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

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**Abstract**

This article examines how the social structure distributes risk and protective factors and mental health outcomes within the off reserve Aboriginal population in Canada. It uses the stress process model, a prominent model in the sociology of mental health, to explore pathways between social status, stress, coping resources, and mental health outcomes. Path analyses are used to decompose total effects on distress and well-being into direct and indirect or mediating pathways. The results suggest that stress, mastery, and social support are important mediators between social status and mental health outcomes. Stress appears to be a stronger contributor to distress while mastery and social support are of higher relative importance to well-being.

**Keywords**

mental health, distress, well-being, stress process

Epidemiological data suggest that Aboriginal peoples in Canada have higher average 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). 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. Most research focussing on Aboriginal peoples has 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. 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 examined the pathways between social status and mental health among Aboriginal people. 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 and where intervention is possible.

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)

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, martial status, and occupation (Turner, Wheaton et al., 1995).

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, martial 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 most Aboriginal people are mentally healthy; however, 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[1] (Tjepkema, 2002).

There is also evidence that the consequences of mental illness are very serious. Measures of potential years of life lost[2] 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, Boothroyd, Tanner, Adelson, & Robinson, 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 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,

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[1] 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.
[2] 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.

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 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).

## Methods

### *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. 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 survey 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 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 ($N$ = 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). The "svy" commands in Stata 10 (StataCorp, 2007) were used.

Models with transformed variables to correct for non-normality, heteroskedasticity, and outliers 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 compared to untransformed models so the simpler, untransformed model was used (Tabachnick & Fidell, 2001). 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. Data were imputed using the imputation by chained equations (ICE) package for Stata (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).

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). 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. 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 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, 2003). 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
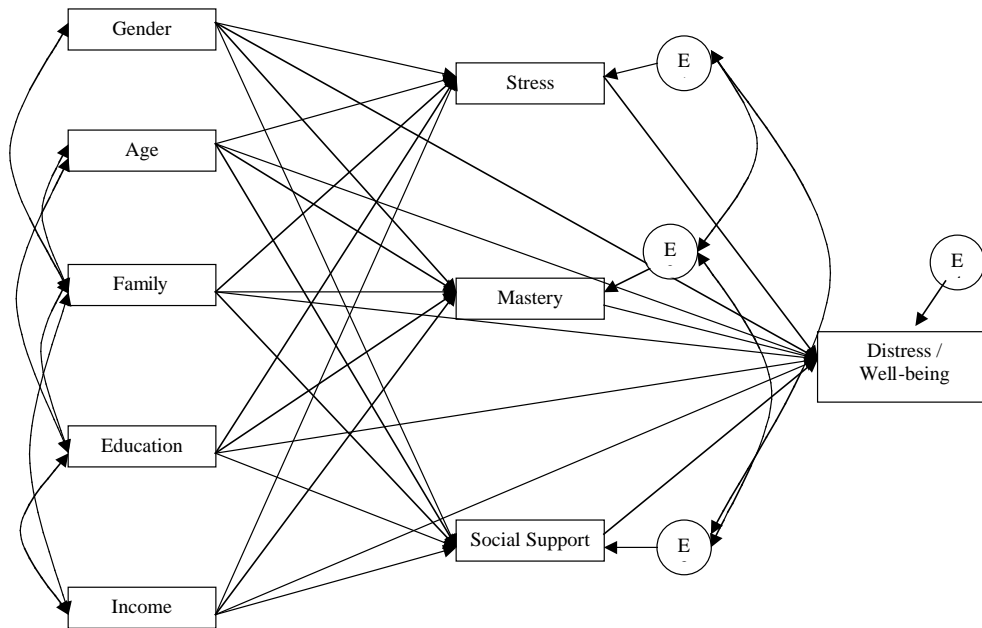


*Figure 1.* Path model: Distribution of stress, resources, and mental health outcomes by social status.

## Table 1

*Survey Weighted Sample Descriptives*

| | | Unimputed | | | | Imputed | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *n* | % | *M (SE)* | *Median* | *n* | %[1] | *M (SE)* | *Median* |
| 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 | | * | | | | |
| | 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 | | * |
| | 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 | | | - | - | | |
| 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 | |
| | | | (0.13) | | | | (0.14) | |
| 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 | | | | 7.08 | |
| | | | (0.31) | | | | (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 | | | | 79.49 | |
| | | | (0.74) | | | | (0.74) | |
| 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 *N* | 654.2 | | | | 654.2 | | | |

[1] Proportions are averaged across the five imputed data sets.

support. Similarly, the majority of respondents had low levels of distress and high levels of well-being.

*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 2. 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.

Figures 2 and 3 show the statistically significant direct paths for unimputed and imputed data respectively, which test the hypotheses about the social distribution of mediators and distress, as well as the relationships between mediators and distress. 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

Table 2

*Total Effect of Social Status Variables on Distress*

|  | Unimputed | Imputed |
|---|---|---|
| Male | -0.003 | -0.105[*] |
|  | (0.003) | (0.049) |
| Female | *Ref.* | *Ref.* |
| Age | -0.692[**] | -0.612[**] |
|  | (0.219) | (0.196) |
| Single | *Ref.* | *Ref.* |
| Couple | -0.005 | -0.096 |
|  | (0.004) | (0.082) |
| Single parent | -0.001 | -0.039 |
|  | (0.005) | (0.095) |
| Two parent | -0.009[*] | -0.165[*] |
|  | (0.004) | (0.073) |
| < High school | *Ref.* | *Ref.* |
| High school | -0.003 | -0.091 |
|  | (0.003) | (0.062) |
| Post-secondary | -0.008[*] | -0.169[**] |
|  | (0.003) | (0.062) |
| Income | -0.265[**] | -0.028[**] |
|  | (0.078) | (0.007) |
| Model $\chi^2$ (*df*) | 9.620 (5) | 5.585 (4) |
|  | *p* = 0.087 | *p* = 0.232 |
| *CFI* | 0.996 | 0.999 |
| *RMSEA* | 0.042 | 0.025 |
|  | *p* = 0.563 | *p* = 0.794 |
| *GFI* | 0.997 | 0.999 |

*Note.* Unstandardized regression coefficients with standard errors in parentheses. Standard errors generated using bootstrap method.
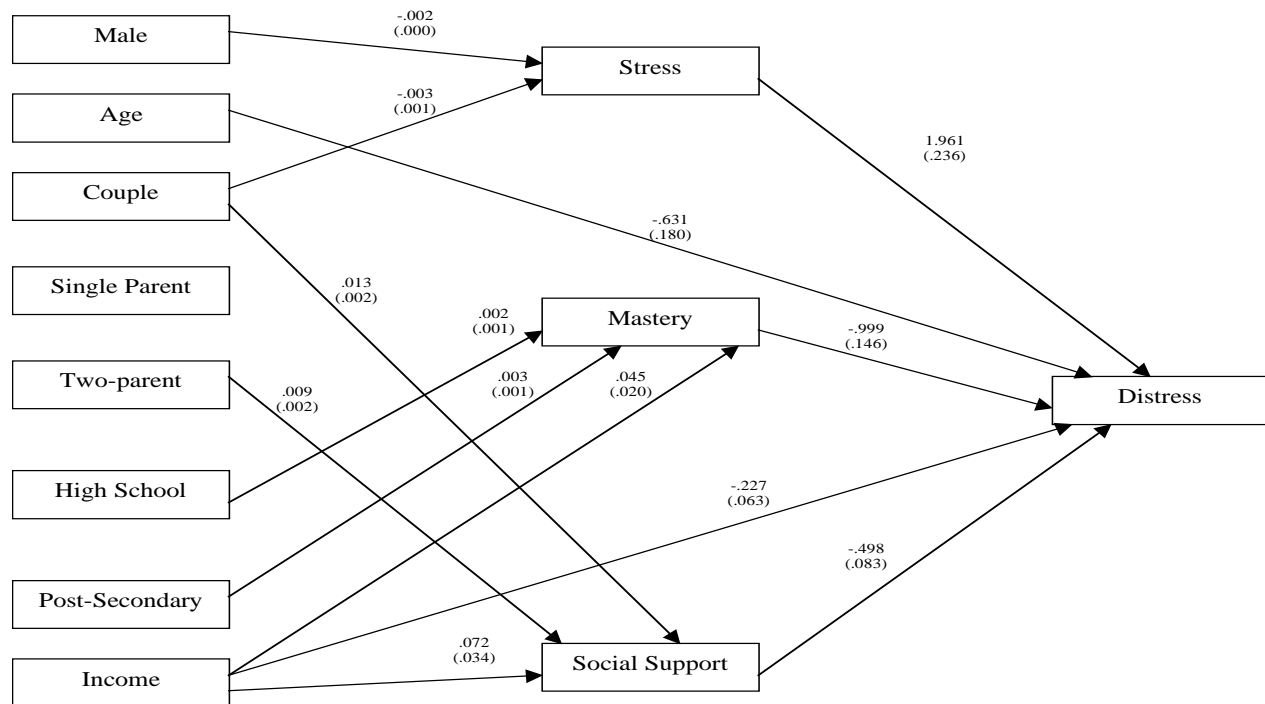[*]*p* < .05; [**]*p* < .01; [***]*p* < .001

*Figure 2.* Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and distress based on unimputed model
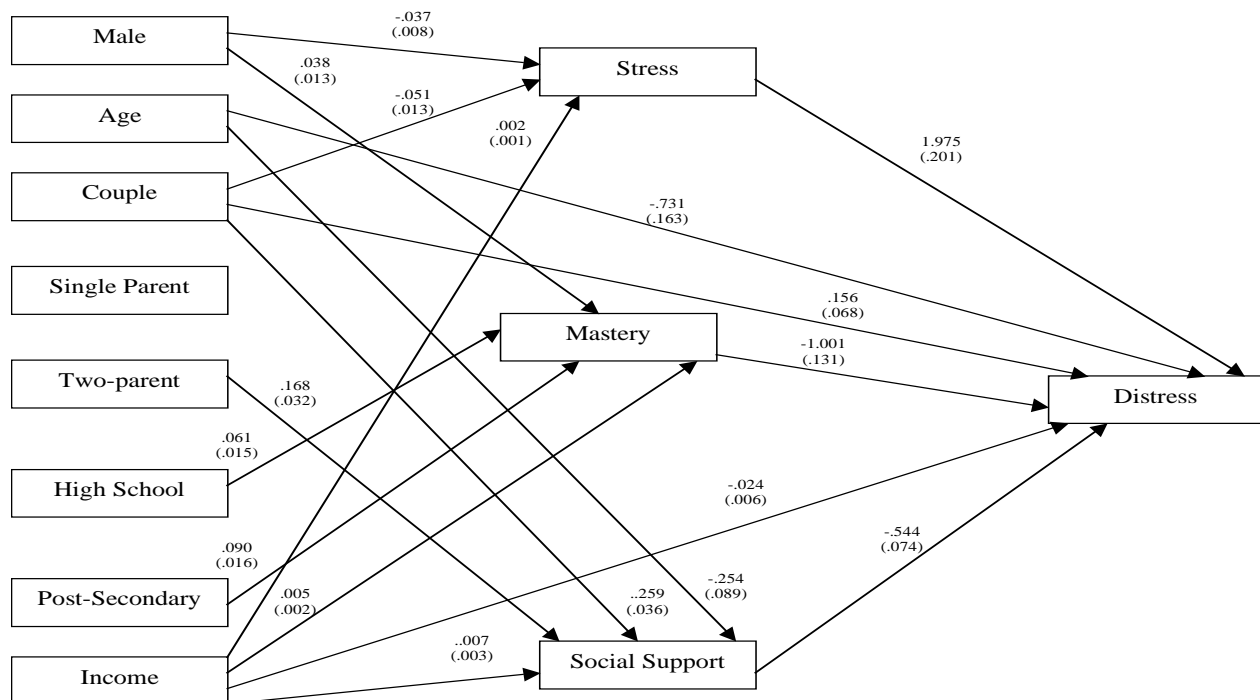
*Figure 3.* Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and distress based on imputed model.

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 3 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 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.

Table 3

*Indirect Effects of Social Statuses on Distress via Mediators*

| | Unimputed | | | | Imputed | | | |
|---|---|---|---|---|---|---|---|---|
| | Stress | Mastery | Social support | Total[a] indirect effect | Stress | Mastery | Social support | Total[a] indirect effect |
| Male | -0.0039*** (0.0004) | -0.0010 (0.0010) | 0.0005 (0.0005) | -0.004*** (0.002) | -0.0731*** (0.0175) | -0.0380** (0.0139) | 0.0060 (0.0120) | -.105*** (0.030) |
| Female | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* |
| 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** (0.0519) | .119 (0.117) |
| Single | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* |
| Couple | -0.0059** (0.0021) | -0.0010 (0.0010) | -.0065*** (0.0015) | -0.012** (0.003) | -0.1007*** (0.0276) | -0.0100 (0.0211) | -.1409*** (0.0274) | -.252** (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) | -.0045*** (0.0012) | -0.007** (0.002) | -0.0356 (0.0240) | -0.0060 (0.0180) | -0.0914*** (0.0214) | -0.133** (0.044) |
| < High school | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* |
| 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* x *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 *SEab = SQRT($b^2 SE^2_a$ + $a^2 SE^2_b$)* where *$SE_a$ and $SE_b$* are the standard errors for paths *a* and *b* respectively.
[a] Sum of all indirect pathways between social status variable and distress. Standard errors generated using bootstrap method.
*$p < .05$; **$p < .01$; ***$p < .001$

***Well-being.*** Table 4 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 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. 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.

Table 4

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

|  | Unimputed | Imputed |
|---|---|---|
| Male | 0.007* <br> (0.003) | 0.040** <br> (0.011) |
| Female | *Ref.* | *Ref.* |
| Age | 0.790** <br> (0.218) | 0.154** <br> (0.048) |
| Single | *Ref.* | *Ref.* |
| Couple | 0.007 <br> (0.004) | 0.031 <br> (0.019) |
| Single parent | 0.000 <br> (0.004) | 0.001 <br> (0.023) |
| Two parent | 0.008* <br> (0.004) | 0.041* <br> (0.017) |
| < High school | *Ref.* | *Ref.* |
| High school | -0.001 <br> (0.003) | 0.006 <br> (0.014) |
| Post-secondary | 0.007* <br> (0.003) | 0.037** <br> (0.014) |
| Income | 0.232** <br> (0.072) | 0.005** <br> (0.002) |
| Model $\chi^2$ (*df*) | 9.620 (5) <br> *p* = 0.087 | 5.585 (4) <br> *p* = 0.232 |
| *CFI* | 0.996 | 0.999 |
| *RMSEA* | 0.042 <br> *p* = 0.563 | 0.025 <br> *p* = 0.794 |
| *GFI* | 0.997 | 0.999 |

*Note.* Unstandardized regression coefficients with standard errors in parentheses. Standard errors generated using bootstrap method.
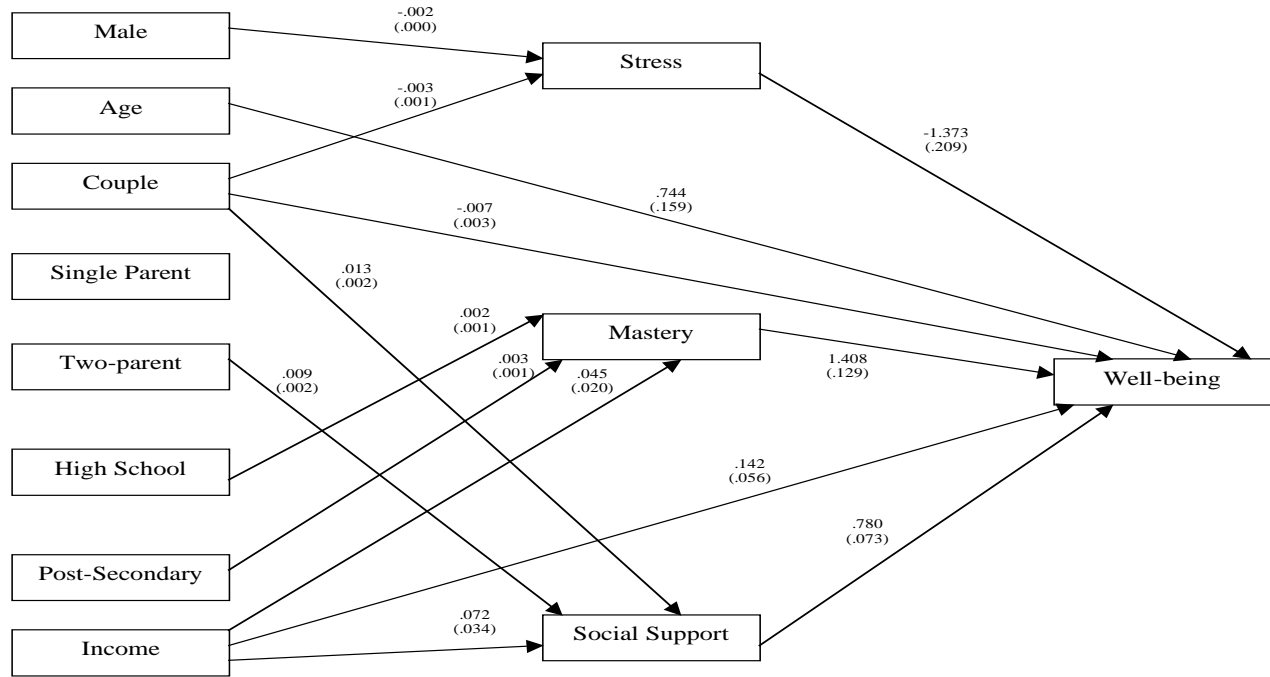*$p$ < .05; **$p$ < .01; ***$p$ < .001

*Figure 4.* Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and well-being based on unimputed model.
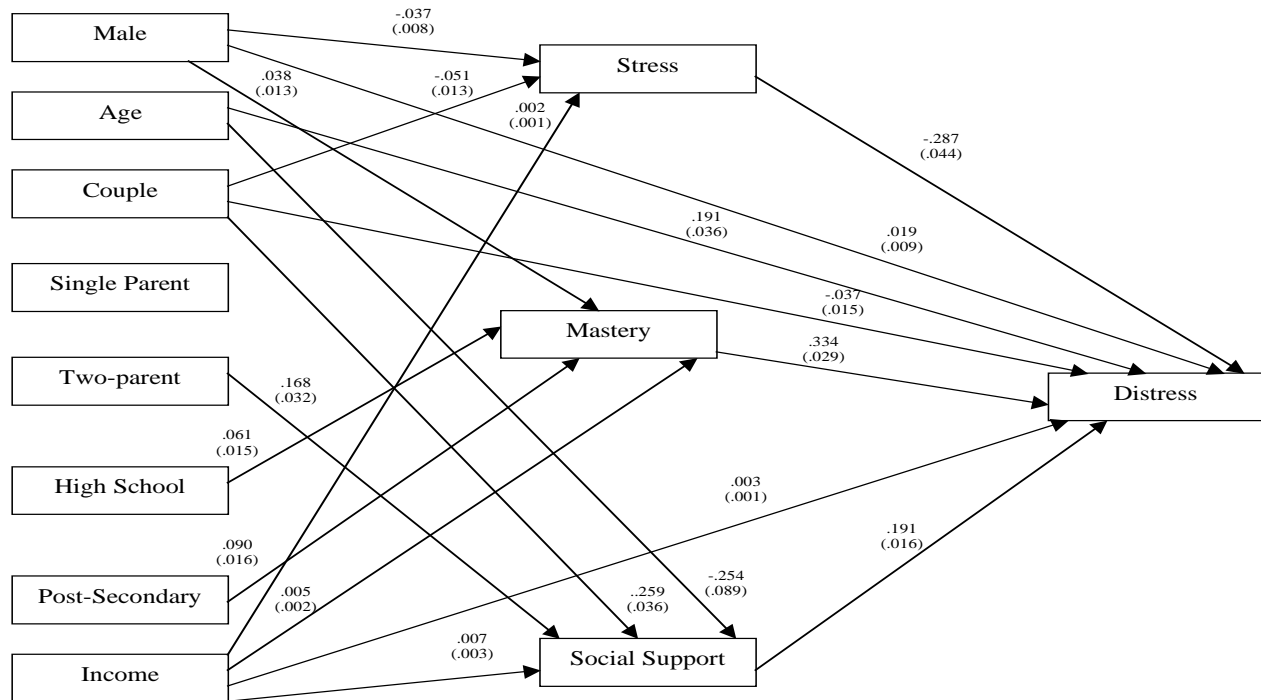
*Figure 5.* Statistically significant unstandardized coefficients for direct paths between social status, mediating variables, and well-being based on imputed model.

Among the mediating variables, the expected relationships were found. Stress was negatively related to well-being while mastery and social support were positively related.

Table 5 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 5

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

| | Unimputed | | | | Imputed | | | |
|---|---|---|---|---|---|---|---|---|
| | Stress | Mastery | Social support | Total[a] indirect effect | Stress | Mastery | Social support | Total[a] indirect effect |
| Male | 0.0027*** | 0.0014 | -0.0008 | 0.003 | 0.0106*** | 0.0127** | -0.0021 | 0.021** |
| | (0.0004) | (0.0014) | (0.0008) | (0.002) | (0.0028) | (0.0045) | (0.0042) | (0.008) |
| Female | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* |
| Age | 0.0316 | 0.0901 | -0.0757 | 0.046 | -0.0034 | 0.0144 | -0.0485** | -0.037 |
| | (0.0483) | (0.0807) | (0.0775) | (0.146) | (0.0095) | (0.0171) | (0.0175) | (0.031) |
| Single | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* |
| Couple | 0.0041** | 0.0014 | 0.0101*** | 0.014** | 0.0146*** | 0.0033 | 0.0495*** | 0.067** |
| | (0.0015) | (0.0014) | (0.0018) | (0.003) | (0.0044) | (0.0070) | (0.0080) | (0.014) |
| Single parent | 0.0000 | 0.0000 | 0.0000 | -0.001 | -0.0026 | 0.0037 | -0.0025 | -0.001 |
| | (0.0014) | (0.0014) | (0.0016 | (0.003) | (0.0046) | (0.0084) | (0.0084) | (0.015) |
| Two- parent | 0.0014 | 0.0000 | 0.0070*** | 0.009** | 0.0052 | 0.0020 | 0.0321*** | 0.039** |
| | (0.0014) | (0.0014) | (0.0017) | (0.003) | (0.0035) | (0.0060) | (0.0067) | (0.012) |
| < High school | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* | *Ref.* |
| High school | 0.0000 | 0.0028* | -0.0008 | 0.003 | -0.0011 | 0.0204*** | -0.0006 | 0.019 |
| | (0.0014) | (0.0014) | (0.0008) | (0.002) | (0.0029) | (0.0053) | (0.0052) | (0.009) |
| Post-secondary | -0.0014*** | 0.0042** | 0.0016* | 0.006** | -0.0517*** | 0.0301*** | 0.0082 | 0.033** |
| | (0.0002) | (0.0015) | (0.0008) | (0.002) | (0.0084) | (0.0059) | (0.0052) | (0.010) |
| Income | -0.0302 | 0.0634* | 0.0562* | 0.090 | -0.0006 | 0.0017* | 0.0013* | 0.002 |
| | (0.0171) | (0.0288) | (0.0270) | (0.052) | (0.0003) | (0.0007) | (0.0006) | (0.001) |

*Note.* Unstandardized regression coefficients with standard errors in parentheses. Coefficients calculated as *ab* = *a* x *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 $SEab = SQRT(b^2 SE^2_a + a^2 SE^2_b)$ where $SE_a$ and $SE_b$ are the standard errors for paths *a* and *b* respectively.
[a] 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 (ß = 0.312), followed by mastery (ß = -0.260), and social support (ß = -0.236). In the well-being model, social support (ß = 0.371) and mastery (ß = 0.366) had higher relative importance than stress (ß = -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 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.

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).  Connecting traditional culture may be an important resource that buffers against stress.

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, 2002). 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.

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