

Running head: SEEDS OF CHANGE

Planting the Seeds of Change: Evaluation of the Impacts of Community Gardens on
Well-being and Connections to Community and Nature in First Nations' Youth.

Graham Trull

Master of Arts Thesis

Lakehead University

Submitted in partial fulfillment of the degree of

Master of Arts in Clinical Psychology

Supervisor: Dr. Mirella Stroink

Second Reader: Dr. Rupert Klein



Library and
Archives Canada

Published Heritage
Branch

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque et
Archives Canada

Direction du
Patrimoine de l'édition

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence
ISBN: 978-0-494-43409-3
Our file Notre référence
ISBN: 978-0-494-43409-3

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.


Canada

Abstract

Aboriginal populations in Canada currently struggle with a variety of social, economic, and health issues. Many of these problems have been shown to relate to levels of connectedness to community and to nature, as well as involvement in cultural traditions. The current research measures these factors among youth both before and after the implementation of a community gardening project in an Aboriginal community in Northwestern Ontario. Paper and pencil questionnaires were used to measure well-being, sense of community, connectedness to nature, and cultural identification among youth in both the participating community and control communities. Significant relationships were found between well-being and Aboriginal identity, traditional food consumption and physical exercise. Aboriginal identity also had significant relationships to sense of community and connectedness to nature. Significant improvements in these measures were not observed over the course of the project.

Acknowledgements

I would like to thank my supervisor, Dr. Mirella Stroink, for her guidance and mentoring through the entire process. I also want to thank the colleagues who I worked alongside during the project, as well as my second reader, Dr. Rupert Klein, for his input in the preparation of both the proposal and final thesis. Special thanks go out to the members of the Food Security Research Network, who made this project possible, and the community leaders and participants from the First Nations of Ginoogaming, Long Lake 58, Aroland and Lake Helen for their support and assistance. I would also like to thank my family for all of their love and encouragement.

Table of Contents

	Page
Abstract.....	i
Acknowledgements.....	ii
Table of Contents.....	iii
Introduction.....	1
Aboriginal Health.....	2
Bicultural Identity.....	3
Well-being and Connectedness to Nature.....	8
Sense of Community.....	13
Community Gardens.....	16
Current Research.....	19
Hypotheses.....	24
Method.....	25
Participating Communities.....	25
Participants.....	26
Materials.....	27
Procedure.....	29
Results.....	30
Discussion.....	38
Time 1 vs. Time 2 Data.....	38
Time 1 Variable Analyses.....	43
Well-being.....	43

Aboriginal identity.....	48
Connectedness to Nature.....	50
Summary and Conclusions.....	50
References.....	54
Appendix 1: Coverletter.....	68
Appendix 2: Parent Coverletter.....	69
Appendix 3: Consent Form.....	70
Appendix 4: Questionnaire.....	71
Appendix 5: Second Round Demographics.....	83
Appendix 6: Debriefing Form.....	84

Planting the Seeds of Change: Evaluation of the Impacts of Community Gardens on Well-being and Connections to Community and Nature in First Nations' Youth

Aboriginal peoples in Canada currently struggle with a unique set of social and environmental challenges, which threaten health, well-being, and cultural tradition. Among the most concerning issues are high rates of poverty, suicide, substance abuse, and violence (Waldram, Herring & Young, 2006; Hawkins, Cummins & Marlatt, 2004). Many of these problems have been shown to relate to levels of connectedness to community and to nature, as well as involvement in cultural traditions (Waldram et al., 2006; Mayer & Frantz, 2004; Davidson & Cotter, 1991).

The current research explores the interaction of these factors in the context of a community enhancement project that took place in an Aboriginal community in North-Western Ontario. The project involved the creation of a large, shared agricultural garden, as well as several small garden boxes in one of three surveyed communities, with the other two communities acting as controls. Involvement of community members in the project was promoted across all age groups and levels of expertise through both a summer work program, as well as individual homes being involved in the maintenance and harvesting of their own gardens. Similar projects have been shown to have many positive benefits (eg. Armstrong, 2000b). Our research team included members of the Food Security Research Network, as well as students and faculty from the departments of psychology, forestry, and public health. We were interested in delineating how and why such projects impact personal well-being, with a particular focus on connectedness to nature, to community and to culture. Both qualitative and quantitative data were collected over the course of the project, with the focus of the current paper being on the

quantitative results. Data were collected both before and after the building of the gardens, in order to investigate changes that may have occurred due to the institution of the project.

Aboriginal Health

Over the past century, many changes have occurred in the circumstances and quality of life experienced by Native-Canadian communities, particularly in Northern or isolated areas. After failed attempts at assimilation, as well as struggles with viral epidemics such as tuberculosis, many communities faltered and were left in deplorable conditions. Although governments have taken some steps to repair past indiscretions, a large number of communities are still struggling to stay afloat, battling poverty, crime and health issues (Waldram et al., 2006).

Numerous health issues are prevalent in Aboriginal communities at a much greater rate than Canada as a whole. These problems are intensified in Northern and isolated communities, where health services are not as readily available. Issues of particular concern among these populations include infant mortality, diabetes, heart disease, obesity, substance abuse and suicide. Some improvements have been made in terms of health care delivery to these areas, but prevalence statistics generally remain above national averages (Waldram et al., 2006).

Particular problems among these populations, such as obesity and diabetes, may be a result of poor diet and nutrition. Type 2, insulin-dependant diabetes has been shown to occur among Aboriginal populations at much higher rates than the national average. As well, the rates among these groups showed increases throughout the 1990's (Waldram et al., 2006). Diabetes is a dangerous condition, as it is associated with complications

affecting the heart, circulation, the eyes, kidneys and nerves (Macaulay, Montour & Adelson, 1988). High rates of obesity, a serious risk factor for diabetes, have also been noted in these populations. Aboriginal groups show significantly more cases of obesity across all age groups, as measured by BMI (NAHO, 2004; As cited in Waldram et al., 2006). These conditions have been shown to impact one's sense of well-being and self-appraisal (Carr & Friedman, 2005; Klaczynski, Goold & Mudry, 2004). As well, they have been linked to lack of exercise and other activities that may help create resiliency against low self-esteem and depression (Labbé, Welsh & Delaney, 1988). The current research focuses on these and other mental health issues.

Mental health is considered to be very important in Aboriginal communities, particularly with the high reports of suicide and substance abuse among these populations. Suicide has long been a problem, some groups having suicide rates up to 800 times the national average (Chandler & Lalonde, 1998). The rates within these groups are among the highest of any culturally identifiable population in the world (Kirmayer, 1994). However, it has been shown that violence and suicide can be reduced through activities which establish and enhance community self-esteem through positive traditional values (Waldram et al., 2006).

Bicultural Identity

In addition to health issues, Aboriginal groups in Canada are affected by major social issues that have the potential to negatively impact their quality of life. These groups are often placed in culturally unique circumstances, whereby traditional Aboriginal activities and values are seen as directly conflicting with those of the North

American marketplace culture. This interaction between two or more cultures within the individual has been deemed “biculturalism”.

Several studies have shown that being competent in one’s own culture can have positive impacts among Aboriginals, including resilience against alcoholism and violence (Jilek & Roy, 1976; Lafromboise, Hoyt, Oliver & Whitbeck, 2006). According to Lafromboise, Coleman and Gerton (1993), in order to be culturally competent, one must:

(a) possess a strong personal identity, (b) have knowledge of and facility with the beliefs and values of the culture, (c) display sensitivity to the affective processes of the culture, (d) communicate clearly in the language of the given cultural group, (e) perform socially sanctioned behaviour, (f) maintain active social relationships within the cultural group, and (g) negotiate the institutional structures of that culture.

Gaining cultural competence can become particularly difficult when one is faced with conflicting messages from multiple cultural sources. These conflicting values and messages from opposing cultures can become a source of confusion and distress when an individual feels connected to both cultures simultaneously.

In a study by Mashek, Stuewig, Furukawa and Tagney (2006), prisoners were assessed on a number of different measures, and were asked to rate their level of connectedness to both the prison (criminal) culture and the culture of the community outside of the prison. They found that when individuals rated themselves as being strongly connected to both the criminal and the outside community (two groups with opposing values), they scored higher than those connected to either community alone on all measures of psychological distress and problematic behaviours, including depression, low self-esteem and drug problems (Mashek et al., 2006). This suggests that the inclusion of opposing cultural values in the individual could, in itself, create psychological distress and negative impacts on well-being. This could be compared to

cognitive dissonance, where the internalizing of opposing values and beliefs results in psychological distress (Mashek et al., 2006; Festinger, 1957). However, cultures can be understood as not opposing one another, resulting in less dissonance and distress.

Multiple cultures with differing beliefs and values can be understood by the individual in both oppositional and non-oppositional manners. Reconciliation of the cultures tends to follow specific models, as proposed by Lafromboise and colleagues (1993). The first such model is referred to as assimilation, and consists of the individual, who is part of a minority culture, having to adopt the beliefs and values of the dominant culture. While becoming a part of this dominant culture, the individual loses his or her original cultural identity.

A second model of second-culture acquisition is known as acculturation. In this process, the individual once again adopts the dominant culture; however, they do so as a result of necessity. Along with the process being involuntary in nature, it differs from assimilation in that the minority individuals will always be identified as part of the minority culture, regardless of their competence within the majority culture (Lafromboise et al., 1993).

The alternation model of second-culture acquisition suggests that an individual can both know and understand two different cultures. The individual, in this case, is able to adjust behaviour and attitudes in order to fit the context of the differing cultures. They can acquire competence in both cultures, without having to assign one of the cultures to a secondary status. This model also suggests that individuals that achieve this alternation strategy will be subject to less stress and anxiety than those applying other strategies (Lafromboise et al., 1993).

Next, the multicultural model posits the individual's ability to have a positive identity within their own culture, while also forming a positive identity with other cultures and the culture at large through involvement in shared institutions. In this way, the individual is connected to the dominant culture, while maintaining their own cultural values and connections. This differs from the alternation model in that the individual does not feel pressure to adjust attitudes and behaviours depending on the cultural context. Instead, they see all cultures as existing together and forming an overall culture through their combination (Lafromboise et al., 1993).

The final model of bicultural interaction is the fusion model, which is comparable to the idea of a cultural "melting pot". In this instance, it is suggested that cultures which share the same area and political or economic affiliations will eventually fuse together, becoming indistinguishable from one another, and forming a new culture. This is different from assimilation or acculturation in that there is no assumption of one culture's superiority over another. Instead, all cultures bring strengths and weaknesses into the formation of the new culture (Lafromboise et al., 1993).

These models display the complexities involved when trying to balance the influence from two or more cultures simultaneously. Confusion and resistance surrounding cultural influences can lead to increased anxiety and adjustment difficulties (Kazaleh, 1986). Therefore, bicultural competence can act as a protective factor against stress and anxiety caused by this cultural discrepancy. If the individual uses a positive strategy such as the alternation model, then they can create ideal circumstances within both cultures.

In the current study, youth participating in the gardening project will be gaining positive experiences which may have an impact on their bicultural competence. The project will involve a high degree of interaction with individuals within their Aboriginal culture, with the promotion of cultural values and knowledge occurring through experience with the production of natural subsistence foods. This could increase competence in their Aboriginal culture, a quality that has been shown to have positive psychological impacts (Lafromboise et al., 2006).

The current study includes a measure of cultural identification for both Canadian and Aboriginal cultures. This measure is known as the Three Factor Model of Social Identity, and is based on Social Identity Theory (Tajfel and Turner, 1979). These researchers identified 3 factors as being important to an individual's social identity:

- 1) Centrality (i.e., how central the identified group is to the individual's self-concept);
- 2) Ingroup Ties (i.e., connection to other members of the group); and
- 3) Ingroup Affect (i.e., how much the individual enjoys being a part of the group).

The instrument used to measure these factors in the current study is Cameron's three-factor model of social identity (Cameron, 2004). The scale is used twice for our study, asking the participants to rate their connection to both Aboriginal and Canadian cultures. Due to the involvement in traditional activities during the project, we expect to see the Aboriginal Identity of the youths to increase after participation. Canadian cultural identification will most likely remain consistent over the span of the project. The Canadian measure will not be evaluated for the purpose of this study, but may be analyzed at a later date.

Due to the positive connection between culture and well-being, it can be anticipated that an increase in Aboriginal identity would have a positive impact on the

well-being of participants (Waldrum et al., 2006). Those experiencing increases in identification could be expected to also show increased well-being in comparison with those whose identification remained the same.

Aboriginal identity was also evaluated in terms of other measured variables and their ability to explain unique variance within the measure. First, because the communities that are participating in the study are exclusively Aboriginal, it was expected that the sense of community would explain a significant amount of unique variance in Aboriginal identity. As well, the Aboriginal identity measure includes both ingroup ties and ingroup affect, concepts that should be highly related to sense of community. Therefore, we expected to find sense of community to explain a portion of variance in Aboriginal identity.

In addition, it was expected that our measure of connectedness to nature would explain unique variance in Aboriginal identity. Connection to land and to nature is a key aspect of Aboriginal culture and tradition (Rumbo, 2004; Zapf, 2005). It was therefore expected that those who expressed a stronger connection to nature would also convey a stronger Aboriginal identity. Those who have built a relationship with the natural world and attempt to experience more within nature should also have a strengthened sense of Aboriginal culture.

Well-Being and Connectedness to Nature

Research on human connection to the natural environment has indicated that persons endorsing stronger connections and more environmental behaviours tend to also rate higher on subjective measures of well-being (Mayer & Frantz, 2004; Villacorta, Koestner & Lekes, 2003). It has been hypothesized that feeling in connection to nature

has greatly decreased for humans since the beginning of the industrial age. This is most likely because we have been spending more time indoors, and less time interacting with our natural surroundings (Mayer & Frantz, 2004). In fact, it has been estimated that the average human spends 90% of their life within buildings (Evans and McCoy, 1998).

The trend toward spending more time indoors may be having a negative affect on the psychological well-being of humans. Research has shown that contact with nature can have a restorative impact on individuals, working to reduce stress and ease tension (Van den Berg, Hartig & Staats, 2007). For example, measures of affect and blood pressure have been compared after a stressful task, followed by either a walk in nature or a walk in an urban environment. In nature, blood pressure declined quickly, positive affect increased, and anger decreased. The opposite pattern occurred in the urban environment (Hartig et al., 2003). Other studies have shown health benefits simply from having a hospital room that has a window with a view of nature versus no window or a view of a brick wall (Ulrich, 1984; Hartig et al., 2003).

It is believed that natural environments contain qualities that assist in restoration and may not be present in other environments (Van den Berg et al., 2007). Firstly, being in a natural surrounding can give an individual the sense of being away from daily routines that require focused attention. Second, these environments contain many esthetically pleasing stimuli that encourage the use of one's senses, and capture one's attention. This is referred to as "soft fascination". Finally, natural surroundings tend to give a high degree of compatibility – that is, nature generally allows for the experience that the individual wishes to have within it. In other words, the natural world is fairly consistent and predictable, allowing people to plan their own experiences with some

assurance that they can become reality (Van den Berg et al., 2007). These qualities of natural environments allow for reflection and freedom from the constraints imposed by urban areas. This ability to restore was expected to influence participants in the current project, reducing stress levels, and lowering mental fatigue.

In addition to aiding in restoration, it can be hypothesized that spending more time outdoors will strengthen one's feeling of connectedness to the natural world (Mayer & Frantz, 2004). The current project involved the participants working in cultivated and woodland gardens, interacting directly with plant life in outdoor settings. This may have represented a significant increase in time spent outdoors and interaction with nature for a number of participants. Consequently, we expected to see an increase in participants' feelings of being connected to the natural world.

Due to the strong relationship between well-being and connection to nature (Mayer & Frantz, 2004), it can also be anticipated that involvement in the project will increase feelings of well-being. Research in social work has shown interventions combining therapy with wilderness and outdoor experience to be highly successful in promoting well-being and other positive outcomes (See Ungar, Dumond & McDonald, 2005 for a review). However, the majority of programs utilizing outdoor experience fail to produce empirical findings that might explain the driving aspects of successful outcomes, therefore justifying their continuation (Ungar et al., 2005). We intended to explore the effect that our project had upon well-being, as well as its relation to several other variables, such as connectedness to nature. In analyzing these variables, we hoped to clarify the relationship between an outdoor experiential program and its eventual impacts on well-being. We investigated whether secondary factors, such as

connectedness to nature and sense of community, might help explain participant outcome in terms of well-being.

Ungar and colleagues (2005) suggest that the relationship between natural experience and positive outcomes can best be explained in terms of risk and resilience. Risk can be understood as a variety of factors, including individual behaviours, which predict poor health outcomes, both mental and physical (Romer, 2003). These risk factors can range from biological to sociocultural and demographic conditions (Kirby & Fraser, 1997). The Canadian Aboriginal youth population can be understood as a population at risk, when considering their unique set of health and behavioural challenges discussed previously. Outdoor experiential programs, such as the current project, claim to mitigate these risk factors. Although the goals of such programs tend to align with risk mitigation, research has yet to confirm and explain the relationship between program participation and risk (Ungar et al., 2005).

Resilience is viewed as protection against risk that may be the result of an individual constellation of characteristics and capacities (Fraser & Galinsky, 1997). Specifically, resilience has been defined as “good outcomes in spite of serious threats to adaptation and development” (Masten, 2001, p. 228). Childhood resilience is understood to result from characteristics and capacities present in the child’s life, as well as interpersonal factors that control the impact of biological, mental, and social factors threatening a child’s health (Kaplan, 1999). Rutter, Giller and Hagell (1998) outline eight mechanisms that help to promote resiliency: 1) Reducing sensitivity to risk, usually occurring through successful coping experiences; 2) Reducing the potential for risk factors to impact on a child; 3) Reducing negative chain reactions; 4) Increasing positive

chain reactions; 5) Promoting self-esteem and self-efficacy through successful coping; 6) Neutralizing risks that a child is facing; 7) Giving positive opportunities for change and growth; 8) Encouraging positive processing, replacing helplessness with hopefulness.

These mechanisms tend to be present in outdoor programming, particularly those dedicated to the rehabilitation of troubled youth. The outcomes from these programs tend to resemble those of other intervention strategies, suggesting their viability in assisting at-risk populations (Ungar et al., 2005).

The current project fits under the rubric of environmental education programming, in that it should work to sensitize participants to nature, and help them recognize human interdependency with the natural world (Ungar et al., 2005). Programs in this category use close engagement with the natural environment in order to teach this interdependency. As well, our project fits in the category of outdoor wilderness program, meaning that it has the goal of promoting personal growth and recreation, using the natural environment as the context. Research in resilience has associated both program types with positive outcomes in individuals and groups. These outcomes have included enhanced self-esteem, self-efficacy, coping and competence, as well as decreased delinquency, suicidality and violence (Boss, 1999; Ewert, McCormick & Voight, 2001; Hirsch, 1999; Neill & Heubeck, 1998; Russell, 2000). Others have noted increases in energy flow, understanding of life cycles, appreciation of bio-diversity, tolerance for change and adaptability as common outcomes for outdoor programs (Bunting & Townley, 1999).

The positive outcomes that are associated with these other outdoor programs can be expected to occur within the current project. Although traditional outdoor programs

may have some differing focuses from our garden project, many of the same aspects and experiences are present. The positive outcomes such as increased resiliency and self-esteem noted in other studies are expected to be captured by the conceptualization and measurement of well-being in our study. Well-being was expected to increase over the course of the project, based on the aforementioned research on outdoor programs. In addition, literature specific to community garden projects has demonstrated this type of program to result in positive outcomes, as well as health and wellness benefits not seen in some other outdoor programs. This literature will be evaluated following a discussion on sense of community; which is also expected to be influenced by the project. Community gardening will be reviewed in terms of specific outcomes that separate gardening projects from outdoor programming in general.

Research provided support for the hypothesis that involvement in the current project would increase the sense of connectedness that participants felt with nature. In addition, we expected that connectedness to nature would act as a partial mediator when explaining the relationship between involvement in the project and changes in subjective well-being. Finally, the outdoor programming literature led to the prediction that subjective well-being would increase over the course of participation, as this should be highly associated with other positive outcomes noted in past studies.

Sense of Community

Sense of community (SOC) is generally accepted as impacting a variety of social issues. Research in this area can be traced back to Sarason (1974), who defined SOC as “the sense that one was part of a readily supportive network of relationships upon which one could depend” (p. 1). This sense of community can be present in a variety of

contexts, from neighborhoods (Farrell, Aubry & Coulombe, 2004) to online chat rooms (Herrero, Meneses, Valiente & Rodriguez, 2004).

More recent work in this field of study uses the conception of SOC proposed by McMillan and Chavis (1986). These researchers saw SOC as “a feeling that members have of belonging and being important to each other, and a shared faith that members’ needs will be met by the commitment to be together” (McMillan & Chavis, 1986, p. 9). They explained that sense of community includes feeling emotional safeness, as well as a sense of membership and identification. Within this context, members have influence over the community, while also adhering to its expectations. Sharing emotional connections with other community members promotes the belief that the individual will be taken care of by the community (McMillan & Chavis, 1986). Our study will use the Sense of Community Index (SCI; Perkins, Florin, Rich, Wandersman & Chavis, 1990) to measure SOC, a scale that is designed to fit with the theory of McMillan and Chavis (1986).

Several studies have researched the possible impact of sense of community on psychological characteristics in adults, such as well-being, loneliness and resiliency (Davidson & Cotter, 1991; Roussi, Rapti & Kiosseoglou, 2006). These studies have found sense of community to have a positive relationship with measures seen as predicting good quality of life and positive outcomes.

A relatively small amount of research has been conducted assessing the role sense of community has in quality of life measures for adolescents. However, two studies have been conducted regarding the relationship of adolescent SOC to both loneliness and well-being (Pretty, Conroy, Dugay, Fowler & Williams, 1996; Pretty, Andrewes & Collett,

1994). Pretty and colleagues (1996) used a set of 234 adolescents aged 13 to 18, and had them complete measures of social support, loneliness, well-being, and sense of community. They found that sense of community was significantly related to affective aspects of well-being (participants rated high on SOC showed more happiness and less worry). They also found a positive relationship between SOC and assessment of an individual's coping efficacy. As well, sense of community showed a significant negative relationship with loneliness among the adolescents, such that loneliness tended to increase as sense of community weakened (Pretty et al., 1996). These results clearly demonstrate a positive association between sense of community and well-being. SOC may be working to both improve well-being and coping ability, while protecting against negative traits such as loneliness. The current project hopes to extend the research on adolescent sense of community, while delineating its role in project outcomes, such as well-being.

While it is generally assumed that experience can have an impact on an individual's sense of community, there has been little research on how and why this might be. Researchers have noted that SOC can be changed and strengthened due to a common external threat to the community. When the threat is no longer present, the SOC measure tends to return to normal (Loomis, Dockett & Brodsky, 2004). However, change in sense of community has yet to be measured when it is due to positive action within the community.

SOC was measured in the same individuals, both before and after involvement in the community gardening project. Because of the nature of the project, the participants had to work together in a community atmosphere, striving towards a common goal.

These individuals had to cooperate, be supportive of one another, and depend on each other in order for the gardens to be successful. These activities align well with the definitions of sense of community put forth by both Sarason (1974) and McMillan and Chavis (1986). Therefore, we expected that measures in sense of community would increase after participant involvement in the project. We anticipated that those participating most in the project would experience the greatest increases in sense of community.

Community Gardens

The concept of community gardens has existed for decades. Their use has been promoted as a way to improve psychological well-being and social relations, to increase availability of fresh foods, and to aid in healing. These gardens gained particular importance during both World Wars and during the Great Depression, when supplies of fresh food were scarce (Armstrong, 2000a).

In addition to increased availability of fresh, healthy foods, studies have shown community gardens to result in a variety of benefits for both individuals and communities. One set of researchers found that participants in a community garden had greater consumption of fresh vegetables and lower consumption of sweet food and drinks versus non-gardeners (Blair, Giesecke & Sherman, 1991). This result, however, may be explained by healthy eaters being more likely to participate in gardening. Other studies give evidence that being involved in community gardening benefits the psychological well-being of participants (McBey, 1985; Francis, Lindsey & Rice, 1994). Gardeners and community residents have also shown improvements in terms of social well-being (McBey, 1985; Sommer, Learey, Summitt & Tirrell, 1994). This change may result from

the garden taking on the role of a community gathering place, meeting area, and forum for events. These gardens have taken place across contexts, both in high and low-socioeconomic neighborhoods (Armstrong, 2000a).

As functioning, agricultural gardens, these projects can help residents and participants save on the cost of food. One set of researchers estimated savings between \$50 and \$250 per season for gardeners involved in the project (Hlubik, Hamm, Winokur & Baron, 1991). Savings on household expenses are an important benefit of the gardens, particularly when they are built as enhancement projects in low socioeconomic communities.

Research has also focused on the beneficial impacts on health that stem from garden work. In particular, gardening as a form of exercise has been evidenced as positively affecting health (Blair et al, 1991; Hlubik et al., 1994). Gardening is ranked as moderate to heavy intensity physical activity (Ford et al., 1991) and has been shown to lower cholesterol and blood pressure (Crespo, Keteyian, Heath & Sempos, 1996). It is commonly ranked as one of the most popular forms of physical activity (Crespo et al., 1996). These studies give evidence that the initiation of gardening projects should help to increase valuable forms of physical activity, increasing healthy lifestyle habits, and improving physical health. Other studies focus on the nutritional and environmental impacts of gardening. Libman (2007) found that children involved in a gardening project showed improved food consciousness and eating habits. Another study, which teamed elderly farmers and schoolchildren in gardening, found that children became more environmentally conscious, and improved their understanding of the interconnectedness of nature (Mayer-Smith, Bartosh & Peterat, 2007). The majority of these studies took

place in urban centres, where the natural setting of a garden may represent a break from a more constructed landscape.

Research on community gardens has also demonstrated their effectiveness in impacting major health concerns, such as diabetes. Recommendations for the care and prevention of diabetes include maintaining a healthy weight, regular physical exercise, and eating a proper diet including fresh fruits and vegetables (Armstrong, 2000b). Community gardens promote all of these behaviours, through increased physical activity and availability of fresh produce. In fact, in a study by Armstrong (2000b), a garden initiative in a First Nations community in the United States resulted in increases in medical exams surrounding diabetes, and a greater percentage of individuals with diabetes having lower, stable blood glucose levels. As well, across the community, results showed a lowered prevalence of obesity, overweight and depression, as well as increases in physical activity and consumption of vegetables and fruits (Armstrong, 2000b). Outcomes such as this suggest that facets of health not being measured in the study may also show significant improvement.

When treating an illness like diabetes among Aboriginal populations, cultural values encourage treatment of the whole person; physical, mental and spiritual (MacCaulay et al., 1997). Gardening and agriculture are examples of traditional food sources for Aboriginal people. Research has shown not only the nutritional value of these traditional foods, but also the connection to Aboriginal identity and culture (Tait, 2006; Dombrowski, 2007). These so-called “subsistence” forms of food are given deep, symbolic meaning among many in these cultures (Dombrowski, 2007). This suggests that those consuming more traditional foods may experience a stronger sense of

Aboriginal identity. As well, many studies have shown that improved nutrition can positively impact mental health and well-being (Cook & Benton, 1993; Logan, 2006). Therefore, the nutritional value and cultural importance of traditional foods may lead to an improved well-being for those eating them.

In terms of treating the whole person for a disease such as diabetes, depression may be an important factor, having a negative impact on exercise, nutrition, and weight-management, all of which help to prevent the illness (Fisher et al., 1991; Carter, Pugh & Monterrosa, 1996). In a sample of one Native American community, 44% of community members endorsed some symptoms of depression (Armstrong, 2000b). These mental and spiritual aspects of health are important to consider, and may also be improved by community gardening. Positive impacts on personal and social well-being imply that depressive symptoms could be alleviated through participation in the gardens.

Several studies have emphasized the effectiveness and power of community gardens for the promotion of health, well-being, and sense of community (eg. Armstrong, 2000a; Glover, 2003). Many of these projects have been implemented in economically and socially disadvantaged communities. The gardens in these communities show additional benefits of improved community mobilization, leading to action on other community problems (Armstrong, 2000a). The community in the current study fits in this disadvantaged category, and could benefit from this type of mobilization.

Current Research

Our research team worked together with the First Nations community of Ginoogaming in the development of community-based cultivated gardens over the spring and summer of 2007. Community members from Ginoogaming and Long Lake #58 in

Northwestern Ontario were involved in the planting, organization and maintenance of gardens. Leaders from Ginoogaming joined up with a team of researchers at Lakehead University, and acquired the funding for equipment and youth employment in the gardens. Lakehead faculty and students from 3 different fields of study were involved in consultation and support for the project, working with the communities to conduct research related to the effects of the gardens.

The project included involvement of persons across almost all age groups, sharing responsibilities and experiences across participants. The youngest participants were those in preschool and elementary school, who were somewhat involved with the garden through learning and leisure experiences. Adolescents were next major participants in the project. Twenty-nine youth were working as summer students, with tending to the large, community-based garden as part of their weekly duties, in addition to other maintenance and beautification projects in the community. These students were working either 2, 4 or 7 hours a day, 5 days a week, for 6 weeks in the summer. In addition, 5 older youth filled positions as Research Assistants, who organized and ran daily activities with the younger workers. They also assisted with community research through participant gathering and data entry. The young people filling these positions were provided with the opportunity to learn the skills of leadership, organization and group management. Finally, adults and older individuals filled a major role in the project. Several older community members worked in the gardens as “environmental workers,” assisting with the garden alongside the youth. Other elderly community members were encouraged to participate at their leisure.

Additionally, small “garden boxes” were made available to interested community members. These boxes were built in the yards of 12 community homes, and planted with vegetables chosen by those families. These gardens were tended by the homeowners, and promoted the involvement of those outside of the summer student program.

Our specific interest for the project was the measurement of well-being, sense of community, connectedness to nature, and cultural identity for individuals involved in either form of gardening, with a particular focus on youth. Well-being was measured by the PANAS (Watson, Clark & Tellegen, 1988), the Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985), and the State Self-Esteem measure (Heatherton & Polivy, 1992). Sense of community, connectedness to nature and Aboriginal identity were expected to account for a large amount of variance in the measures of well-being. Studies have suggested that sense of community can have a positive impact on well-being, through increased pride and social contact (Davidson & Cotter, 1991; Roussi et al., 2006). As discussed previously, connectedness to nature can impact well-being through increased resiliency and decreased stress (Mayer & Frantz, 2004; Villacorta et al., 2003; Van den Berg et al., 2007). Finally, Aboriginal identity, as previously mentioned, has been seen to positively impact well-being and decrease negative behaviours (Waldram et al., 2006). Therefore, these three measures were expected to explain variance in the measurements of well-being used in the current study.

Connectedness to community was measured using the Sense of Community Index (Perkins et al., 1990). Connection to nature was assessed with a measurement called the Connectedness to Nature Scale (CNS; Mayer & Frantz, 2004). Aboriginal identity was measured by the Three Factor Model of Social Identity (Cameron, 2004).

Additional measures were taken regarding food intake and physical exercise, both having relationships to the activity of gardening. First, we measured traditional food consumption through ten items from the Food Source Scale (developed for the current study), indicating natural or traditional sources of food. This scale was used to assess the practice of traditional hunting and gathering activities of participants. Relationships were examined between this scale and the measures of well-being, Aboriginal identity and connectedness to nature.

First, we anticipated well-being to have a significant, positive correlation to traditional food consumption, since these food sources tend to be healthier and more natural (Tait, 2006). Several studies and reports have shown that well-being and mental health tend to improve with better nutrition (Cook & Benton, 1993; Logan, 2006). Our study compared measures of well-being and traditional food in participants to discover whether this relationship is present among members of these First Nations communities.

Next, comparisons were made between traditional food consumption and Aboriginal identity. Some research points to traditional or subsistence food consumption as an important part of Aboriginal identity (Dombrowski, 2007; Tait, 2006). However, research is limited in terms of quantitative measurement of this relationship. We have compared these variables by correlation, in order to provide preliminary data in this regard. We expected a strong positive correlation between Aboriginal identity and traditional food consumption.

The relationship between traditional food consumption and connectedness to nature was also investigated in our data. This relationship has not been addressed in the literature, but makes inherent sense. Those who tend to consume more natural and

traditional food would more likely feel a connection with the natural world around them. As well, those feeling more in connection with nature may spend more time outdoors, and therefore be exposed to natural or traditional food sources more often. This connection was investigated through correlational data in order to provide a starting point for this line of research.

A simple self-report measure of physical exercise was also taken, asking participants, “How many times a week do you participate in physical exercise or recreation?”. This measure was used to investigate the relationship between physical activity and well-being among participants. As mentioned previously, research has shown strong connections between gardening as a physical activity and well-being (Blair et al, 1991; Hlubik et al., 1994). Other studies have shown that in general, those participating in more physical exercise of any kind tend to score higher in measures of mental health and well-being (See Penedo & Dahn, 2005 for a Review). Improvements in ratings of well-being, depression and anxiety following interventions involving physical exercise have also been observed (Penedo & Dahn, 2005). The gardening project did include moderate physical activity five days a week for participants. This may have been a significant increase for a number of participants. Although our focus is not on exercise as the mode of intervention in the project, we do wish to verify this relationship between physical activity and mental well-being. The association between a sedentary lifestyle and mental health may be important information for community members, and a possible direction for future research.

All measures were taken before the building of the gardens and after the conclusion of the work programs, to determine change over the course of the project.

This was to be compared to measures taken in the control communities of Aroland and Lake Helen, to account for seasonal changes.

Hypotheses

We expected to see improvements in all measures relating to sense of community, connectedness to nature and well-being. Both the focus on traditional values and the outdoor experiential components have been shown to increase well-being in community building exercises, as well as in treatment programs for youth at risk (Waldram et al., 2006; Russell, 2003). As well, the program itself was designed to enhance sense of community among participants and observers. The multi-generational approach to the project ensured that many community members, across different age-levels and abilities, worked together toward a common goal. It was expected that this project format would have a significant impact on the sense of togetherness and community felt among these individuals. We also expected that change in connectedness to community, connectedness to nature, and Aboriginal identity would each partially account for the effect of garden participation on well-being.

Specific hypotheses can be outlined as follows:

1. We expected that those in the Gardening communities would show significantly higher scores than those in control communities on all measures of well-being, plus CNS, SOC, and cultural identification at time 2, when controlling for initial scores at time 1.
2. Individuals in the gardening communities were expected to show a significant increase in each measure of well-being from time 1 to time 2. Increase within gardening communities would be greater in respondents indicating greater

involvement in the project. Change in well-being from time 1 to time 2 in gardening communities was also expected to be accounted for by changes in CNS, SOC, and Aboriginal identity

3. Significant relationships were expected among connectedness to nature, SOC, Aboriginal identity and well-being, as well as other measures. Specifically:
 - a. Aboriginal identity, CNS and SOC were each expected to account for significant amounts of unique variance in well-being.
 - b. CNS and SOC were each expected to account for significant amounts of unique variance in Aboriginal identity.
 - c. Significant positive correlations were expected to be seen between:
physical exercise and well-being; traditional food consumption and well-being; traditional food consumption and Aboriginal identity; and
traditional food consumption and CNS.

Method

Participating Communities

Ginoogaming First Nation was the location of the majority of research participants, and the gardening project itself. This community is located approximately 300 kilometers northeast of Thunder Bay, next to the town of Longlac, Ontario. The First Nation has approximately 800 band members, with an on-reserve population between 150 and 200.

Several participants also came from Long Lake #58 First Nation, which is located just west of Ginoogaming, adjacent to the town of Longlac. This community has approximately 1, 200 band members with an on-reserve population of approximately 400.

Aroland First Nation served as a control community, and is located approximately 350 km northeast of Thunder Bay, near the town of Nakina, Ontario. The community has approximately 700 band members, with an on-reserve population of approximately 300.

Lake Helen First Nation served as a second control community. It is located approximately 110 km northeast of Thunder Bay, just outside the town of Nipigon, Ontario. This community has approximately 1,400 band members, with approximately 300 living on the reserve.

Participants

Participants were 79 community members (31 males; 48 females) aged 13 to 53, who completed one or both rounds of the survey. It was not necessary that participants be involved in any gardening in order to fill out the surveys. The majority of participants came from Ginoogaming (63), with a relatively small number of controls coming from Aroland (4) and Lake Helen (12). A total of 66 participants (29 males; 37 females) completed the first round of the survey, with ages ranging from 13 to 53 (89.1 % between 13 and 30). In the second round, the project suffered from a fairly high attrition rate, and resulted in only 34 participants (10 males; 24 females), 13 of whom (2 males; 11 females) had not completed a survey in the first round of collection. Ages in the second round ranged from 13 to 53 (80 % between 13 and 30), with a majority (N = 22) having some involvement with either the large garden (N = 17) and/or the garden boxes (N = 18). This led to a total of 17 individuals who had completed the majority of sections in both rounds of the survey (5 males, 12 females). In the second round, control groups were difficult to contact directly, and we were able to collect only 4 control surveys.

Materials

The data were collected via paper-and-pencil questionnaires. First, participants received a cover letter explaining the project and the survey (Appendix 1). If the participant was under 18 years of age, a parent was asked to read a separate cover letter and to sign a consent form (Appendix 2 & 3) before the child completed the survey. The questionnaire package filled out by participants has been included as Appendix 4. First, a cover sheet explained consent and confidentiality to the participants, and asked them to fill out several questions about themselves, in order to come up with a unique identifier that was used to connect the first and second rounds of the survey. The next sheet asked for demographic information. Sex, age, languages, time spent outdoors, and knowledge of the project were all assessed. The second round demographics were very similar, with additional questions assessing various aspects of involvement with the project (Appendix 5).

Participants were asked to complete an adapted version of the Connectedness to Nature Scale, a 5-point scale measuring connection to the natural environment (CNS; Mayer & Frantz, 2004). This scale has been shown to have good psychometric properties, and correlates well with related scales (Mayer & Frantz, 2004). The original 14-item scale was shortened to 10 items. The Cronbach's alpha of the new scale was .88, implying good reliability. Next, the Sense of Community Index, a 12-item, 5-point scale was used to assess how much participants feel a part of their community. Other researchers found this scale to have good psychometric properties, and a Cronbach's alpha of .80 (SCI; Perkins et al., 1990). The scale was adapted through rewording in order to apply to the Aboriginal communities, and was shortened to 11 items due to

issues with reliability. The new version of the scale had a Cronbach's alpha of .64, showing moderately good reliability.

Well-being was measured by the Satisfaction with Life Scale, which consists of 5 items that ask participants to rate the conditions of their life on a 5-point scale (Diener, Emmons, Larsen & Griffin, 1985). The reliability of this scale was strong, with a Cronbach's alpha of .83. This is a commonly used measure of well-being, and has good psychometric properties (Diener et al., 1985). The PANAS then measured well-being according to a 5-point rating scale of the occurrence of 20 emotions: 10 positive and 10 negative (Watson, Clark & Tellegen, 1988). It is also quite commonly used, and performs well psychometrically (Watson et al., 1988). For the purpose of our study, negative items were reverse coded, in order to create a single, positive affect score. Reliability of this scale was fairly high, showing a Cronbach's alpha of .72. The State Self-Esteem measure also assessed well-being. This 10-item version of the scale was adapted using our own pilot data (N = 120) in order to be applied to all participants, whether or not they were currently attending school. The adapted scale had good reliability, with a Cronbach's alpha of .82. It uses a 5-point rating scale to assess how the individual feels about themselves at the time of the survey (Heatherton & Polivy, 1992). It also had high reliability in the current study, displaying a Cronbach's alpha of .75.

Next, participants filled out some original measures of traditional food consumption and physical exercise. Traditional food consumption was measured through ten items from the Food Source Scale, designed for this study to measure the usage of natural and traditional sources of food (eg. fishing, hunting, growing vegetables in a garden). The food sources are rated on a six point scale, recording the frequency that the

participant consumes foods from each source (See Appendix 4, p. 75, Questions 3-11, 13). Items from the scale that indicated non-traditional food sources were not analyzed. The scale was found to have good reliability among participants, with a Cronbach's alpha of .86. Physical exercise was recorded by a single-item measure asking participants the number of times per week that they engage in physical activity. This was rated on a four-point scale, ranging from zero to five or more (See Appendix 4, p. 73, Section 2, Question 3).

Finally, Aboriginal identity was assessed using the Three Factor Model of Social Identity (Cameron, 2004). This 12-item scale uses a 5-point rating system, asking the same questions as they relate to the participant's understanding of Aboriginal and Canadian cultures (see Appendix 4, page 77). Only Aboriginal identity was investigated in the present study. This scale has good psychometric properties, and measures 3 subscales of centrality, ingroup ties, and ingroup affect (Cameron, 2004). Reliability was high, showing a Cronbach's alpha of .76.

Procedure

The participants were asked to complete the questionnaires in each of two measurement periods, before and after building the gardens. These measurement times fell in late June and early September 2007, although some second round surveys were completed in early October. Completion of the questionnaire took less than 60 minutes for most participants and was done either with the investigator present or at a later time alone. After completing the questionnaire, the participants were verbally debriefed about the experiment and received a debriefing form (See Appendix 6). Any questions or

concerns that the participants had were asked to be directed to myself or other investigators at this time. However, no such concerns arose over the course of the study.

Upon completion of the questionnaire, participants were entered into a draw for cash prizes totaling \$600 (\$300 for each round of surveys). This prize draw was a way of rewarding those who participated in the study through the completion of surveys. The draws took place in August and early October respectively.

Results

The data from the subjects were analyzed with SPSS statistical software. Unfortunately, hypothesis 1, which was to be tested to determine whether the groups showed change in several measures between the first and second measurements, could not be tested. We had planned to use ANCOVAs with each time 2 measure of well-being as the dependent variable, group (control vs. gardening) as the independent variable, and the time 1 score as a covariate. The same test was going to be used for the variables of connectedness to nature, connectedness to community, and Aboriginal identity. However, problems in collecting the second round of control data resulted in our inability to run these tests. We alternatively considered data from those participating in the garden by itself, focusing on hypothesis 2.

The second hypothesis, that individuals in the gardening community were expected to show a significant increase in each measure of well-being from time 1 to time 2, was tested using a paired samples t-test comparing time one and time two scores for each measure of well-being, including only results from participants in the gardening community (N = 17). The majority of these participants (N = 12) were directly involved in gardening either through the large garden (N = 9) or the individual garden boxes (N=

3). Tests were also performed for the variables connectedness to nature, sense of community, and Aboriginal identity. For each of the variables, no significant increases were noted at time 2 (after the gardening period) relative to time 1 (before the gardening period). For two of the variables, significant decreases were noted at time 2. Aboriginal identity, $t(12) = 2.69, p < 0.05$, and well-being as measured by the PANAS, $t(16) = 2.46, p < 0.05$, decreased over the course of the project (Table 1). Due to the lack of improvement in well-being, analysis was not performed which would have investigated which variables contributed to this improvement.

Table 1

T-tests Comparing Time 1 and Time 2 Data

	Time 1 Mean	Time 2 Mean	<i>p</i>
PANAS	3.81	3.59	.03*
Life Satisfaction	3.47	3.31	.29
SES	3.88	3.71	.15
CNS	3.45	3.38	.50
SCI	3.37	3.30	.45
Aboriginal identity	3.93	3.67	.04*

* $p < .05$

Hypothesis 3, which stated that significant relationships were expected among connectedness to nature, SOC, Aboriginal identity and well-being, as well as other measures, was first tested by performing bivariate correlations for these variables among all participants involved in time 1 ($N = 66$). Other variables, such as health and demographic characteristics, were also included in that analysis. Several

Table 2

Bivariate Correlations between Major Variables

	PANAS	Satisfaction w Life	SSE	Aboriginal Identity	SCI	CNS	Traditional Food	Physical Exercise
PANAS	1	.38**	.28*	.44**	.31*	.12	.18	.03
Satisfaction w Life		1	.19	.23	.33**	.12	.36**	.26*
SSE			1	.04	-.16	-.11	.21	.04
Aboriginal Identity				1	.36**	.41**	.03	-.02
SCI					1	.35**	.07	.07
CNS						1	.30*	-.10
Traditional Food							1	.08
Physical Exercise								1

relationships were found between these variable sets (Table 2).

* $p < .05$

** $p < .01$

Hypothesis 3 was further tested by performing regression analyses for the specific hypotheses. For Hypothesis 3a, it was expected that CNS, SCI and Aboriginal identity would each uniquely predict well-being. This hypothesis was tested in three regressions; one for each separate measure of well-being. With PANAS as the dependent variable, the overall model was significant, $F(3, 49) = 4.13, p = .011$. Only Aboriginal identity significantly predicted PANAS (Table 3).

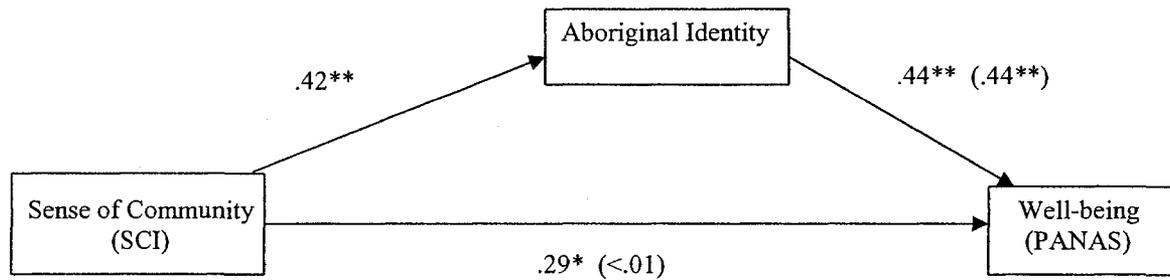
Table 3

Sequential Regression of Variables Relating to DV PANAS

	B	SE B	β
Step 1 ($R^2 = .06$)			
CNS	.16	.09	.25
Step 2 ($\Delta R^2 = .01$)			
CNS	.13	.09	.21
SCI	.09	.12	.12
Step 3 ($\Delta R^2 = .13$)			
CNS	.05	.09	.08
SCI	-.01	.12	-.02
Aboriginal Identity	.30	.11	.42**

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

After evaluation of these results, further analysis was undertaken in order to better understand these data. Since SCI was significantly correlated with the PANAS, but explained no unique variance, a mediational analysis including SCI, PANAS and Aboriginal identity was undertaken. It was found that Aboriginal identity fully mediated the relationship between SCI and PANAS. The standardized regression coefficient between sense of community and well-being decreased to non-significance when controlling for Aboriginal identity (Fig. 1). Other conditions of mediation were also met: Aboriginal identity was significantly related to both SCI and PANAS, and maintained a significant relationship to PANAS when controlling for SCI (Baron & Kenny, 1986). The variance in the measurement of PANAS explained by the SCI can therefore be attributed to the strong relationship between SCI and Aboriginal identity. SCI does not explain a significant amount of unique variance in PANAS when controlling for Aboriginal identity.



* $p < .05$, ** $p < .01$

Figure 1. Standardized regression coefficients for the relationship between sense of community and well-being as mediated by Aboriginal identity. The coefficients when controlling for the opposite variable (either SCI or Aboriginal identity) are in parentheses.

With CNS, SCI, and Aboriginal identity predicting the Satisfaction with Life Scale (SWLS), the overall regression model was not significant, $F(3, 49) = 1.37, p > .05$, and no significant relationships were found. Finally, with State Self-Esteem as the dependent variable, and CNS, SCI and Aboriginal identity as predictors, the overall model was not found to be significant, $F(3, 49) = 2.46, p = .074$. The analysis showed that SCI accounted for a significant amount of unique variance in State Self-Esteem, in a negative direction (Table 4).

Table 4

Sequential Regression of Variables Relating to DV SES

	B	SE B	β
Step 1 ($R^2 = .01$)			
CNS	-.13	.16	-.12
Step 2 ($\Delta R^2 = .08$)			
CNS	-.02	.16	-.02
SCI	-.42	.21	-.30*
Step 3 ($\Delta R^2 = .04$)			
CNS	-.09	.17	-.08
SCI	-.52	.21	-.37*
Aboriginal Identity	.28	.19	.23

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

Hypothesis 3b, that CNS and SOC are each expected to account for significant amounts of unique variance in Aboriginal identity, was tested in a regression analysis with Aboriginal identity as the dependent variable, and CNS and SCI as predictors. The overall model was significant, $F(2, 50) = 8.36, p = .001$. Both CNS and SCI explained a significant amount of unique variance in Aboriginal identity (Table 5).

Table 5

Sequential Regression of Variables Relating to DV Aboriginal identity

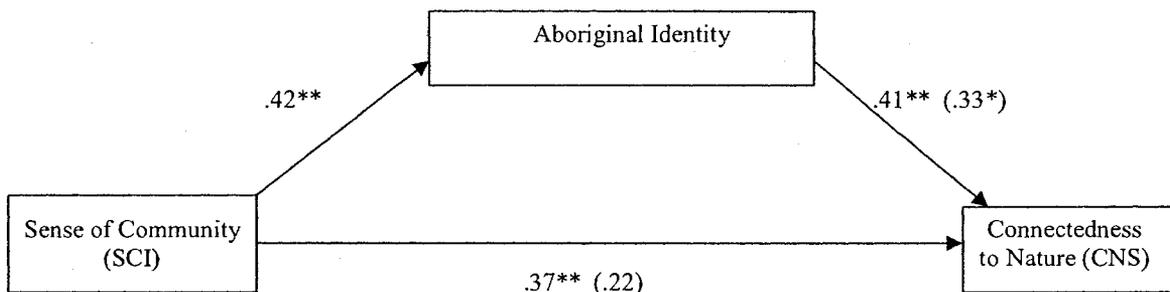
	B	SE B	β
Step 1 ($R^2 = .16$)			
CNS	.37	.12	.41**
Step 2 ($\Delta R^2 = .09$)			
CNS	.27	.12	.30*
SCI	.36	.15	.31*

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

Due to the strong relationships of both CNS and SCI to Aboriginal identity, as well as their strong relationship to one another, a mediational analysis was undertaken. Aboriginal identity mediated the relationship between Sense of Community (SCI) and

Connectedness to Nature (CNS). The standardized regression coefficient between SCI and CNS was reduced to non-significance when controlling for Aboriginal identity. It can also be observed that Aboriginal identity was significantly related to both SCI and CNS, and the relationship to CNS maintained significance when controlling for SCI (Fig. 2). This model meets the requirements for mediation as outlined by Baron and Kenny (1986).

The mediational model suggests that the significant relationship between SCI and CNS can better be explained in the strong relationship between SCI and Aboriginal identity. Rather than SCI being directly related to CNS, it is actually related to Aboriginal identity which, in turn, has a strong relationship to CNS. When the variance attributable to Aboriginal identity is removed, SCI does not explain a significant amount of unique variance in CNS.



* $p < .05$, ** $p < .01$

Figure 2. Standardized regression coefficients for the relationship between sense of community and connectedness to nature as mediated by Aboriginal identity. The coefficients when controlling for the opposite variable (either SCI or Aboriginal identity) are in parentheses.

Finally, hypothesis 3c, that significant correlations would be seen between:

Physical Exercise and well-being; Traditional food consumption and well-being;

Traditional food consumption and Aboriginal identity; and Traditional food consumption and CNS, was tested using binary correlations (Table 1). A moderately positive correlation was noted between amount of physical exercise and satisfaction with life, $r = .26, p < .05$. Persons engaging in more physical exercise also tended to report higher levels of satisfaction with life. However, this same relationship was not observed for either the PANAS, $r = .03, ns$, or the State Self-Esteem scale, $r = .04, ns$. Therefore, physical exercise may only relate to certain aspects of well-being.

A significant positive correlation was found between consumption of traditional food, and satisfaction with life, $r = .36, p < .01$. Those who consumed more food from traditional sources also tended to rate higher in life satisfaction. However, significant relationships were not observed between traditional foods and either the PANAS, $r = .18, ns$, or the State Self-Esteem scale, $r = .21, ns$. Thus, consumption of traditional foods only relates to some aspects of well-being for members of these communities.

No significant relationship existed between traditional food consumption and Aboriginal identity, $r = .03, ns$. The use of traditional food sources did not change with participant endorsement of Aboriginal identity.

A significant positive correlation was found between traditional food consumption and connectedness with nature, $r = .30, p < .05$. Therefore, persons claiming to consume more traditional foods also tended to convey a strong personal connection to nature.

Discussion

Time 1 vs. Time 2 Data

Our results failed to show that the gardening project in Ginoogaming had any significant positive impact on participants. In fact, at measurement Time 2, two measures showed significant decreases (well-being and Aboriginal identity). However, it is important to understand these results in the context of the community and events that were occurring outside of the garden project. During the period of Time 2 data collection, there were several negative occurrences in the community. Three abandoned houses in the community were set on fire in separate incidents, causing a great deal of concern among community members. Two of the houses were close to houses with current residents, creating fear that the fires would spread. At this time, community members were expressing distress over the events and worries about the state of their community. Following the first fire-setting incident, several youths in the community were arrested. Community members were discussing these arrests, and were unsure what was going to happen with these youths. A full qualitative record of these events and other occurrences is available through the work of a colleague (Ray, 2008).

The negative events could very likely explain the decreases in well-being (PANAS) and Aboriginal identity at Time 2. Experiencing these events and the distress they caused to others could easily have elicited negative emotions from participants. Since the PANAS measures the occurrence of positive and negative emotions, it is quite plausible that the measurement was affected at time 2, which took place shortly after these events. Although the PANAS is a long-term measure of well-being, asking participants how much they experience emotions “on average”, their memories and

perceptions could easily have been influenced by recent negative events. It is likely that community members were experiencing frustration with their community and culture at the time of this second measurement. This could have impacted the measure of Aboriginal identity, as it asks participants to rate feelings of pride and engagement in Aboriginal culture.

In addition, it is possible that these happenings cancelled out any positive effect that might have been observed in the data. However, upon spending time in the community and talking with residents about the issues facing its people, it seems likely that a small gardening project being implemented over the course of one summer was just not enough to create significant quantitative changes in community members' health and well-being. Current struggles within the community include substance abuse, unemployment and a lack of financial opportunity. The community also has an extremely young population, and a relative lack of older individuals able to provide positive leadership.

Although these challenges may have led to a lack of significant change in our quantitative measures, this information should not be taken to suggest that the institution of the project had no positive impacts on the community. Verbal accounts from certain community leaders suggest that some community members were positively influenced through involvement in the project. In particular, it was suggested that the elders facing disability who participated may have gained the most from being involved. These "environmental workers" were hired on earlier, participating in the project for approximately 3 months as opposed to 6 weeks for the youths. Several of these workers were highly involved, present almost every weekday for their scheduled duties. In

contrast, the majority of the youth were sporadic in their attendance and participation. It was suggested that these elderly workers benefited by having scheduled work and responsibility in the community. Some community members reported that the project helped one of these individuals in battling alcoholism. A more thorough qualitative investigation of these participants can be found in the work of Ray (2008). Quantitative measurements were not taken for these elderly individuals due to the small size of the group ($N = 6$).

Some characteristics of the program may have led to the lack of increase in well-being and other measures. Regular attendance of the program was a problem, with many of the youth having irregular attendance, or ceasing participation all together. Program organization also resulted in issues. Organizers engaged in disputes over project implementation and showed varying levels of commitment. This may have negated the community building goals of the project, at times creating conflict instead of cohesion. The goal of promoting intergenerational connection may also have fallen by the wayside over the course of the project. Although both young and old participants were involved in the project, they were not always working side by side, and were at times in conflict with one another. Since measures of intergenerational cohesion were not analyzed, it cannot be stated that no impact of the project was seen. However, it is likely that these relationships were not significantly strengthened.

In terms of connectedness to nature, a lack of increase in this measure over the course of the project may be partially explained by culture. Connection to nature is already a strong focus of Aboriginal culture (Zapf, 2005). Coupled with the fairly natural

setting of the community, the involvement in outdoor activity and experience with nature may not have been change enough to have any effect on participants.

Past research also suggested that a community garden could positively impact well-being through improved nutrition and availability of fresh produce (Blair, Giesecke & Sherman, 1991). However, community members managing the project chose to shift its focus from planting and maintaining the vegetable garden to the maintenance and reseeded of a community monument. As a result, the large vegetable garden produced a very small yield, consumed by a limited number of participants. Although the small garden boxes were more successful in growing vegetables, unskilled individuals did not gather full yields from these, and their consumption was likely limited to a small number of households. It is probable that several community members did have improved access and consumption of fresh vegetables, but they may have been individuals outside of the age range for our surveys. Because those directly involved did not necessarily have increased consumption of these foods, it is possible that the impact of vegetable consumption was minimal among those surveyed.

These observations and analyses emphasize the importance of combining both qualitative and quantitative analyses in community research. Without becoming involved in the community, and having discussions with community members, it would be impossible to accurately interpret the quantitative data collected. This approach of combining qualitative and quantitative information, known as mixed methods research, has been recommended by community researchers in other fields (Andrew & Halcomb, 2006). The complexity of interactions in a community is very difficult to capture in

quantitative data alone. A mixed methods approach allows for a more holistic and flexible analysis of community issues (Andrew & Halcomb, 2006).

In focusing on quantitative data in the study, issues arose in the collection of data for both garden and control communities. When collecting data from control groups, a sufficient number of participants were surveyed in the first round, but the second round proved to be much more challenging. The majority of those who completed the first round in these communities were Summer Students, hired by band councils to work for the summer season. However, the second measurement period took place after these contracts ended. Due to restraints posed by cost and distance, I was unable to personally visit these communities to canvas for these individuals to complete the second round survey. Band council members attempted to contact persons who had filled out the first round; however, this met very limited success. Unfortunately, after several attempts and strategies for obtaining data, it became obvious that sufficient data would not be collected within an appropriate time period to act as a control comparison.

In terms of the participating community of Ginoogaming, the outcome of the t-tests that were performed may have been affected by the relatively small sample size of participants that filled out both rounds of surveys ($N = 17$). The issue once again was that of attrition for the second round. Again, these participants were Summer Students who filled out the first round as their contracts began. These contracts had ended at the time of the second round, making it difficult to contact these individuals. Other factors added to the difficulty, including several participants leaving the community to attend school for the year, some participants facing incarceration, and others choosing not to participate. In the end, the sample may not have been representative, and was small and

limited in power. This challenge in data collection is an important factor to consider should further quantitative studies be performed with this population.

Time 1 Variable Analyses

Due to the aforementioned constraints, the most important function of these data became the investigation into relationships between well-being and other variables measured among the participants in round 1. Since this round of collection had a large number of participants ($N = 66$), it was possible to use these data to describe relationships between measured variables through correlations, regressions, and mediational analyses.

Well-being. It is important to first distinguish between the three measurements of well-being used in the study. Each scale represents a different aspect of well-being, with a different approach to its measurement. Therefore, it should be expected that each measure would have slightly different relationships to other measured variables. The PANAS focuses on the expression of positive and negative emotions as a rating of well-being (Watson et al., 1988). As used in our study, the measure captures a participant's general view of their affective or emotional well-being. Although this is a fairly global view of well-being, a person's perception of their emotional experiences tends to change over time. The PANAS measures emotional and affective well-being, but may not cover other aspects of well-being, such as life satisfaction and self-esteem. The Satisfaction with Life Scale is also a "trait" measure, but provides a more global assessment of well-being, recording an individual's overall evaluation of their life experience (Diener et al., 1985). This measure effectively gauges a person's conceptualization of their life experience, but provides less information about their emotional experiences and self-esteem. Finally, the measure of State Self-Esteem evaluates the participant's self-concept

at the time of the survey (Heatherton & Polivy, 1992). This approach evaluates well-being in the short term, as a function of their self-esteem. It is a “state” measurement, and therefore provides less information about long-term global and emotional aspects of well-being. Thus, each of these measures of well-being provided a separate and unique conceptualization. Analyzing all three measurements gave a more complete examination of well-being in participants. Each measure will be considered and discussed separately.

First, relationships to the emotional measure of well-being, the PANAS, will be discussed. The strongest relationship to PANAS was seen with the variable Aboriginal identity. This connection is very important to note, as it emphasizes the significance of culture and heritage in the lives of participating community members. Further evidence confirms the strength of this relationship in these data. A regression was performed to test whether Aboriginal identity, CNS or SOC would explain a significant amount of unique variance in PANAS measures. The test showed that only Aboriginal identity explained a significant amount of unique variance in this measure of well-being.

Past studies have found similar connections between Aboriginal identity and well-being in different contexts (Waldram et al., 2006). As well, some studies have shown that cultural identity can have varying impacts on well-being depending on ethnicity (Umana-Taylor & Shin, 2007). The current data show a very strong connection between cultural identity and well-being among Aboriginal Canadians in Northwestern Ontario. Although these data do not allow us to determine the causal direction of this relationship, it can be stated that cultural identity is of important consideration when studying the well-being of these populations. Other research has found positive associations between cultural identity and well-being in Native (Adams, Fryberg, Garcia & Delgado-Torres,

2006; Kirmayer, Simpson & Cargo, 2003) and other cultures (Branscombe, Schmitt & Harvey, 1999; Oyserman, Harrison & Bybee, 2001). These researchers view cultural identity as a positive resource that can improve resiliency and protect against the effects of societal oppression (Adams et al., 2006). The current study adds support to these claims, reinforcing the evidence of a strong relationship between Aboriginal identity and well-being. It also provides new information, as the form of well-being measured differs from that used in past studies. Adams and colleagues (2006) related Aboriginal identity to a self-esteem measure of well-being, similar to the SSE scale. As well, they looked at community efficacy and its relation to Aboriginal identity. They found that both the self-esteem and community efficacy measures had positive relationships to Aboriginal identity. The current study shows that Aboriginal identity is also strongly related to an emotional measure of well-being, the PANAS. This displays the connection between emotional displays and cultural identity, a new finding in this type of research.

The finding that Aboriginal identity has a strong connection to well-being may be valuable to agencies and policy makers who wish to design programs to improve the mental health of Aboriginal people in Northwestern Ontario and other areas of Canada. Several programs for the education and rehabilitation of First Nations peoples have successfully integrated cultural traditions and values into their teaching (Rubie, Townsend & Moore, 2004; Waldram, 1993; Hazel & Mohatt, 2001). This integration has led to improved outcomes for participants (Rubie et al., 2004; Waldram, 1993; Hazel & Mohatt, 2001). The current research supports the use of this approach, as it will likely have a positive impact on the well-being of program participants.

Another strong connection to PANAS was the measure of sense of community, the SCI. A significant relationship to the SWLS provides further evidence of the connection between sense of community and well-being. A mediational relationship was found where Aboriginal identity acted as a mediator between SCI and PANAS. This suggests that sense of community is not directly related to emotional well-being in this sample, but is rather related to Aboriginal identity, which in turn is related to emotional well-being (PANAS). Thus, sense of community only impacts emotional well-being through its effect on Aboriginal identity. In other words, people with high SCI scores tended to also experience more positive emotions, but only because of their additional tendency to have a stronger sense of Aboriginal identity. The study by Adams and colleagues (2006) also measured community efficacy, and found this was significantly correlated with Aboriginal identity. However, they did not test any mediational models relating these variables to well-being. Our results provide additional insight for this line of research, and reason for further investigation into the findings of these researchers.

The relationship between well-being and sense of community (SCI) reaches further complexity when considering results of the state self-esteem scale (SSE). Although a significant correlation was not observed between SCI and SSE, regression analysis showed SCI to explain a significant amount of variance in SSE. This relationship was negative, implying that as self-esteem increased, sense of community decreased. This is an interesting result, as it contradicts the findings of the other two measures of well-being. However, research has shown self-esteem to vary between cultures, with particular differences noted between individualistic and collectivistic cultures (Spencer-Rodgers, Peng, Wang, & Hou, 2004; Schmitt & Allik, 2005). In

individualistic cultures, such as those in the western world, self-esteem and well-being are assumed to relate to one another, with high self-esteem indicated greater well-being. However, among more collective cultures, high self-esteem may be viewed in more of a negative light, as it could be seen to work against the cooperative, communal mindset (Breton, 2007). Having close relationships one's family and community may be more important to well-being than self-esteem in these cases. Therefore, those with high self-esteem may be those who have a more western mindset, and do not feel as close to their community (Benet-Martinez & Karakitapoglu-Aygun, 2003; Kwan, Bond & Singelis, 1997). Aboriginal communities like the ones in the current study can be understood as more collective compared to other western communities, as they are small and tightly knit, with more sharing and openness than is typical in western society. This could explain the negative association between self-esteem and sense of community in our results.

Cultural appropriateness of the scales used in the current study is an important consideration. Although some of the scales have been verified across cultures, variance based on cultural differences still exists in many measures, particularly well-being (Spencer-Rodgers et al., 2004; Schmitt & Allik, 2005). In addition, Aboriginal cultures are quite unique, and a large amount of variance can be seen between individual communities. Therefore, it is very difficult to fully ensure that the scales used in the study are completely culturally appropriate. In fact, comparing these results to a sample of western-oriented community members could provide valuable information in terms of the differences in the endorsement of survey items.

Continuing with well-being, the SWLS was found to have several interesting relationships to other variables that were measured. Correlations showed that SWLS had a positive association with physical exercise. Community members who engaged in more physical activity and exercise are also more likely to report feeling satisfied with their lives. It can be hypothesized that an active, healthy lifestyle leads to more fulfilling and satisfying lives in these community members. Strong connections between physical and mental well-being and physical activity have been shown in past research (Penedo & Dahn, 2005). This information could be valuable in terms of encouraging community members to get active and lead more healthy lifestyles. Further investigation could reveal the relative impact of physical activity among community members, and the possible impact of changing habits around exercise.

Community members eating greater amounts of traditional food also reported being more satisfied with their lives. These results provide quantitative evidence of a significant relationship between healthy, natural food choices and mental health and well-being. Although evidence exists for the connection between well-being and healthy foods, rarely has this relationship been studied in the context of traditional Aboriginal foods. One researcher found qualitative evidence that consumption of traditional, subsistence foods increases well-being among First Nations people (Tait, 2006). In the case of traditional foods, satisfaction with life may be impacted both by the nutritional value of the food and the participation in cultural traditions. However, the current study cannot determine the causal direction of this relationship. Further research could be used to better understand this connection, potentially investigating whether changes in traditional food consumption directly affect well-being.

Aboriginal Identity. Strong connections were shown between Aboriginal identity and both sense of community and connectedness to nature. As mentioned previously, past research has displayed a significant connection between sense of community and Aboriginal identity (Adams et al., 2006). Research has yet to explore the relationship between Aboriginal identity and connectedness to nature through quantitative measures. However, it is understood that connection to land and to nature is an important aspect of First Nations' cultures (Dombrowski, 2007; Tait, 2006; Zapf, 2005). Qualitative researchers discuss this connection as an intertwined spirituality between Aboriginal persons and the natural world. Life is understood as a constant exchange with nature, resulting in interdependence between humans and the environment. This worldview contrasts greatly with the western views of individualism and separation from the environment (Zapf, 2005). The current study provides quantitative evidence of the relationship between Aboriginal identity and connection to nature.

Sense of community also shows a relation to connectedness to nature, but this is mediated through its relationship to Aboriginal identity. Both CNS and SCI are related to Aboriginal identity, but not necessarily to one another. This makes sense, considering that outside of the Aboriginal culture, it seems unlikely that sense of community would be related to one's connection to nature.

Interestingly, no significant relationship was found between Aboriginal identity and consumption of traditional food. Therefore, those indicating greater consumption of traditional Aboriginal foods were no more likely to indicate a greater sense of Aboriginal identity. This is contrary to qualitative research that points to traditional food as an important aspect of Aboriginal culture and identity (Dombrowski, 2007). It is possible

that the community members we studied had more complex relationships with Aboriginal identity, with other variables cancelling out the connection to traditional food consumption. A possible explanation is that younger community members consider traditional food consumption to be less important to their Aboriginal identity. It is possible that Aboriginal youth might focus on different aspects of their community, activities and culture in defining Aboriginal identity. Further quantitative research is needed to understand the relationship in this and other First Nations communities.

Connectedness to Nature. Those consuming more traditional foods were more likely to indicate a stronger connection to nature. This relationship has not yet been addressed in the research, and provides an interesting avenue for further investigation. It makes sense that those feeling connected to nature would be more likely to spend time in nature, and therefore be exposed to sources of natural, traditional foods. As well, those consuming traditional foods must spend time in nature, most likely fostering their feelings of connectedness. Having sustenance provided by nature would reinforce the importance of the natural environment, and make one's connection to the natural world more obvious. Since our data is correlational, the causal direction of this relationship cannot be determined. Further investigation is needed to better understand these variables and their relationship to the lifestyles of First Nations people.

Summary and Conclusions

The current project met with a share of challenges and obstacles in terms of collecting sufficient quantitative data for the originally proposed analyses. Pre-post data evaluating the impact of the gardening project failed to find any positive changes in community members, although this may have been affected by other influences in the

community. The result was also likely impacted by organizational factors of the project, including conflicted leadership, attendance, and gardening knowledge. The project is set to continue this summer, with changes and adaptations based upon qualitative observations of its operations.

It is suggested that in order to improve the impact and success of the project, support must be given to community organizers, particularly around gardening knowledge and skills. One of the major issues leading to a lack of participation and involvement in gardening was that organizers and workers simply did not know how to garden. Ensuring that these skills are built and shared throughout the community is essential. Although the project is community-based, and it is hoped that community members will be the driving force, people must first be given the skills and know-how that will allow them to strengthen and develop the program.

Accessibility was also an issue for community members, since the large garden was a good distance outside of the community core. Having the garden closer and more accessible to community members would increase involvement for both organizers and other community members.

If quantitative analysis of the project is undertaken in the future, it is suggested that different approaches be considered in order to have adequate data and to limit attrition. Perhaps reducing the number of scales or simplifying the measures would allow community members to respond quickly and easily, therefore increasing participation.

Analysis of the first round of data provided important insight into the opinions and experiences of community members. The relationships outlined in the discussion have value in terms of understanding Aboriginal viewpoints in Ginoogaming and other

First Nations communities. This information will be shared with the community, as well as other First Nations researchers, in order to expand the base of knowledge on this population and to aid future program development. Since the gardening project is ongoing, aspects of the research could be useful for band leaders as soon as this summer, in the organization of this year's garden. For example, the impact of the project on the well-being of participants could possibly be improved by including aspects of Aboriginal culture and tradition into the programming.

The results could also be valuable to other Aboriginal communities struggling with similar issues. It should be kept in mind however, that our data comes primarily from a single community. The diversity of Aboriginal communities limits the generalizability of the data collected. Even with First Nations communities in the same region, vast differences can be seen in cultures, traditions and lifestyles. This is an important consideration when interpreting and applying the information.

Future research should focus upon the relationship between the different forms of well-being and aspects of Aboriginal identity. Providing youth with a positive view of their cultural identity, one which is not in conflict with Western culture, could be key when working towards strengthening communities and improving quality of life.

Cultural identity appears to be intensely tied to well-being among these populations, and better understanding of this relationship could assist program developers and policy makers in providing effective support and assistance to First Nations people. For instance, evaluation of programs that incorporate Aboriginal beliefs and worldview could be completed to measure their impact on Aboriginal identity and well-being. This could be compared to other programs for Aboriginal populations that do not incorporate these

beliefs. Examples of such programs can be seen in the mental health and correctional fields (Waldram et al., 2006). Such evaluations could explore the direct implications of Aboriginal identity on well-being and program effectiveness.

Other research could help to elucidate the key factors leading to improved well-being in First Nations community programming. Connection to nature, sense of community, physical exercise and traditional food consumption are all possible areas for exploration. This type of research is extremely valuable as we attempt to provide the resources and supports that will improve the circumstances and quality of life among members of this disadvantaged population.

References

- Adams, G., Fryberg, S. A., Garcia, D. M., & Delgado-Torres, E. U. (2006). The psychology of engagement with indigenous identities: A cultural perspective. *Cultural Diversity and Ethnic Minority Psychology, 12*(3), 493-508.
- Andrew, S., & Halcomb, E. J. (2006). Mixed methods research is an effective method of enquiry for community health research. *Contemporary Nurse. Special Issue: Advances in Contemporary Community & Family Health Care, 23*(2), 145-153.
- Armstrong, D. (2000a). A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health and Place, 6*, 319-327.
- Armstrong, D. (2000b). A community diabetes education and gardening project to improve diabetes care in a Northwest American Indian tribe. *The Diabetes Educator, 26* (1), 113-119.
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology, 63*(4), 596-612.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

- Benet-Martinez, V. & Haritatos, J. (2002). Bicultural identities: The interface of cultural, personality, and socio-cognitive processes. *Journal of Research in Personality*, 36, 598-606.
- Benet-Martínez, V., & Karakitapoglu-Aygün, Z. (2003). The interplay of cultural syndromes and personality in predicting life satisfaction: Comparing Asian Americans and European Americans. *Journal of Cross-Cultural Psychology*, 34(1), 38-60.
- Blair, D., Giesecke, C. & Sherman, S. (1991). A dietary, social and economic evaluation of the Philadelphia Urban Gardening Project. *Journal of Nutrition Education*, 23, 161-167.
- Bookchin, M. (1980). *Toward an Ecological Society*. Montreal: Black Rose.
- Boss, J. (1999). Outdoor Education and the Development of Civic Responsibility. *Eric Digest* (January), 3-4.
- Branscombe, N. R., Schmitt, M. T., & Harvey, R. D. (1999). Perceiving pervasive discrimination among African Americans: Implications for group identification and well-being. *Journal of Personality and Social Psychology*, 77(1), 135-149.
- Breton, B. (2007). Individualism, collectivism and high self-esteem [Abstract]. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 68 (6-B), 4172.

- Bunting, C. & Townley, J. (1999). A synthesis of environmental and adventure education concepts: A professional responsibility. In J. Miles and S. Priest (eds) *Adventure Programming*, pp. 433-444. State College, PA: Venture Publishing.
- Cameron, J.E. (2004). A three factor model of social identity. *Self and Identity*, 3, 239-262.
- Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior*, 46(3), 244-259.
- Carter, J., Pugh, J. & Monterrosa, A. (1996). Non-insulin dependent diabetes mellitus in minorities in the United States. *Annals of Internal Medicine*, 125, 221-232.
- Chandler, M. J., & Lalonde, C. (1998). Cultural continuity as a hedge against suicide in Canada's First Nations. *Transcultural Psychiatry*, 35(2), 191-219.
- Cook, R., & Benton, D. (1993). The relationship between diet and mental health. *Personality and Individual Differences*, 14(3), 397-403.
- Crespo, C., Keteyian, S., Heath, G. & Sempos, C. (1996). Leisure-time physical activity among US adults, results from the Third National Health and Nutrition Examination Survey. *Archives of Internal Medicine*, 156, 93-98.

- Davidson, W. & Cotter, P. (1991). The relationship between sense of community and subjective well-being: A first look. *Journal of Community Psychology, 19* (3), 246-253.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75.
- Dombrowski, K. (2007). Subsistence livelihood, native identity and internal differentiation in southeast Alaska. *Anthropologica, 49*(2), 211-229.
- Evans, G. W., & McCoy, J. M. (1998). When buildings don't work: The role of architecture in human health. *Journal of Environmental Psychology. Special places, 18*(1), 85-94.
- Ewert, A. W., McCormick, B. P., & Voight, A. E. (2001). Outdoor experiential therapies: Implications for TR practice. *Therapeutic Recreation Journal, 35*(2), 107-122.
- Farrell, S. J., Aubry, T., & Coulombe, D. (2004). Neighborhoods and neighbors: Do they contribute to personal well-being? *Journal of Community Psychology, 32*(1), 9-25.
- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Evanston, Il: Row, Peterson.

Fisher, E., Auslander, W., Sussman, L., Owens, N. & Jackson-Thompson, J. (1992).

Community organization and health promotion in minority neighborhoods:

Proceedings of the NIH Workshop on Health Behavior Research in Minority

Populations. *Ethnicity and Disease*, 2, 252-272.

Ford, E., Merritt, R., Heath, G., Powell, K., Washburn, R., Kriska, A. & Haile, G. (1991).

Physical activity behaviors in lower and higher socioeconomic status populations.

American Journal of Epidemiology, 133 (12), 1246-1256.

Fraser, M. & Galinsky, M. (1997). Toward a Resilience-based Model of Practice. In M.

Fraser (ed.) *Risk and Resilience in Childhood: An Ecological Perspective*, pp. 265-

275. Washington, DC: NASW Press.

Francis, M., Lindsey, P. & Rice, J. (1994). *The Healing Dimensions of People-Plant*

Relations: Proceedings of a Research Symposium. Center for Design Research,

Department of Environmental Design, UC Davis, CA.

Glover, T. D. (2003). The story of the Queen Anne memorial garden: Resisting a

dominant cultural narrative. *Journal of Leisure Research*, 35(2), 190-212.

Hartig, T., Evans, G. W., Jamner, L. D., Davis, D. S., & Gärling, T. (2003). Tracking

restoration in natural and urban field settings. *Journal of Environmental Psychology*

Special Issue: Restorative Environments, 23(2), 109-123.

- Hawkins, E. H., Cummins, L. H., & Marlatt, G. A. (2004). Preventing substance abuse in American Indian and Alaska native youth: Promising strategies for healthier communities. *Psychological Bulletin*, 130(2), 304-323.
- Hazel, K. L., & Mohatt, G. V. (2001). Cultural and spiritual coping in sobriety: Informing substance abuse prevention for Alaska Native communities. *Journal of Community Psychology. Special Issue: Spirituality, Religion, and Community Psychology II: Resources, Pathways, and Perspectives*, 29(5), 541-562.
- Heatherton, T. F. & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, 60 (6), 895-910.
- Herrero, J., Meneses, J., Valiente, L., & Rodríguez, F. (2004). Online social participation/Participación social en contextos virtuales. *Psicothema*, 16(3), 456-460.
- Hirsch, J. (1999). Developmental adventure programs. In J.C. Miles & S. Priest (eds), *Adventure Programming*, pp. 439-444. State College, PA: Venture Publishing.
- Hlubik, W., Hamm, M., Winokur, M. & Baron, M. (1994). Incorporating research with community gardens: the New Brunswick Community Gardening and Nutrition Program. In M. Francis, P. Lindsey & J. Rice (eds) *The Healing Dimensions of People-Plant Relations: Proceedings of a Research Symposium*. Center for Design Research, Department of Environmental Design, UC Davis, CA, pp. 59-64.

Jilek, W. & Roy, C. (1976). Homicide committed by Canadian Indians and Non-Indians.

International Journal of Offender Therapy Comparative Criminology, 20, 201-216.

Kaplan, H. B. (1999). Toward an understanding of resilience: A critical review of

definitions and models. In M. D. Glantz, & J. L. Johnson (Eds.), *Resilience and*

Development: Positive Life Adaptations. (pp. 17-83). Dordrecht, Netherlands:

Kluwer Academic Publishers.

Kazaleh, F. A. (1986). Biculturalism and adjustment: A study of Ramallah-American

adolescents in Jacksonville, Florida. ProQuest Information & Learning. *Dissertation*

Abstracts International, 47 (2), 448.

Kirby, L. & Fraser, M. (1997). Risk and resilience in childhood. In M. Fraser (ed.) *Risk*

and Resilience in Childhood: An Ecological Perspective, pp. 10-33. Washington,

DC: NASW Press.

Kirmayer, L. J. (1994). Suicide among Canadian Aboriginal peoples. *Transcultural*

Psychiatric Research Review, 31(1), 3-58.

Kirmayer, L., Simpson, C., & Cargo, M. (2003). Healing traditions: Culture, community

and mental health promotion with Canadian Aboriginal peoples. *Australasian*

Psychiatry, 11(Suppl1), S15-S23.

- Klaczynski, P. A., Goold, K. W., & Mudry, J. J. (2004). Culture, obesity stereotypes, self-esteem, and the "thin ideal": A social identity perspective. *Journal of Youth and Adolescence, 33*(4), 307-317.
- Kwan, V. S. Y., Bond, M. H., & Singelis, T. M. (1997). Pancultural explanations for life satisfaction: Adding relationship harmony to self-esteem. *Journal of Personality and Social Psychology, 73*(5), 1038-1051.
- Labbé, E. E., Welsh, M. C., & Delaney, D. (1988). Effects of consistent aerobic exercise on the psychological functioning of women. *Perceptual and Motor Skills, 67*(3), 919-925.
- LaFromboise, T. D., Hoyt, D. R., Oliver, L., & Whitbeck, L. B. (2006). Family, community, and school influences on resilience among American Indian adolescents in the upper midwest. *Journal of Community Psychology. Special Issue: Addressing Mental Health Disparities through Culturally Competent Research and Community-based Practice, 34*(2), 193-209.
- LaFromboise, T., Coleman, H. L., & Gerton, J. (1993). Psychological impact of biculturalism: Evidence and theory. *Psychological Bulletin, 114*(3), 395-412.
- Libman, K. (2007). Growing youth growing food: How vegetable gardening influences young people's food consciousness and eating habits. *Applied Environmental Education and Communication, 6*, 87-95.

- Logan, A. C. (2006). *The Brain Diet: The Connection between Nutrition, Mental Health, and Intelligence*. Nashville, TN: Cumberland House Publishing.
- Loomis, C., Dockett, K. H., & Brodsky, A. E. (2004). Change in sense of community: An empirical finding. *Journal of Community Psychology, 32*(1), 1-8.
- MacCauley, A., Montour, L., & Adelson (1988). Prevalence of diabetic and atherosclerotic complications among Mohawk Indians of Kahnawake, PQ. *Canadian Medical Association Journal, 139*, 221-224.
- MacCauley, A., Pardis, G., Potvin, L., et al. (1997). The Kahnawake School Diabetes Prevention Project: intervention, evaluation, and baseline results of diabetes primary prevention program with a Native community in Canada. *Preventive Medicine, 26*, 779-790.
- Mashek, D., Stuewig, J., Furukawa, E., & Tangney, J. (2006). Psychological and behavioral implications of connectedness to communities with opposing values and beliefs. *Journal of Social & Clinical Psychology, 25*(4), 404-428.
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 56*(3), 227-238.
- Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology, 24*(4), 503-515.

- Mayer-Smith, J., Bartosh, O. & Peterat, L. (2007). Teaming children and elders to grow food and environmental consciousness. *Applied Environmental Education and Communication, 6*, 77-85.
- McBey, M. (1985). The therapeutic aspects of gardens and gardening: an aspect of total patient care. *Journal of Advanced Nursing, 10*, 591-595.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology Special Issue: Psychological sense of community, I: Theory and concepts, 14*(1), 6-23.
- National Aboriginal Health Organization (NAHO), (2004). *Preliminary Findings of the First Nations Regional Longitudinal Health Survey (RHS) 2002-2003: Adult Survey*. Ottawa: NAHO.
- Neill, J. & Heubeck, B. (1998). Adolescent coping styles and outdoor education: searching for the mechanisms of change. In C. Itin (ed.) *Exploring the Boundaries of Adventure Therapy: International Perspective*, pp. 227-243. Boulder, CO: Association for Experiential Education.
- Oyserman, D., Harrison, K., & Bybee, D. (2001). Can racial identity be promotive of academic efficacy? *International Journal of Behavioral Development, 25*(4), 379-385.

- Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry, 18*(2), 189-193.
- Perkins, D. D., Florin, P., Rich, R. C., & Wandersman, A. (1990). Participation and the social and physical environment of residential blocks: Crime and community context. *American Journal of Community Psychology, 18*(1), 83-115.
- Pretty, G. M. H., Andrewes, L., & Collett, C. (1994). Exploring adolescents' sense of community and its relationship to loneliness. *Journal of Community Psychology, 22*(4), 346-358.
- Pretty, G. M. H., Conroy, C., Dugay, J., & Fowler, K. (1996). Sense of community and its relevance to adolescents of all ages. *Journal of Community Psychology, 24*(4), 365-379.
- Ray, L. (2008). *Exploring Well-being in a First Nations Community: A Qualitative Study*. Unpublished master's thesis, Lakehead University, Thunder Bay, Ontario, Canada.
- Romer, D. (ed.) (2003). *Reducing Adolescent Risk: Toward an Integrated Approach*. Thousand Oaks, CA: Sage.

- Roussi, P., Rapti, F., & Kiosseoglou, G. (2006). Coping and psychological sense of community: An exploratory study of urban and rural areas in Greece. *Anxiety, Stress & Coping: An International Journal*, 19(2), 161-173.
- Rubie, C. M., Townsend, M. A. R., & Moore, D. W. (2004). Motivational and academic effects of cultural experiences for indigenous minority students in New Zealand. *Educational Psychology*, 24(2), 143-160.
- Russell, K. (2000). Exploring how the wilderness therapy process relates to outcomes. *Journal of Experiential Education*, 23(3), 170-176.
- Russell, K. (2003). An assessment of outcomes in outdoor behavioral healthcare treatment. *Child & Youth Care Forum*, 32(6), 355-381.
- Rutter, M., Giller, H., & Hagell, A. (1998). *Antisocial Behavior by Young People*. New York, NY, US: Cambridge University Press.
- Sarason, S. B. (1974). *The Psychological Sense of Community: Prospects for a Community Psychology*. Oxford, England: Jossey-Bass.
- Schmitt, D. & Allik, J. (2005). Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: Exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology*, 89 (4), 623-642.

- Schultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology, 21*(4), 327-339.
- Sommer, R., Learey, F., Summitt, J., & Tirrell, M. (1994). Social benefits of resident involvement in tree planting: comparison with developer-planted trees. *Journal of Arboriculture, 20* (6), 323-328.
- Spencer-Rodgers, J., Peng, K., Wang, L. & Hou, Y. (2004). Dialectical self-esteem and East-West differences in psychological well-being. *Personality and Social Psychology Bulletin, 30* (11), 1416-1432.
- Tait, H. (2006). *Harvesting and Community Well-being among Inuit in the Canadian Arctic : Preliminary Findings from the 2001 Aboriginal Peoples Survey - Survey of Living Conditions in the Arctic, 2001* (Statistics Canada Publication No. 89-619). Ottawa: Statistics Canada, Social and Aboriginal Statistics Division.
- Tajfel, H. & Turner, J. (1979). An integrative theory of intergroup conflict. In W.G. Austin & S. Worchel (Eds.), *The Social Psychology of Intergroup Relations* (pp. 33-47). Monterey, CA: Brooks-Cole.
- Ulrich, R. (1984). View through a window may influence recovery from surgery. *Science, 224*, 420-421.
- Umaña-Taylor, A. J., & Shin, N. (2007). An examination of ethnic identity and self-esteem with diverse populations: Exploring variation by ethnicity and geography. *Cultural Diversity and Ethnic Minority Psychology, 13*(2), 178-186.

- Ungar, M., Dumond, C. & McDonald, W. (2005). Risk, resilience and outdoor programmes for at-risk children. *Journal of Social Work, 5*(3), 319-338.
- van den Berg, Agnes E., Hartig, T. & Staats, H. (2007). Preference for nature in urbanized societies: Stress, restoration, and the pursuit of sustainability. *Journal of Social Issues, 63*(1), 79-96.
- Villacorta, M., Koestner, R., & Lekes, N. (2003). Further validation of the motivation toward the environment scale. *Environment and Behavior, 35*(4), 486-505.
- Waldram, J. B. (1993). Aboriginal spirituality: Symbolic healing in Canadian prisons. *Culture, Medicine and Psychiatry, 17*(3), 345-362.
- Waldram, J., Herring, A., & Young, T. (2006). *Aboriginal Health in Canada: Historical, Cultural, and Epidemiological Perspectives (2nd Ed.)*. Toronto: University of Toronto Press.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.
- Zapf, M. K. (2005). The spiritual dimension of person and environment: Perspectives from social work and traditional knowledge. *International Social Work, 48*(5), 633-642.

Appendix 1: Coverletter

Mirella Stroink
Department of Psychology
Phone: (807) 346-7874
Office: SN 1017
mstroink@lakeheadu.ca

Graham Trull
Lakehead University
Phone: 343-8367 (Lab)
Rm: 1067 BB
Email: gtrull@lakeheadu.ca

Dear Possible Participant,

I am a graduate student at Lakehead University, starting a study that looks at people and how they deal with their surroundings. This research will hopefully help out your community and others like it.

In this study you will be asked to choose how much you agree with several different statements. These statements are about thoughts and feelings you might have and some of the ways you act. You will also answer other questions about your beliefs. When you finish the questions and hand them in, you will be entered in the prize draw that will take place this June.

This research has been approved by the Lakehead University Senate Research Ethics Board. Dr. Mirella Stroink and I will be the only ones allowed to see the information you give. Your answers to the questions are **anonymous**. This means that we will not be able to tell which study package was yours, so we won't know which answers you have given to the questions. The information you give will be kept at Lakehead University for 7 years.

Participation in this study is completely **voluntary**. This means that if, for any reason, you do not want to finish the questions, or any part of the study, then you don't have to. Also, you can leave the study at any time without penalty. If you want to be part of the study, you must sign the informed consent form.

If you want more information about this study or have any questions or concerns please feel free to contact myself or Dr. Stroink using the e-mail addresses and telephone numbers at the top of the page, or the Lakehead University Research Ethics Board at (807) 343-8283. We are very excited to have you help out by completing this study!

Thanks so much,

Graham Trull

Appendix 2: Parent Coverletter

Mirella Stroink
Department of Psychology
Phone: (807) 346-7874
Office: SN 1017
mstroink@lakeheadu.ca

Graham Trull
Lakehead University
Phone: 343-8367 (Lab)
Rm: 1067 BB
Email: gtrull@lakeheadu.ca

Dear Parent,

Your child is being asked to participate in research related to a project that is taking place in your community. The project involves members of your community teaming with Lakehead University faculty and students to create a community vegetable garden and career promotion week.

The study your child has been asked to complete looks at people and how they deal with their surroundings. This research will hopefully benefit both your community and others like it. This letter explains how the study works, and asks for you to allow your child to take part by signing the attached consent form.

In this study your child will be asked to choose how much he/she agrees with several different statements. These statements are about thoughts and feelings they might have and some of the ways they act. They will also answer other questions about their beliefs. When they finish the questions and hand them in, they will be entered in a prize draw that will take place this June.

This research has been approved by the Lakehead University Senate Research Ethics Board. Dr. Mirella Stroink and I will be the only ones allowed to see the information your child gives. Their answers to the questions are **anonymous**. This means that we will not be able to tell which study package was theirs, so we won't know which answers they have given to the questions. The information they give will be kept at Lakehead University for 7 years.

Participation in this study is completely **voluntary**. This means that if, for any reason, your child does not want to finish the questions, or any part of the study, then they don't have to. Also, they can leave the study at any time without penalty. If they want to be part of the study, you must sign the informed consent form on the next page.

If you want more information about this study or have any questions or concerns please feel free to contact myself or Dr. Stroink using the e-mail addresses and telephone numbers at the top of the page, or the Lakehead University Research Ethics Board at (807) 343-8283.

We thank you very much for helping us complete this important research.
Sincerely,

Graham Trull

Appendix 3: Consent Form

Mirella Stroink
Department of Psychology
Phone: (807) 346-7874
Office: SN 1017
mstroink@lakeheadu.ca

Graham Trull
Lakehead University
Phone: 343-8367 (Lab)
Rm: 1067 BB
Email: gtrull@lakeheadu.ca

Informed Consent Form

The study we are asking your child to complete measures a number of their personal qualities such as the way that they interact with people and things around them, their health, and their culture. They will be asked to answer questions about how they see themselves, as well as some of their values and opinions. The researchers in charge of the study are Dr. Mirella Stroink, and Graham Trull, a graduate student in Clinical Psychology at Lakehead University.

By signing this form, I indicate that I understand:

1. That I give permission for my child to participate in the study.
2. That my child is a volunteer, that he/she can choose not to answer any question, and is free to stop doing the study at any time without penalty
3. That there are no risks in doing this study
4. That those using the information your child gives in the study will not be able to tell which answers were theirs, and that no information given in the study will be shared with anyone except the researchers
5. That I can ask to get information about the project after my child has completed the study.

Placing my name below shows that I have read and understand the information above and I agree to allow my child to participate in the study.

Name (please print): _____

Signature: _____

Date: _____

Appendix 4: Questionnaire
COMMUNITY SURVEY

We are interested in learning about some of the thoughts and feelings you have about yourself, the food you eat, and your community. There are no right or wrong answers! Try to answer as honestly as you can. If you volunteer to take this survey, you can choose not to answer any question that you do not want to answer, and you can stop doing the survey if you want to without penalty. Please do not put your name on the survey. Nobody will be able to tell which answers were yours. If you want more information about the survey, please ask Graham or phone: (807) 346-7874. When the whole study is done, you can get a summary of the results using the contact information on the cover letter. We thank you very much for your time and help! Please continue if you agree to participate in the survey.

CODE NAME

Instructions: Please answer these questions carefully, by circling the correct response. You may be taking a similar survey again in the fall, so we need to create a code name for you that we can use to match your answers on the two surveys, but that cannot identify who you are. It is very important that these questions are answered honestly and accurately both times!

1. What is the second letter of your first name?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

2. What month were you born in?

January	February	March	April	May	June	July	August	September	October	November	December
---------	----------	-------	-------	-----	------	------	--------	-----------	---------	----------	----------

3. What is the first letter in your mother's first name?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

4. What is the last number in your address (house number)?

0 1 2 3 4 5 6 7 8 9

5. What month was your mother born in?

January	February	March	April	May	June	July	August	September	October	November	December
---------	----------	-------	-------	-----	------	------	--------	-----------	---------	----------	----------

6. What is the first letter of your middle name?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

BACKGROUND INFORMATION:

1. Sex: Male _____ Female _____ Other _____

2. Age: _____

3. How would you describe your abilities in each of the following languages?

1	2	3	4	5
Not at all	With Difficulty	Somewhat	Fairly Well	Very Well

- _____ 1. How well can you understand the language of your Aboriginal ancestry (e.g. Cree, Ojibway)?
 _____ 2. How well can you speak the language of your Aboriginal ancestry (e.g. Cree, Ojibway)?
 _____ 3. How well can you understand English?
 _____ 4. How well can you speak English?

4. What is your first language (e.g. English, Aboriginal language): _____

5. In what places do you tend to use your Aboriginal language (check all that apply):

_____ with friends _____ with parents _____ with other family
 _____ at work _____ at school _____ other: _____

6. How many hours do you think you spend outside in an average week? _____

7. How many hours do you think you spend watching TV in an average week? _____

8. How many hours do you think you spend playing video games in an average week? _____

9. Your community will be making vegetable gardens this year. How much did you already know about this project (circle one)?

1	2	3	4	5
Never	A little	Some	Quite a bit	I knew a lot
Heard of it				about it already

Instructions: Below are ten sentences that you may agree or disagree with. Read each sentence and then tell us how much you agree with it by putting a number from 1 to 5 on the line next to it.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

- ___ 1. I often feel a sense of oneness with the natural world around me.
- ___ 2. I think of the natural world as a community to which I belong.
- ___ 3. I recognize and appreciate the intelligence of other living organisms.
- ___ 4. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
- ___ 5. I often feel a kinship with animals and plants.
- ___ 6. I feel as though I belong to the Earth as equally as it belongs to me.
- ___ 7. I have a deep understanding of how my actions affect the natural world.
- ___ 8. I often feel part of the web of life.
- ___ 9. I feel that all inhabitants of Earth, human, and nonhuman, share a common "life force".
- ___ 10. Like a tree can be part of a forest, I feel embedded within the broader natural world.

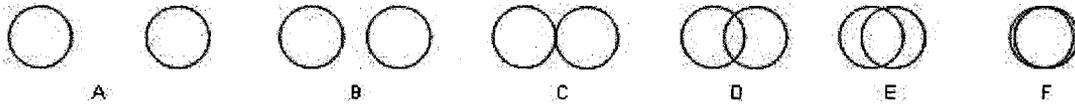
Instructions: Below are twelve sentences that you may agree or disagree with. Read each sentence and then tell us how much you agree with it by putting a number from 1 to 5 on the line next to it.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

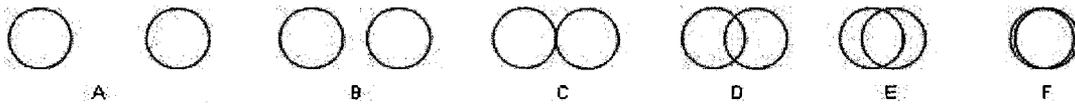
- ___ 1. I think my community is a good place for me to live.
- ___ 2. People in this community do not share the same values.
- ___ 3. Other community members and I want the same things from the community.
- ___ 4. I can recognize most of the people who live in my community.
- ___ 5. I feel at home in this community.
- ___ 6. Very few community members know me.
- ___ 7. I care about what other community members think of my actions.
- ___ 8. I have almost no influence over what this community is like.
- ___ 9. If there is a problem in this community, people who live here can get it solved.
- ___ 10. It is very important to me to live in this particular community.
- ___ 11. People in this community generally don't get along with each other.
- ___ 12. I expect to live in this community for a long time.

Instructions: Answer each of the following questions by circling one of the pairs of circles labeled A through F. In each pair, the circle to the left represents yourself, while the circle on the right represents the people or group in the question.

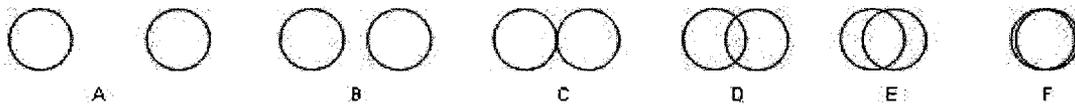
1. Circle the picture that best describes your relationship with the Canadian cultural community.



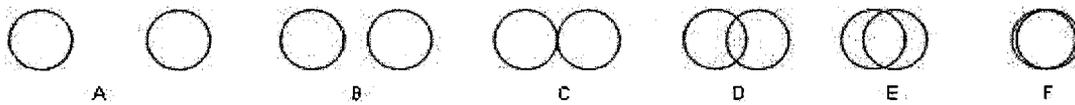
2. Circle the picture that best describes your relationship with the Aboriginal community.



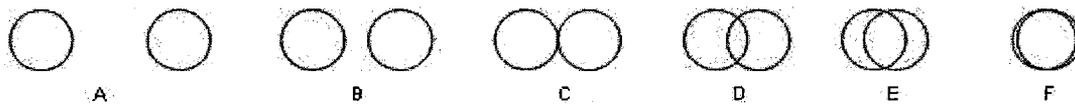
3. Circle the picture that best describes your relationship to your First Nations community (eg. Ginoogaming, Long Lake 58, or Aroland).



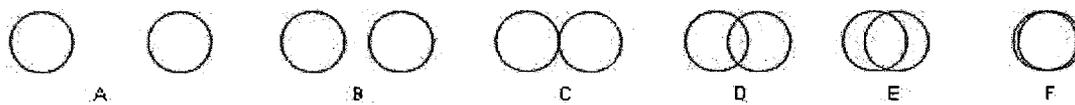
4. Circle the picture that best describes your relationship to other youth in your community.



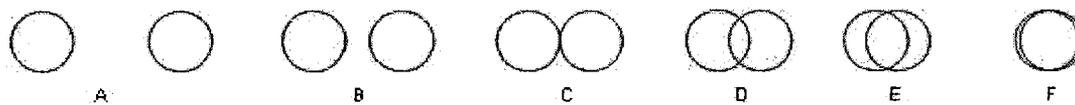
5. Circle the picture that best describes your relationship to the elders in your community.



6. Circle the picture that best describes your relationship to your family.



7. Circle the picture that best describes your relationship to your friends.



Instructions: Below are five sentences that you may agree or disagree with. Read each sentence and then tell us how much you agree with it by putting a number from 1 to 5 on the line next to it.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

- _____ In most ways my life is close to my ideal.
- _____ The conditions of my life are excellent.
- _____ I am satisfied with my life.
- _____ So far I have gotten the important things I want in life.
- _____ If I could live my life over, I would change almost nothing.

Instructions: Below is a list of words that describe different feelings and emotions. Read each one and tell us how much you generally feel that way by putting a number from 1 to 5 on the line next to it. On average, how much do you feel each of these emotions?

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

- | | |
|--------------------|------------------|
| _____ interested | _____ irritable |
| _____ distressed | _____ alert |
| _____ excited | _____ ashamed |
| _____ upset | _____ inspired |
| _____ strong | _____ nervous |
| _____ guilty | _____ determined |
| _____ scared | _____ attentive |
| _____ hostile | _____ jittery |
| _____ enthusiastic | _____ active |
| _____ proud | _____ afraid |

Instructions: Below are ten sentences about your current thoughts and feelings. Read each sentence and then tell us how much you feel that way **RIGHT NOW**, at this moment, by putting a number from 1 to 5 on the line next to it.

1	2	3	4	5
Not at all	A little	Somewhat	Very Much	Extremely

- ____ 1. I feel confident about my abilities.
- ____ 2. I am worried about whether I am regarded as a success or failure.
- ____ 3. I feel frustrated or rattled about my performance.
- ____ 4. I feel self-conscious.
- ____ 5. I feel as smart as others.
- ____ 6. I feel displeased with myself.
- ____ 7. I feel good about myself.
- ____ 8. I am worried about what other people think of me.
- ____ 9. I feel concerned about the impression I am making.
- ____ 10. I am worried about looking foolish.

Instructions: Please answer the following questions about your health as honestly as possible.

1. How would you rate the nutritional quality of your diet?
 Poor Fair Good Very Good Excellent
2. Would you say your health, in general, is:
 Poor Fair Good Very Good Excellent
3. How many times a week do you participate in physical exercise or recreation?
 0 1 - 2 3 - 4 5 or more times per week
4. Have you been told by a health care provider that you are overweight?
 Yes No
5. Do you currently suffer from any medical conditions which may be related to your diet and/or physical fitness (eg. diabetes, kidney problems)?
 Yes No
6. How many times have you visited a medical professional (eg. doctor, nurse, mental health worker) over the past 6 months?
 0 1 - 3 4 - 7 8 or more times
7. How many days have you spent as a patient in a medical facility, such as a hospital, over the past year?
 0 1-3 4-7 more than one week more than one month

Instructions: The questions on the next 2 pages ask about your thoughts on the food that you eat. Please read each question and respond by circling a number using the scale provided.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I am able to access enough food to meet my needs.	1	2	3	4	5
2. I am able to access the kinds of food that I need.	1	2	3	4	5
3. I have easy access to sources of nutritious food.	1	2	3	4	5
4. Obtaining nutritious food is not a problem for me.	1	2	3	4	5
5. I trust that the ways I access food will continue to be available into the future.	1	2	3	4	5
6. I am able to access nutritious food in ways that are acceptable to me.	1	2	3	4	5
7. The ways that I access food are reliable.	1	2	3	4	5
8. I know several different ways to access food.	1	2	3	4	5
9. I am able to access nutritious food in ways that are acceptable to my culture.	1	2	3	4	5
10. I know how to get enough nutritious food to meet my needs.	1	2	3	4	5
11. The ways that I access food are safe.	1	2	3	4	5
12. I sometimes worry that I will run out of food.	1	2	3	4	5
13. I trust my sources of food.	1	2	3	4	5
14. I am confident in my ability to get the food that I need.	1	2	3	4	5
15. I worry that I will not be able to access enough food to meet my needs.	1	2	3	4	5
16. I am not confident in my sources of food.	1	2	3	4	5
17. I do not have a secure source of food.	1	2	3	4	5
18. In the past year, you or your family have worried that food would run out	1	2	3	4	5
19. In the past year, the food that you and your family had would run out, and there would be no way to get more.	1	2	3	4	5
20. In the past year, you and your family could not access the food you needed to eat balanced meals.	1	2	3	4	5
21. In the past year, you or members of your family did not eat enough because there was not enough food.	1	2	3	4	5

Instructions: Think about the food that you usually eat and where it comes from. How much do you use each of the following methods to get your daily food (use the scale below to fill in a number next to each method):

Not available in my community	Never or very rarely	Rarely	Sometimes	Often	Always or almost always
0	1	2	3	4	5

- | | |
|--|----------------------------------|
| ___ 1. Big grocery store | ___ 9. Fishing |
| ___ 2. Convenience store | ___ 10. Hunting |
| ___ 3. Gathering berries | ___ 11. Trapping |
| ___ 4. Gathering herbs | ___ 12. Food bank |
| ___ 5. Gathering medicinal plants | ___ 13. Sharing food with others |
| ___ 6. Gathering wild rice | ___ 14. Other: _____ |
| ___ 7. Gathering other forest products | ___ 15. Other: _____ |
| ___ 8. Growing vegetables in a garden | ___ 16. Other: _____ |

Are there certain foods that you need or would like to eat that are difficult to get, or are not available, in your community?

Yes

No

If yes, what are those foods - and why are they difficult to get or not available?

Which of the following equipment or methods for food storage and preparation are used in your home (check all that apply)?

- | | | | |
|---|---------------------------------------|--------------------------------------|--|
| <input type="checkbox"/> gas/electric stove | <input type="checkbox"/> hotplate | <input type="checkbox"/> wood stove | <input type="checkbox"/> gas/electric oven |
| <input type="checkbox"/> microwave | <input type="checkbox"/> open fire | <input type="checkbox"/> barbeque | <input type="checkbox"/> freezer |
| <input type="checkbox"/> refrigerator | <input type="checkbox"/> food canning | <input type="checkbox"/> root cellar | <input type="checkbox"/> ice house |
| <input type="checkbox"/> food drying/dehydrator | | | |
| <input type="checkbox"/> Other: _____ | | | |

Instructions: Below are twelve sentences that you may agree or disagree with. Read each sentence and then tell us how much you agree with it by putting a number from 1 to 5 on the line next to it.

1
Strongly
Disagree

2
Disagree

3
Neutral

4
Agree

5
Strongly
Agree

- ___ 1. If I wanted to start a small business, I could count on support from the Band.
- ___ 2. If myself, or someone in my family wanted to receive job training or education, we could receive support from the Band.
- ___ 3. Generally speaking, most people in this community try to be helpful to each other.
- ___ 4. Generally speaking, most people in this community can be trusted.
- ___ 5. I find that different groups in this community don't mingle much with each other.
- ___ 6. People in this community tend to always associate with the same group of people.
- ___ 7. If I wanted to start a small business, I could count on support from First Nations organizations outside this community.
- ___ 8. If myself, or someone in my family wanted to receive job training or education, we could receive support from a First Nations organization outside this community.
- ___ 9. First Nations organizations try to do the best for my community.
- ___ 10. Generally speaking, people from other First Nations communities treat me in a fair way.
- ___ 11. My community works together with other First Nations to improve the situation of First Nations people.
- ___ 12. I have friends in different First Nations communities that I communicate with regularly.
- ___ 13. Organizations and governments are a valuable resource for this community.
- ___ 14. In the past five years, organizations and governments have invested resources in this community (for example, restoring land or water from environmental damage).
- ___ 15. Generally speaking, organizations and governments try to do the best for my community.
- ___ 16. This community can expect fair treatment from organizations and governments.
- ___ 17. My community works together with organizations and governments to improve our situation.
- ___ 18. I can get in contact with different organizations and government departments if I need to.

Instructions: The following questions ask for your thoughts and feelings about both your Aboriginal and Canadian cultural identities. Next to each sentence, tell us how much you agree or disagree with it as it applies to your Aboriginal and Canadian cultural identities.

	Aboriginal Culture					Canadian Culture				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. In general, being a member of this culture is an important part of my self-image.	1	2	3	4	5	1	2	3	4	5
2. I often think about the fact that I am a member of this culture.	1	2	3	4	5	1	2	3	4	5
3. I find it difficult to form a bond with other members of this culture.	1	2	3	4	5	1	2	3	4	5
4. In general, I'm glad to be a member of this culture.	1	2	3	4	5	1	2	3	4	5
5. I don't feel good about being a member of this culture.	1	2	3	4	5	1	2	3	4	5
6. I have a lot in common with other members of this culture.	1	2	3	4	5	1	2	3	4	5
7. The fact that I am a member of this culture rarely enters my mind.	1	2	3	4	5	1	2	3	4	5
8. I don't feel a sense of being "connected" with other members of this culture.	1	2	3	4	5	1	2	3	4	5
9. I often regret that I am a member of this culture.	1	2	3	4	5	1	2	3	4	5
10. I feel strong ties to other members of this culture.	1	2	3	4	5	1	2	3	4	5
11. Being a member of this culture has very little to do with how I feel about myself.	1	2	3	4	5	1	2	3	4	5
12. Generally, I feel good when I think about myself as being a member of this culture.	1	2	3	4	5	1	2	3	4	5
13. I tend to surround myself with people from this culture.	1	2	3	4	5	1	2	3	4	5
14. I often participate in traditions of this culture.	1	2	3	4	5	1	2	3	4	5
15. I enjoy social activities with people from this culture.	1	2	3	4	5	1	2	3	4	5
16. It is important to me to maintain or develop the practices of this culture.	1	2	3	4	5	1	2	3	4	5
17. I believe in the values of this culture.	1	2	3	4	5	1	2	3	4	5
18. I am interested in having friends from this culture.	1	2	3	4	5	1	2	3	4	5

Instructions: Please respond to each of the following sentences. Circle the number to the right that best reflects how much you agree or disagree with each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I believe that I can be a full member of both the Canadian and Aboriginal communities.	1	2	3	4	5
2. I will never be able to fully belong to both the Canadian and Aboriginal cultures at once.	1	2	3	4	5
3. It is not possible for me to be both Aboriginal and Canadian.	1	2	3	4	5
4. It is possible to be a fully accepted member of both the Canadian and Aboriginal cultures.	1	2	3	4	5
5. I believe that I can be a full member of both my Aboriginal and Canadian cultural groups.	1	2	3	4	5
6. I believe that in order to be truly Canadian I cannot also be a full member of my Aboriginal culture.	1	2	3	4	5
7. I believe that in order to be a full member of my Aboriginal culture, I cannot also be truly Canadian.	1	2	3	4	5
8. I believe it is possible to identify with both Canada and my Aboriginal culture.	1	2	3	4	5
9. To be fully Canadian, I have to hide or alter my Aboriginal identity.	1	2	3	4	5
10. To be fully Aboriginal, I have to hide or alter my Canadian identity.	1	2	3	4	5
11. I am conflicted between the Canadian and Aboriginal ways of doing things.	1	2	3	4	5
12. I feel like someone moving between two cultures.	1	2	3	4	5
13. I feel caught between the Aboriginal and Canadian cultures.	1	2	3	4	5
14. I do not feel trapped between the Aboriginal and Canadian cultures.	1	2	3	4	5

Instructions: We would like to learn about the skills that you think you need in order to be a successful, well-adjusted person. Please rate each of the following on how necessary it is to your understanding of what it means to be a successful person using the scale provided.

Not at all necessary	Slightly necessary	Somewhat necessary	Quite necessary	Very necessary
1	2	3	4	5

1. ____ Being a good steward or protector of the land that provides for me.
2. ____ Being able to catch, hunt, grow, or raise my own fish, meat, or vegetables to eat.
3. ____ Being able to buy the latest or best fashions.
4. ____ Knowing the landscape in which I live.
5. ____ Raising competent and successful children.
6. ____ Learning the skills and knowledge necessary to find and keep a good job.
7. ____ Being able to buy a cool or high status car or truck.
8. ____ Being able to buy the latest or best new technologies (e.g., cell phone, computer, ipod).
9. ____ Understanding how to find and access the services of any store or business I need.
10. ____ Knowing how to preserve food for winter.
11. ____ Understanding the climate, seasons, and geography of the region I live in.
12. ____ Having a network of friends and/or family I enjoy.
13. ____ Being able to give back to the land that provides for me.
14. ____ Making enough money to be able to buy new things regularly.

Appendix 5: Second Round Demographics

BACKGROUND INFORMATION:

1. Sex: Male _____ Female _____ Other _____
2. Age: _____
3. How many hours do you think you spend outside in an average week? _____
4. How many hours do you think you spend watching TV in an average week? _____
5. How many hours do you think you spend playing video games in an average week? _____

6. Please rate the following questions in terms how much you were involved in different parts of your community's gardening project. Use the scale below to respond to each question using a number.

0	1	2	3	4
Never	Rarely	Sometimes	Often	Almost Every Day

- _____ 1) Worked in the large Community Garden
- _____ 2) Cared for a small Garden Box in your yard or within the community
- _____ 3) Harvested vegetables from one of the Gardens
- _____ 4) Ate vegetables from one of the Gardens
- _____ 5) Attended the traditional teachings week
- _____ 6) Attended the Ginoogaming Powwow
- _____ 7) Noticed others working in the garden

7. Did you work as a Summer Student over the summer? _____ Yes _____ No
8. Did you work as a Research Assistant this summer? _____ Yes _____ No

Appendix 6: Debriefing Form

Mirella Stroink
Department of Psychology
Phone: (807) 346-7874
Office: SN 1017
mstroink@lakeheadu.ca

Graham Trull
Lakehead University
Phone: 343-8367 (Lab)
Email: gtrull@lakeheadu.ca

Dear Participant:

Thank you for your participation in this study. You have been entered in a draw for prizes that will take place this September. Your answers to the questions will help us to better understand how people identify with nature and with their community.

You answered many questions about yourself, the way you understand nature, your emotions, and how connected you feel to different communities. Connection to nature and sense of community sometimes tell us important things about the emotions that a person is likely to have. Our study is trying to find out more about these emotions and why nature and community are so important. Knowing more about this can help people to design programs that might improve your community and others like it.

This second round of the survey was designed to be almost identical to the first round. The answers from this second round will be compared to the first round to see if people's answers changed over the summer. We are particularly interested to see if those who participated in gardening in the community changed their answers because of their experience. After the study is completed, information will be given to your community explaining the results that we found.

If you have any questions or concerns about the study, please feel free to contact myself or Dr. Stroink at the e-mail addresses or phone numbers indicated above. Concerns about the research can also be taken to the Lakehead University Research Ethics Committee at (807) 343-8283. Please contact us if you want to be given more information about our research, or a summary of the findings from this study.

Thank you very much for your help with the study,

Graham Trull
Psychology Graduate Student,
Lakehead University