who were employed or unemployed had lower relative odds of being non-graduates. On the other hand, those who were employed were more likely to be high school graduates or attending post-secondary.

In the unimputed model, respondents in the lowest income category had lower odds of being a non-graduate relative to being a drop-out compared to those in the highest income category. Low family income also predicted lower odds of graduation or

post-secondary compared to those with a family income of \$60,000 or more. Those with a family income between \$10,000 and \$29,000 also had significantly lower odds of being a graduate in the unimputed model and lower odds of being in post-secondary according to the imputed model.

Higher levels of social support improved the odds of having a high school diploma or attending post-secondary by between 3% and 5% for each unit increase. There were no significant differences by social cohesion score.

Measures of model fit suggest that mobility alone significantly improved prediction of educational level compared to an intercept only model. The addition of control variables significantly improved prediction over the base model.

## Discussion

Despite data limitations, the conceptual model proposed has the potential to assist researchers in unravelling the complex relationships between mobility, social capital, social cohesion, and social and economic outcomes. Based on these analyses, it appears that movement is a double edge sword with respect to educational attainment. The results suggest that among 15 to 19 year-olds, frequent moves increase the likelihood of dropping out of secondary school. However, some movement in the respondent's lifetime was associated with the highest odds of attending post-secondary. The odds of staying in school, graduating, and continuing on to post-secondary are higher among those who move less frequently. However, those who had moved either in their lifetime or in the past five years had higher odds of graduating or attending post-secondary compared to non-movers, which suggests that some movement is not disruptive during educational transitions and may normatively accompany the completion of high school.

The picture seems to be that, among adolescents, residential stability, living with parents or guardians, and being out of the labour force is beneficial in terms of staying in secondary school. This pattern is quite consistent with our basic model. However, following the completion of school, moving may be part of pursuing employment or post-secondary educational opportunities. This period of pursuing opportunities may involve several moves without significant detriment to educational attainment. However, forming families early, either by partnering or parenting, is associated with frequent moves  $\chi^2 = 214.84, p < .001$  ( $z = 11.03, p < .001$  for married and  $z = 8.71, p < .001$  for lone parents in the 3 or more moves category) and lower levels of attainment  $\chi^2 = 149.16, p < .001$  ( $z = 7.79, p < .001$  for married and  $z = 5.08, p < .001$  for lone parents in the drop-out category). Hull (2005) also found that lone parenthood was a barrier to higher education among 15 to 24 year-olds.

In the older group, the pattern was more complex. Those who moved three or more times in the past five years had the highest odds of being a non-graduate compared to non-movers. If we use the results from the younger cohort to provide context, we can speculate that some of these individuals were also frequent movers when they were younger and may have fallen behind their peers or dropped out and subsequently returned. On the other hand, having moved in the past five years was associated with higher odds of attending post-secondary compared to non-movers. Having never moved by this age may be the result of a lack of opportunities for higher education or employment that make the completion of high school less advantageous. Longitudinal data is needed to trace moving patterns across childhood and adolescence and its relationship to cumulative advantage or disadvantage. These findings reinforce the

conclusion that some movement in order to pursue opportunities is advantageous with respect to educational attainment. Another possibility suggested in the literature is that strong bonding ties may be detrimental when group norms discourage the pursuit of higher education (White, Spence, & Maxim, 2005). Movement may serve to break or weaken bonding ties in order to minimize pressures to maintain lower educational norms. Studies of the Aboriginal cohort in the Youth in Transition Survey (YITS) confirms a connection between parents' attitudes toward education and educational attainment (Maxim & White, 2006). No suitable data was available to test what proportion of young people may have moved for this reason. In other cases, strong bonding capital is an asset. For example, those with strong bonding social capital networks that are linked to resources and bridged with other educational institutions tend to have positive effects on the graduate rate and transition to post-secondary (White et al., 2005). More direct measures of the types and characteristics of social capital are needed to uncover the dynamics that influence attainment.

Males in the older cohort have lower odds of higher educational attainment compared to females. The odds were also lower, and in the imputed model significantly so, for males in the younger cohort as well. Further research is needed to understand the gender-specific barriers that tend to disadvantage Aboriginal men.

In terms of family status, compared to those living with parents, individuals with their own families were much less likely to attend post-secondary while those in non-family arrangements were more likely to have either graduated or pursued post-secondary. Therefore, these results suggest that continuing to live at home following graduation or while pursuing post-secondary is less normative. Even in this older cohort,

family formation decreases the odds of pursuing higher education. What we cannot tell from this data is whether there is a difference between those who became a partner or parent during adolescence versus those who made this transition as an adult. It is more common among Aboriginals, especially Aboriginal women, to form families early (Anderson, 2002) and attend post-secondary later on (Clement, 2009). Therefore, if we were able to look at these individuals later in adulthood, the differences in educational attainment may be less dramatic. The relationship between moving and family status reveal that those who have never moved are more likely to be living with parents ( $z = 10.34, p < .001$ ). In this age group, couples ( $z = 2.46, p = .007$ ) and persons in non-families ( $z = 3.91, p < .001$ ) tend to move the most. Interestingly, lone parents are overrepresented in the zero moves in the past five years category ( $z = 1.93, p < .03$ ).

In this age group, compared to being out of the labour force, employment is related to higher odds of post-secondary graduation and continuing on to post-secondary. However, it also appears that being in the labour force is associated with dropping out of high school. What we cannot determine is whether the need to find employment was a factor in the decision to drop-out. It seems in this age group, employment is associated with higher odds of educational attainment. In fact, a reverse causation explanation is possible with those who completed high school or trade, college, or university training being more likely to find employment.

A few findings were consistent in both cohorts. Living in the Arctic was associated with lower odds of higher educational attainment compared to those with stronger off reserve ties. Imputed results suggest that those with stronger ties reserve also have lower odds of higher educational attainment; however, this finding may be a

function of either the pattern of missing data or the model used in the imputation. It is consistent with other research showing lower educational attainment among Registered Indians (Hull, 2005). Given that those in the Arctic are overrepresented among those who have never moved, it appears that churn migration is not a significant factor in explaining educational attainment levels.

It is also the case that higher economic family incomes are associated with better odds of higher educational attainment in both cohorts, which suggests disadvantages associated with poverty, lack of faith that higher education will have tangible pay-offs, and/or pressures to make money interfere with school completion. Future research may shed light on what distinguishes those who complete secondary from those who drop-out within the same socioeconomic strata.

One of the more dramatic findings was the increased odds of higher educational attainment as social support levels increased, which implies that social capital networks that enable individuals to access positive forms of support are essential. To what extent support may buffer the negative effects of socioeconomic disadvantage and mobility are questions for future research.

The lack of significant findings for social cohesion warrants comment. Unfortunately, the only measures available in the APS PUMF, which are essentially types of social disorder, capture only the negative extreme of the concept's valence. These variables miss positive dimensions of cohesion, such as participation in community life, sense of belonging, and levels of trust. Two key dimensions mentioned in the literature include inequalities and social exclusion, and the strength of social relations, interactions, and ties (Beauvais & Jenson, 2002).. Since cohesion is a multifaceted concept, measures

that tap into different dimensions may provide a deeper understanding of how it operates. Better concept measurement is needed before we declare cohesion to be unrelated to educational attainment. The large amount of missing data is also problematic in terms of drawing sound conclusions.

#### Directions for Future Research

An important limitation of this research is that it is cross-sectional. The life course perspective (see for example Elder et al., 2003) can help us situate individuals within contexts of their own and family life history and historical period. In particular, by taking a long view of personal history, we can examine how movers and non-movers differ prior to moves. We can also examine the effect of mobility history rather than mobility within a limited time period. We may discover there are different consequences depending on whether moves are normatively or non-normatively timed. It may also matter what triggers the move and what other events are occurring within the family or community. For example, the consequences of mobility may be particularly negative when triggered and/or accompanied by marital breakdown. The life course would also enable us to link family members' personal histories in order to understand these interrelated dynamics.

The literature has suggested important interaction effects with family structure. Research on children has suggested that high mobility is not detrimental to school performance among children who live with both biological parents, while any mobility negatively affected children living in other family structures (Tucker, Marx, & Long, 1998). It may be that family transitions reduce human and social capital, which creates conditions in which the loss of community capital is injurious to educational outcomes (Hagan, MacMillan, & Wheaton, 1996; Tucker et al., 1998). In addition, we know little

about the long-term effects of mobility in childhood. Hango (2006) used data from the 1986 Canadian General Social Survey (GSS) to examine the impact of childhood mobility on educational attainment among 25 to 79 year-olds. The results suggested that for most individuals the positive benefits of childhood mobility outweighed the potential negative losses of social ties in the short-term and heightened stress. Over the long-run, living in more than one community before the age of 15 had a positive effect on educational attainment. However, it is important to note that longer-distance moves were more common among higher socioeconomic status families. These findings further stress the potentially important effects of the impetus for the move, family characteristics, and resources available in the new location.

Research has suggested that groups that are prone to exclusion, which include Aboriginal peoples, may have strong bonding social capital, but lack bridging ties with other social groups or local institutions and linking ties with powerful social organizations and institutions (Policy Research Initiative Project, 2005). Our measure of social capital primarily taps into positive bonding dimensions, but does not capture the role of negative aspects of bonding, nor bridging or linking ties. Future research can examine how bridging and linking social capital may be affected by sociodemographic characteristics and mobility, and, in turn, influence social and economic outcomes. “Understanding the contextual conditions in migration decision making is also necessary if we are to identify the types of policies that could make migration transitions easier to the individuals involved” (Cooke & Belanger, 2006, p. 159).



## Policy Implications

The analyses presented here along with the findings of other scholars suggests that there is a distinction between moves in which people are forced to leave, in order to find housing, escape violence, access services or supports, for example, and those in which people choose to leave to pursue opportunities that are perceived to have long-term benefits, such as pursuing higher education and better employment. If this is the case, then policy can reduce forced mobility by providing resources such as suitable and affordable housing; or protection, services, and support for those who are leaving abusive situations. It can also facilitate movement among those who are pursuing opportunities by providing things such as financial support and programs to remove or reduce barriers. In both cases, the key is to assist individuals in maintaining existing ties and building new ones within new communities. Linking individuals to local institutions may be particularly important for achieving goals related to employment or education. There is also a need to provide services with a family focus since residential changes often are precipitated by changes in family structure or function. Appropriate supports for parents and children may reduce the negative effects of breaking social and community ties.

Putnam (1993) argued “social capital is not a substitute for effective public policy but rather a prerequisite for it and, in part, a consequence of it” (Social capital and America’s ills, ¶ 14). The Policy Research Initiative Project (2005) concluded that social capital perspectives are particularly useful in addressing the needs of populations at risk of exclusion, during life transitions, and in promoting community development. Social policy can assist citizens to acquire human and social capital, which enable them to fully participate in their communities and nations (Policy Research Initiative Project, 2005).

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## CHAPTER 6

### Conclusion

Social determinants of health are:

...the social and economic conditions that influence the health of individuals, communities, and jurisdictions as a whole. Social determinants of health determine whether individuals stay healthy or become ill (a narrow definition of health). Social determinants of health also determine the extent to which a person possesses the physical, social, and personal resources to identify and achieve personal aspirations, satisfy needs, and cope with the environment (a broader definition of health. Social determinants of health are about the quantity and quality of a variety of resources that a society makes available to its members. (Raphael, 2004, p. 1)

The articles presented here support the contention that the health and well-being of the Aboriginal population is tied to, although not solely determined by, their social and economic positions. The literature suggests that Aboriginal populations, particularly those for which the Federal Government of Canada assumes primary responsibility, have not shared equitably in Canada's prosperity (see for example Statistics Canada, 2009b). However, those with Aboriginal identity who do occupy positions of relative advantage tend to have better health outcomes compared to their lower status peers. The chapters on educational attainment also suggest that where a respondent lives, whether on reserve, off reserve, or in the Arctic, influences life choices and chances in ways that very likely impact health and well-being. The results echo social determinants frameworks, which suggest that to root of disparities in health and well-being lie in the everyday conditions



in which people live, which are the product of their access to transferable resources such as money, knowledge, and social networks (Commission on Social Determinants of Health, 2008).

### Summary of Findings and Policy Implications

Chapter 2 suggests that basic community socioeconomic conditions, including rates of literacy, high school graduation, income, labour force participation, employment, and the condition of housing, correspond to residents' subjective assessments of their own communities and their own well-being. Furthermore, First Nations rate these dimensions of their communities as being of high priority. While increases in Federal Government funding may produce short-term benefits in some areas, such as the quality of housing, developing economic opportunities in order to provide incentives for higher education and increase employment and income are also necessary. Partnerships between First Nations communities, the private sector, and government are likely needed to develop economic projects that fit with the values and worldview of First Nations. These arrangements must also ensure the bulk of the profits stay within the community. First Nations governments need to impose mechanisms to distribute financial windfalls from such projects equitably in order to improve the well-being of the community as a whole. However, it also appears there are costs associated with greater contact with non-Aboriginal society, such as loss of traditional language fluency and discrimination for example. The literature suggests that connection to culture acts as a buffer against the negative effects of discrimination (Whitbeck, McMorris, Hoyt, Stubben, & LaFramboise, 2002). Support for cultural revitalization may be necessary to offset the potential negative side effects of stronger economic and social integration.

Chapter 3 highlights that not all segments of the Aboriginal population are equally disadvantaged. Those in positions of relative social disadvantage tend to have higher levels of stress and fewer psychosocial coping resources, which increase psychological distress and decrease well-being levels. However, it is also clear that not all social statuses are equally relevant for each mediating process. For example, there were significant gender differences in stress and mastery levels, but not social support. The results suggest that those with multiple sources of disadvantage are at greatest risk of poor mental health outcomes. Short-term solutions may include programs that increase coping resources, such as providing social support. Longer-term solutions require social and policy changes that reduce the burden of stress associated with social status and remove barriers to status attainment, such as higher education. Both Chapters 2 and 3 suggest that socioeconomic conditions pattern the availability of social supports, which are also associated with health and well-being. We need further research to understand how material conditions influence availability and access to social supports, as well as the positive or negative consequences of the support received.

Improving educational attainment is an important strategy for reducing inequalities for a number of reasons. First, it is directly or indirectly associated with a wide range of positive outcomes, including health and well-being. Second, it provides additional benefits through its association with employment, occupation, and income. Third, it is associated with psychosocial resources, such as mastery, which enable or empower people in improving their own life choices or chances. It also provides individuals with the necessary skills to effectively access resources in a knowledge-based economic system. Fourth, in the future, there will be strong demand for young, educated

and skilled workers. The relative youthfulness of the Aboriginal population makes it an important potential resource for the Canadian labour force. Aboriginal youth and young adults with educational credentials will be uniquely poised to take advantage of these opportunities (Hull, 2008). Finally, Aboriginal communities see improving educational outcomes as a way of improving social and economic conditions, achieving self-governance, and participating fully in Canadian society (Royal Commission on Aboriginal Peoples, 1996).

The final two articles address potential barriers to educational attainment that are unique to or more prevalent among Aboriginal populations. Chapter 4 examines the intergenerational legacy of residential schools on educational attainment among First Nations adults. Surprisingly, there is no clear pattern of disadvantage among intergenerational Survivors compared to those without familial histories of attendance. The results suggest attendance or non-attendance across generations is a poor predictor of attainment. It may be that those who experienced the greatest trauma, lived in disadvantaged circumstances either before or after attending residential school, and had the fewest resources and supports to facilitate healing were less likely to complete their educations. These individuals would also be most likely to transmit the trauma they experienced to subsequent generations. We need better data about potential mediators and moderators between intergenerational residential school exposure and educational outcomes.

Chapter 5 examined whether the higher rate of mobility in the Aboriginal population predicted educational status among adolescents and young adults living off reserve. It proposed that frequent moves break social capital bonds and contribute to a

lack of social cohesion in the community, which contributes to a lack of access and connection to community institutions including schools. The results suggest that mobility is a double-edged sword. Among adolescents, frequent moves are associated with higher odds of dropping out of school. However, lower levels of mobility are not detrimental to education and are associated with pursuing post-secondary. Among young adults, frequent movers had higher odds of being non-graduates, which puts them behind their cohort in terms of educational progress. On the other hand, having never moved was associated with lower odds of being in a post-secondary program. It appears that movement is a normative part of pursuing educational opportunities while never moving may be associated with a lack of opportunities or significant barriers to them. The results support the conclusion that those from higher income families are more likely to attain higher levels of education. However, social support also increased the odds of higher educational attainment. To what extent social support can buffer against the negative effects of poorer material circumstances is a question for future research. Social cohesion was not a significant predictor likely because the measure only taps into social problems, which capture only the negative extreme of the concept. However, better measures of cohesion are needed before we dismiss it as a part of the explanation.

#### Directions for Future Research

Where do we go from here? One of the major limiting factors in conducting research on Aboriginal peoples in Canada is the limited data available. In the past, both the Census and the Aboriginal Peoples Survey (APS) have been the primary sources of data on demographic, social, economic, and cultural trends among Aboriginal peoples, including the on reserve population. Beginning with the 2006 cycle, the APS excluded

the on reserve or Indian Settlement populations (Statistics Canada, 2009a). More recently, the Government of Canada under Prime Minister Stephen Harper replaced the mandatory long-form questionnaire with the voluntary National Household Survey (NHS) for the 2011 Census (Statistics Canada, 2010). While the short-form questionnaire remains mandatory, it contains no questions about Aboriginal identity or ancestry. Given that these questions were the basis of the sampling frame for the APS, the quality of data in future cycles of the APS is severely compromised. The APS is one of the few national surveys with a large enough sample to run complex analyses; however, the data in the survey tends to be descriptive in nature rather than based on theoretical or conceptual models. Given the importance of the APS as a source of data about Aboriginal peoples in Canada, it makes sense to expand rather than reduce its scope. The model used in the Canadian Community Health Survey (CCHS), which collects basic population data in the main cycle and follows it with a smaller-scale, in-depth survey about a specific topic, such as mental health, in between cycles, would be a way of keeping basic population data while also probing theoretically driven questions.

While Canada's other national social and health surveys provide rich data, most have small samples of Aboriginal people, which most often exclude residents of reserve communities. They also do not contain measures specific to or adapted for the Aboriginal population. The lack of data about culture is particularly limiting. In addition, many do not allow analyses by identity group. Given that we know there are different population profiles by Aboriginal identity, we may be missing important differences between groups.

There is also a need for life course data in order to begin to examine processes that occur over time, across generations, and contexts. Quantitative life course analyses require longitudinal data often spanning at least a decade and at least two generations. Currently, there are no national longitudinal surveys that include a large sample of Aboriginal persons or communities. Even retrospective data about key developmental periods would be an advancement over single point in time measures.

One of the major limitations on our ability to draw sound conclusions from analyses is the large amount of missing data, particularly on sensitive variables such as residential school attendance or community social problems. It is clear that Statistics Canada and other agencies that conduct surveys of the Aboriginal population need to better understand the reasons why respondents choose not to participate at all or not provide responses to specific questions. This information is invaluable in designing surveys and developing methodologies that are viewed as important, valuable, trustworthy, culturally appropriate, and sensitive by Aboriginal respondents. Ensuring that research produces tangible benefits for communities or organizations may help increase interest and willingness to participate. Developing meaningful partnerships with Aboriginal communities and organizations may be the best way to achieve these goals.

Aboriginal people stress the importance of culture in their worldview and experiences. However, data limitations generally restrict the conceptualization of culture to ability to speak an Aboriginal language. This variable was found to be negatively associated with educational attainment. While it makes sense that individuals who *only* speak an Aboriginal language would have lower educational attainment since most educational programs require proficiency in one of Canada's official languages. The vast

majority of Aboriginal language speakers also speak either English or French (Statistics Canada, 2008). It makes little theoretical sense that being bi- or multilingual would impede educational attainment. It seems quite likely that the relationship is spurious; that is differences in who learns and retains an Aboriginal language explain the association. We know that Aboriginal language fluency is associated with age, living on reserve, particularly in a Northern, isolated, or remote location (Norris, 1998; RHS National Team, 2007; Statistics Canada, 2003). It appears that the appropriate variables were not available to adequately control for these differences between speakers and non-speakers. We may see a change in the relationship between traditional language knowledge and educational attainment as school or community-based programs bring the opportunity to learn traditional languages to Aboriginal children living off reserve and on reserves in closer proximity to urban centres. Language also represents only one dimension of culture. It is possible for individuals to have a strong connection to their culture without speaking their language. Participation in traditional activities, ceremonies, or rituals, studying traditional sources of knowledge, or engaging with or in traditional art forms all represent other ways in which people connect to their cultures. Data about these other forms would enable us to develop composite indicators that better reflect the range of cultural engagement.

The quantitative work done to date has helped researchers understand the different Aboriginal population profiles and examined important theoretical, conceptual, or empirical questions. However, many of these analyses raise questions that are not readily answerable using quantitative data or statistical methods. There are many lingering how and why questions. We are often left to speculate about respondents'

perceptions, motivations, experiences, and interpretations. We often do not know whether the measures we use are valid and reliable among Aboriginal peoples. For example, do Aboriginal people conceptualize mental health in the same ways as population surveys? Are there differences among identity groups, nations, communities, or level of connection to traditional culture? Researchers also encounter the above mentioned difficulties with data limitations. Qualitative methods can help fill these knowledge gaps by enabling respondents to provide rich, detailed information about their perspectives and experiences. Participatory methods that involve partnerships with Aboriginal people, communities, or organizations provide a voice in developing research that matters to those involved, uses methods that are accepted as legitimate and trustworthy, and ensure the results have direct benefit.

Finally, insights from theory and research with non-Aboriginal populations can provide valuable frameworks for designing research and contextualizing or interpreting results. There are two caveats to this assertion. The first is that we must adapt models and measures to better fit the worldviews, realities, and experiences of Aboriginal peoples. For example, in applying the stress process model to Aboriginal populations, we must develop stress inventories that include stressors that are unique to or more prevalent in the population(s) we are studying. Stressors associated with colonialism, for example, may be particularly salient. Second, we must not ignore ways of knowing and understanding that come from traditional knowledge. Examining concordance and discordance between perspectives can help scholars develop a richer, deeper, more nuanced understanding of how well-being is cultivated.



Social determinants frameworks remind us that “if the major determinants of health are social, so must be the remedies” (Marmot, 2005, p. 1103). While spending on health care may address immediate needs, closing gaps in health and well-being in the long-term means investing in people and communities.

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