Cultural Continuity and Communities and Well-Being

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Abstract

This paper describes a household survey of Inuit in northern Alaska and how the survey data were used to better understand the relative importance of jobs, wild food harvesting, and social ties for life satisfaction. It emphasizes the importance of non-material measures for life satisfaction. It builds on other research showing the importance of harvesting wild food and the persistence of a mixed economy—one that combines cash income and wild food harvests. An empirical model estimates the relationship between people's choices to work, and/or hunt and fish, and individual satisfaction with life. The model includes economic and non-economic measures of well-being as well as community characteristics and shows that what matters most for satisfaction are family ties, social support and opportunities to do things with other people. Jobs, income, housing, and modern amenities—are less important among arctic Inuit. This research addresses the purpose for the original survey project—to give a more realistic picture of life in the Arctic by showing why people who live in remote, isolated, communities, with low incomes, and substandard housing are very satisfied with their lives. It also contributes to public policy in remote regions and efforts to understand how people are adapting in a rapidly changing environment.

Keywords: Alaska Natives, subsistence, well-being

1.0 Introduction

The study population is Inuit (Iñupiat and Yupiit, and Siberian Yupiit) who live in remote communities in the far north and northwest of Alaska (see Figure 1). Three regional centers provide government, transportation, and health services for villages in the regions. At the time of the study, the average population of a regional center was about 3,500—surrounding villages ranged from 100 to 700 people. Alaska Natives make up about 95% of the population in villages and about 75% in hub communities (Alaska Department of Labor and Workforce Development, 2010). Communities in the study area are located on the coast or along major rivers. None of the communities are connected by roads and rely on scheduled and unscheduled air service by single engine aircraft. In the winter, some villages are linked to regional centers by ice roads constructed on frozen rivers.

Figure 1. Map of the Study Region

> It can be said, though, that culture is an essential weapon against the chaos of life and death. It is a means by which continuity from generation to generation can be ensured, and an endorsement of order and meaning. Though the lifeways of present-day Alaska Natives still resonate with the unique cultures of their forebears, social chaos permeates their lives. A sense of order and meaning, to a large degree, has been misplaced (Alaska Native Commission, 1994).

Scientists and policy makers are interested in how aboriginal people who live in remote isolated places have adapted to rapid cultural, economic, institutional, and environmental change. "The changes that occurred in Native cultures came, in large measure, suddenly. In time, as measured by the development of intricate cultures and world views, the changes were almost, in fact, instantaneous." (Alaska Natives Commission, 1994). Change included the new forms of government, schools, laws and regulations, courts, and prisons that came following Alaska statehood in 1959, and large scale industrial development that began with the discovery of oil at Prudhoe Bay nine years later. With statehood and oil discovery came jobs and cash. Store bought foods became part of household diets. Also in the 1960s, the federal welfare system destabilized traditional gender based roles by providing income to mothers and their dependent children. Boarding school programs intended to 'Christianize' and civilize Alaska Natives (Darnell & Hoem, 1996) sent children away during the time in their life when they would have been acquiring hunting and fishing skills.

With statehood came tension between state and federal governments over community administration. Federally recognized tribal councils and Indian Refom Act (IRA) governments were in existence prior to statehood. Alaska has 226 recognized tribes. The federal government recognizes tribal sovereignty and tribes can compact and receive funding directly from the federal government (Fischer, Morehouse, Cornell, Taylor, & Grant, 1999; Morehouse, 1987). Because tribes do not provide services to non-Natives, and Alaska is "one country, one people" tribal sovereignty is problematic for the state. Until recently, the state did not recognize tribal sovereignty and at one point the attorney general suggested that tribes relinquish sovereignty in order for communities to receive state funds (Fischer et al., 1999) In order to administer state services, most of the communities became incorporated as cities, with city government positions and responsibilities. In places where there are only a few hundred people, this puts on strain on leadership and resources.

Job opportunities and transfer programs followed statehood and resource development. A cash economy was overlaid on subsistence hunting and fishing and a hybrid "mixed" economy emerged (Huskey, 1992; Huskey & Morehouse, 1992; Kruse, 1991; Usher 1992; Wolfe, Scott, Simeone, Utermohle, & Pete, 2009; Wolfe & Walker, 1987). Mixed economies have been shown to be persistent over time and characteristic of aboriginal communities around the Arctic (Furgal & Seguine, 2006; Kruse, 1991; Kruse et al., 2009). Aboriginal people have used earnings to increase their material well-being while maintaining hunting, fishing and harvesting activities (Kruse, 1991). The highest subsistence producing households also report high wage earnings (Kirkvliet & Nebesky, 1997; Kruse 1991). High producing households provide for other households in the community through customary sharing.

Earnings and wild food harvesting have become interdependent. Employment has become necessary for hunting and fishing (Berman, 1998; Huskey, 1992; Kirkvliet et al., 1997; Kruse, 1991; Usher, 1992). Aboriginal people have incorporated rifles, snow machines, freezers, and other technology to continue to hunt and fish while taking advantage of community based employment and public services (Helander-Renvall, 2008). Employment provides money for snow machines, fuel, rifles, and ammunition. People can now live in villages near jobs and schools, and hunt and fish on the weekends or in their spare time (Berman, 1998).

Wage employment in the villages is mostly in the public sector. Every village has a school, a tribal office, city office, and a health clinic which together account for most of the employment. Teaching jobs are held by non-Native immigrants; most stay for only a short time. Teacher turnover is about 22% per year, and even higher (33%) among first year teachers (Hirshberg & Hill, 2006). Hunting, fishing, and harvesting provide a large portion of food and include whales, walrus, seals, caribou, moose, eggs, fish, and plants. On average about 650 pounds of wild food per person is harvested in each community. In whaling communities, the total was nearly 900 pounds per person. Wild food harvesting and processing is termed 'subsistence' and is essential for cultural continuity. It is defined as,

> …activities that require special skills and a complex understanding of the local environment that enables people to live directly from the land. It also involves cultural values and attitudes: mutual respect, sharing, resourcefulness, and an understanding that is both conscious and mystical

> of the intricate interrelationships that link humans, animals, and the environment (Alaska Natives Commission, 1994).
>
> Subsistence is more than just gathering or harvesting of food. Subsistence is not sport. Subsistence is what provides for our cultural, spiritual and nutritional health. It is the sustenance of our cultures. It gives you a perspective that you are part and parcel of the ecosystem, that you are participating in the events of nature (Johnson, 2002).

"Subsistence has value beyond the food it produces. It is more than economics. It is the well-being of the community." (Mary Pete, quoted in *The Juneau Empire* Juneau: 11/16/1999). It is essential to Native ways of life, essential for cultural survival (Alaska Natives Commission, 1994; Morehouse & Holleman, 1994). Working with communities on studies of sustainability, Kofinas and Braund (1999) identified "continued subsistence hunting as a way of life, cultural continuity, and time on the land" as important goals for communities. Hunting and fishing also keep people from migrating to other places for employment because land rights, knowledge of the land, how to navigate, hunting crews, and sharing networks are place specific (Huskey, 1992).

Subsistence preparation, hunting, processing, and sharing connects Alaska Inuit households to other households and to extended families in other places (Magdanz, Utermohle, & Wolfe, 2002; Sumida, 1988; Usher, 1992). "Socio-economic functioning of Iñupiat households is seldom accomplished by a single households … households often form social networks to maintain their socio-economic welfare" (Craver, 2001). Wild food harvesting involves extended family groups (Huskey, 1992). Sharing among households is not limited to harvests. It also involves equipment for hunting and fishing, cash, and market goods (Berman, 1998; Magdanz et al., 2002).

Both jobs and subsistence are important for cultural continuity and well-being. The research questions in this study are: How do jobs and subsistence participation affect satisfaction? What are the other determinants of life satisfaction? And, how do communities affect life satisfaction?

The next section describes the Survey of Living Conditions in the Arctic, which is the main data source, community level data, and the estimation methods. It is followed in Section 3 by findings and the final section that discusses results.

2.0 Methods

2.1 Data

Data for this research come from the Survey of Living Conditions in the Arctic (SLiCA). The Alaska materials used in this research are part of a larger international survey project covering aboriginal people in seven countries around the Arctic—US (Alaska), Canada, Greenland, Sweden, Norway, Finland, and Russia. The initiative for the survey came from the Greenland Home Rule Government, Statistics Greenland. In 1994, Statistics Greenland conducted a Survey of Living Conditions in Greenland, using income, education, and housing to measure living conditions. The data showed that people living in remote

settlements had low incomes, high costs of living, and poor housing conditions, relative to European populations. Analysis of the data caused researchers in Greenland to re-examine their theoretical assumptions because their measures failed to capture important elements of Inuit life in the Arctic. They decided that measurement of living conditions had to be designed specifically for Arctic regions. They also concluded that it is more important to draw comparisons between Greenland and other Arctic regions than between Greenland and European countries ("Survey of living conditions in the Artic", n.d.).

In 1997, Statistics Greenland approached the Institute of Social and Economic Research (ISER) at the University of Alaska, Anchorage to ask if they were interested in a project comparing living conditions around the Arctic. In turn, ISER contacted Native representatives from the North Slope, Northwest Arctic, and Bering Straits regions to see if they were interested in participating in the project. These initial meetings were the basis for establishing an Alaska Native Management Board. The board has members from each of the three regions, the Alaska Native Science Commission, and international representation from the Inuit Circumpolar Conference. The Alaska Native Management Board was responsible for reviewing and approving the questionnaire, survey procedures, review of results by local communities, and procedures for publication of results by other researchers.

The survey design builds on work in behavior choice, social indicators, and subjective quality of life. It collected both objective measures and subjective assessments of well-being, expanding measurement of living conditions from income, education, and housing measures to cover social relationships, mental and physical health, and cultural practices. Because living conditions extend beyond material well-being, the survey also measured traditional and formal education, mental and physical health, ethnic identity, political participation, spirituality. SLiCA also collected information on subjective well-being—people's satisfaction with their lives as a whole and in multiple dimensions such as opportunities to hunt and fish, the prices of goods in local stores, and their housing.

The resulting survey was the first to allow comparison of living conditions of indigenous people with similar cultures around the Arctic. The Alaska portion of the survey includes information on approximately 3,000 individuals from 663 randomly selected households. Other papers (Andersen, Kruse, & Poppel, 2002; Hanna, 2004; Martin, 2005; Kruse et al., 2009) provide detail on survey implementation.

Community level data come from a variety of sources including US Census, Alaska Department of Fish and Game Subsistence Division, and Alaska Vital Statistics. Based on other research, the study identifies 15 variables hypothesized to affect jobs, hunting/fishing or life satisfaction. Principal components analysis created indices, grouped similar variables, and reduced the number of community variables from 15 to 4. Two other community variables were added. The first distinguishes between employment opportunities in regional centers and in villages. The second is a dummy variable for regional centers which accounts for additional differences between villages and regional centers that are not measured in the data. Factor one describes remote, low income communities, with a high proportion of Alaska Natives, and high levels of out-migration. The second factor describes long-inhabited, whaling communities with little out-migration, and large cohorts of younger people. Factor three describes fast growing communities with an influx of non-Native people who hold the high paying jobs. The fourth factor describes communities where there is a surplus of Native males.

2.2 Modeling Subsistence, Jobs, and Well-Being

Figure 2 presents the conceptual model developed for this research. The goal of the research is to understand how people combine jobs and subsistence and if the combination affects their satisfaction with life as a whole. Individual characteristics that affect employment, subsistence participation, and life satisfaction are age, gender, marital status, education, health, and traditional skills. Household characteristics are household size, composition, and traditional practices. Ties to extended family and social support are also important for employment, subsistence participation and life satisfaction. Characteristics of communities also matter.

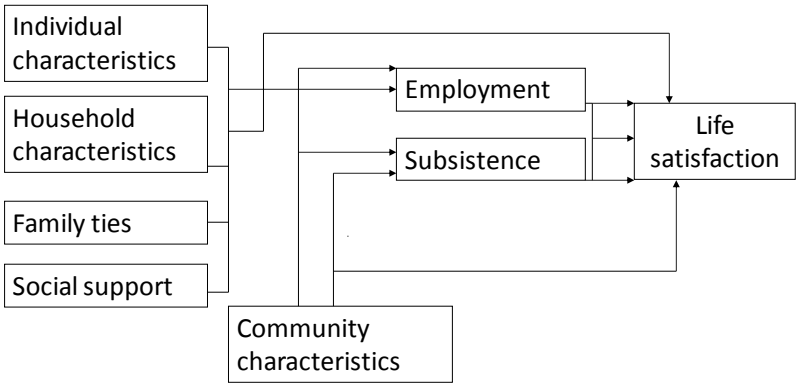

Figure 2. Conceptual Model of the Determinants of Life Satisfaction

Three equations operationalize the conceptual model. Dependent variables are individual employment, subsistence participation, and life satisfaction. The first two equations model individual employment and subsistence participation. Fitted values from these equations enter into a third estimating satisfaction. Life satisfaction is modeled as a function of the probability that a person is employed, estimated subsistence participation, and their interaction, as well as individual, household, family ties, social support, and community characteristics.

The three equation model is:

$$\text{Employment} = \alpha + \gamma_{11}X_{1t} + ... + \gamma_{1K}X_{Kt} + \upsilon_{1t}$$

$$\text{Subsistence} = \alpha + \gamma_{21}X_{1t} + ... + \gamma_{2K}X_{Kt} + \upsilon_{2t}$$

$$\text{Satisfaction} = \alpha + \beta_{31}\text{job} + \beta_{32}\text{harvesting} + \beta_{33}(\text{job*harvesting}) + \gamma_{3K4}X_{3Kt} + \upsilon_{3}$$

Where, employment and subsistence are endogenous variables (Kennedy, 1996),

$X_1, X_2, \ldots X_k$ are predetermined variables,
γ's are the coefficients of predetermined variables,
υ_{1t}, υ_{2t} and υ_3 are disturbances,
t is the total number of observations,
β's are the coefficients of fitted values from the equations estimating employment and harvesting (notation from Gujarati, 1995).

A probit equation estimates the probability that the respondent is currently employed (1=yes). From the probit, the probability that a person is employed equals,

$$\Pr(y=1 \mid X) = \Phi X\beta$$

Where, y=1 if respondent worked in the past week, 0 otherwise;

Φ is the cumulative normal distribution function,

β is a vector of coefficients,

X is a vector of explanatory variables.

Because of the way the data are distributed, a censored regression is used to estimate subsistence participation. Censored models are used to analyze dependent variables that are unobserved below a bottom limit (left censored), above a top limit (right censored) or both (McDonald & Moffit, 1980). Twelve percent of all respondents reported no subsistence participation. The data distribution is shown in Figure 3.

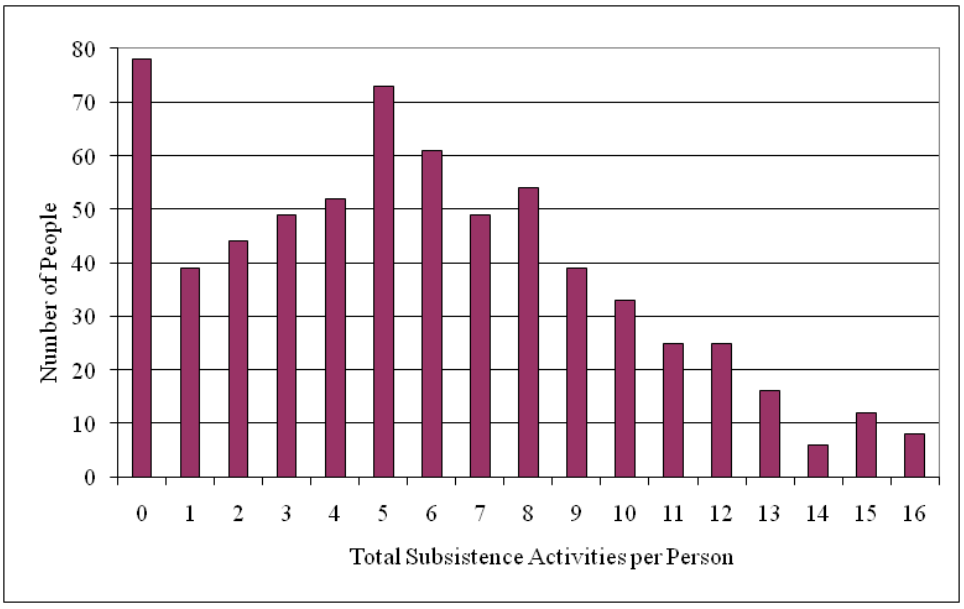

Figure 3. Count of Subsistence Activities

The final equation is an ordered probit estimating respondents' satisfaction with their lives. Table 1 shows responses to the question: How satisfied are you with your life as a whole?

Table 1. *Life Satisfaction*

	%
Very satisfied	54.8
Somewhat satisfied	34.0
Neither satisfied nor dissatisfied	7.6
Somewhat dissatisfied	2.8
Very dissatisfied	.8
n	641

A list of independent variables in each equation is presented in Table 2. Variables were chosen based on other findings from other research. Hamilton and Seyfrit (1994) found that, statewide, a higher proportion of Native women than Native men hold full-time jobs. Kruse (1991) found that men and women have different levels of subsistence participation and perform different subsistence activities, and higher levels of subsistence participation for married than unmarried people. Diener, Suh, Lucas, and Smith (1999) reported that other research found consistently higher levels of subjective well-being for married than for unmarried people. Iñupiat people maintain that subsistence foods are nutritionally superior to store-bought foods. They believe that native foods provide protection from cold and hunger (Kruse et al., 1983). In recent years, however, concerns have arisen about contaminants in native foods. Contaminants come from local mines, military, and oil development sites as well as from industrial sites outside of the US and are transported through the atmosphere (Wolfe & Utermohle, 2000). There are several on-going projects monitoring the effects of contaminants in subsistence foods on Native health. Reporting on other research on subjective well-being, Diener et al. (1999) wrote that self-reported health is strongly correlated with subjective well-being.

Table 2. *Variables included in estimation models*

Variable name	Variable label	Individual employment		Subsistence participation		Overall satisfaction
		Regional Centers	Villages	Men	Women	
AGE	Age	x	x	x	x	x
AGE^2	Age squared	x	x	x	x	x
RMARRY	Marital status	x	x	x	x	x
EDUC	Education level	x	x	x	x	x
RWOMAN	Female	x	x			x
BOARDING	Attended boarding school	x	x	x	x	x
SKILLS	Skills learned as a child	x	x	x	x	
HEALTHFITTED	Health fitted values	x	x	x	x	x
HOMELANG	Native language spoken at home	x	x	x	x	x
LIVEHERE	Live in community whole life	x	x	x	x	x
ADULTM	Adult males in household	x	x	x	x	
ADULTF	Adult females in household	x	x	x	x	
NONNATIVES	Non-Natives in household	x	x	x	x	
U16KIDS	Children under 16 in household	x	x	x	x	
LONEFEMALE	Lone female	x			x	
LONEMALE	Lone male	x	x	x		x
ELDERHH	Elder household	x	x	x	x	x
COUPLEK	Couple with children household	x	x	x	x	x
MULTIGEN	Multigenerational household	x	x	x	x	x
SINGLPAR	Single parent household	x	x	x	x	x
FAMTIES	Strength of family ties	x	x	x	x	x
SOCSUP1	Social support	x	x	x	x	x
PERSROOM	Housing conditions persons per room					x
REGCENTER	Regional center			x	x	x
EMPNRT00	Jobs per Native share working age pop	x	x	x	x	x
REMOTE	Remote, low income, support alcohol control		x	x	x	x
OLDWHALING	Old whaling communities		x	x	x	x
EMPPOPHSA	Pop & job growth, homicide, suicide, accidents		x	x	x	x
NATSEXRAT	High Native sex ratio		x	x	x	x
PJOB	Individual employment fitted values					x
PJOB_SUBFIT	Interaction fitted values employment & subsistence					x
SUBFITTED	Subsistence participation fitted values					x

2.0 FindingsTable 3 shows subsistence participation. Nearly 75% reported fishing. Activities requiring highly specialized skills and knowledge reported lower participation rates.

Table 3. *Percentage Reporting Subsistence Participation in the Past 12 Months*

Activity	%
Fish	74.7
Preserve meat or fish	70.8
Pick berries	69.1
Butchered caribou	52.6
Gather greens, roots or other plants	49.8
Hunt caribou, moose or sheep	46.0
Hunt waterfowl	36.3
Hunt seal	35.1
Make Native handicrafts	34.5
Help whaling crews	33.5
Gather eggs	31.0
Sew skins, make parkas	25.5
Member of whaling crew	22.4
Make sleds or boats	19.9
Hunt walrus	17.3
Trap	9.6

Table 4 presents descriptive statistics for individual and household level data used in the models. Data come from SLiCA. Variables in the table include indices of: skills learned as a child, family ties, and social support. Skills learned as a child is a count of twenty traditional skills the respondent was taught. The traditional activities are: serve on a whaling crew; hunt fish and hunt seal; read the weather; overnight on the land; name the different types of snow in Iñupiaq; skin and butcher a caribou; preserve meat and fish; take care of and sew skins; make sleds or boats; cook and prepare traditional Native foods; know when the berries are ripe and where to find them; know the names of past generations of Iñupiat relatives; make traditional clothing; learn stories passed on by your parents and grandparents; make Native arts and crafts; know traditional dances and drumming, navigate at sea; drive a snow machine; and fix a snow machine. Family ties is a count of responses to three questions about family: (1) “How strong are the links among family members not living with you?” (2) “During the last month, how often were you in touch with members of your family not living with you by phone or mail?” (3) “During the last month, how often were you in contact with family members not living with you by visiting or being visited?” For the first question, response categories are: 1=very weak, 2=weak, 3=neither weak nor strong, 4=strong and 5=very strong. For the last two questions, response categories are: 1=never, 2=once, 3=a few times, 4=more than a few times, 5=every day. The social support index is a count of responses to a series of questions about the kinds of support available to people when they need it: (1) someone you can count on to listen to you when you need to talk; (2) someone you can count on when you need advice; (3) someone who shows you love and affection; (4) someone to have a good time with; (5) someone to confide in or talk about yourself and your problems; (6) someone to get together with for relaxation; (7) someone to do something enjoyable with. Response categories are: 1=not at all, 2=very seldom, 3=some of the time, 4=most of the time and 5=all the time.

Table 4. *Descriptive Statistics of Model Variables*

			%	Mean
Individual	AGE	Respondent age		42
	RMARRY	Respondent married	40.8%	
	EDUC	Less than high school diploma	29.9%	
		High school diploma or equivalent	46.0%	
		Some post-secondary	21.6%	
		College degree or above	2.4%	
	RWOMAN	Female respondent	55.0%	
	BOARDING	Attended boarding school elementary or high school	30.3%	
	SKILLS	Number of traditional skills learned as a child		11.4
	HEALTH	Health is good, very good, or excellent	79.8%	
	LIVEHERE	Lived in community entire life	29.4%	
	FAMTIES	Family ties index		11.9
	SOCSUP1	Social support index		28.1
Household	HOMELANG	Native language spoken at home most or all the time	29.9%	
	ADULTM	More than 1 adult male	41.0%	
	ADULTF	More than 1 adult female	30.0%	
	NONNATIVES	One or more non-Natives	8.0%	
	U16KIDS	Children under 16		1.7
	LONEFEMALE	Lone working age female	6.0%	
	LONEMALE	Lone working age male	2.0%	
	ELDERHH	Elders with or without grandchildren	9.0%	
	COUPLEK	Couples with all children under 12	50.0%	
	MULTIGEN	Three or more generations in household	10.0%	
	SINGLPAR	Single parent with children under 12	7.0%	
	PERSROOM	Persons per room		1.5

Data from the Survey of Living Conditions in the Arctic (SLiCA) show high unemployment in the region. About half of the working age population was unemployed (not working for wages or salary in the week prior to the survey). In regional centers about 33% of the working age population was not working in a paid job. In villages, close to 65% were not working. Survey data also show the interdependence of earnings and subsistence. Correlation of household earnings and subsistence activities shows that people who live in higher income households do more subsistence activities ($r=.109$, $p=.005$). Survey data also indicate that access to cash allows people to buy better equipment. More income households purchased a truck, snow machine, 4-wheeler, or boat in the past 12 months ($r=0.204$, $p=<.0001$).

Table 5 shows the results from the probit equation estimating employment. Because the probit is a non-linear equation, the coefficients do not measure change in the probability of employment per unit change in the independent variables. The magnitude of the effect of each independent variable depends on values of the other independent variables. Results show that in villages and regional centers, age and education are the strongest determinants of employment. In regional centers, people with children under the age of 16 are less likely to be employed. People who live in households with non-Natives are more likely to be employed. High levels of social support are associated with employment. Social support can provide job networks, child-care. In villages, men living alone may be hunting instead of working. This supports Magdanz et al. (2002) finding that lone male

households in villages have high subsistence harvest levels. Another explanation is many men work during the summer in construction and firefighting jobs. They were not working in the winter, when the survey took place.

The probability of employment varies with community characteristics. Employment opportunities in a community affect the probability that a person has a job. The effect of employment opportunities in a community on the probability that a person has a job is opposite in regional centers and villages. In regional centers, more employment opportunities relative to the number of working age Alaska Natives, means that Natives are less likely to be employed. In regional centers, Natives may be less likely to work because there are more non-Natives immigrating for employment. In villages, the reverse is true.

Table 5. *Results From Probit Equation Estimating Employment*

	Individual employment			
	Regional centers		Villages	
Intercept	-5.07		-4.54	
AGE	0.14	**	0.11	**
AGE^2	0.00	**	0.00	**
RMARRY	-0.20		0.06	
EDUC	0.44	**	0.41	**
RWOMAN	-0.11		-0.13	
BOARDING	-0.12		0.29	
SKILLS	0.01		-0.01	
HEALTHFITTED	0.07		-0.24	
HOMELANG	-0.10		-0.03	
LIVEHERE	0.18		0.11	
U16KIDS	-0.15	**	0.01	
ADULTM	-0.10		0.03	
ADULTF	0.22		0.07	
NONNATIVES	0.35	*	0.17	
ELDERS	-0.12		0.80	*
LONEFEMALE	0.25		0.07	
LONEMALE	1.35	**	-0.80	*
ELDERHH	1.37	**	0.43	
COUPLEK	0.64	**	-0.33	
MULTIGEN	0.60		-0.53	
SINGLPAR	0.58		0.26	
FAMTIES	0.01		0.09	*
SOCSUP1	0.06	**	-0.02	
REGCENTER				
EMPNRT00	-1.20	*	1.69	*
REMOTE			0.76	
OLDWHALING			0.18	
EMPPOPHSA			0.11	
NATSEXRAT			-0.02	
Scale				
observations	335		289	
log likelihood	-155.9525		-164.319	
*p≤ 0.10				
**p≤ 0.05				

Figure 4 shows men do more whaling, hunting and trapping. Women do more gathering and processing, sewing and handicrafts. Because women do more processing work, their participation depends on successful harvests, and men's activities. Separate models estimate men's and women's participation because their roles in subsistence are different.

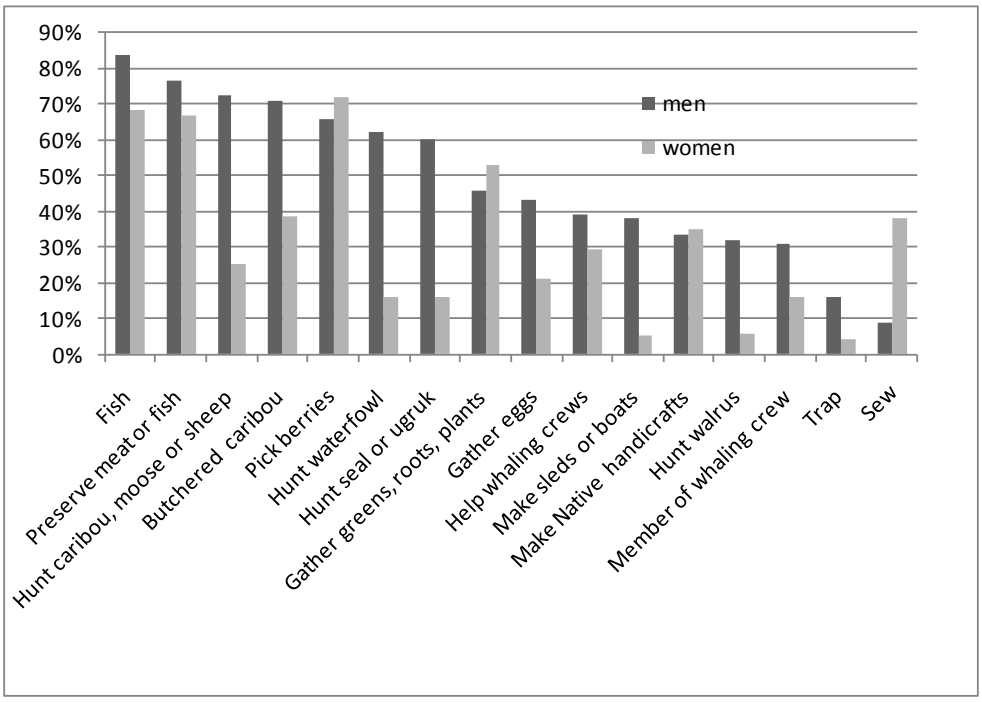

Figure 4. Subsistence Participation of Men and Women

Table 6 shows results of the censored regression estimating participation in hunting, fishing and harvesting. Results show that household and community variables affect men's and women's subsistence participation differently. Having more adult males in the household decreases men's participation, but it increases women's participation. Women traditionally skin and prepare meat, and if more men are hunting, there is more work for women. For men, living in households where Iñupiaq or Yupik language is spoken means higher levels of wild food harvesting participation. For both men and women, closer family ties are associated with higher levels of wild food harvesting participation. This confirms findings of other research about the importance of extended family networks (Magdanz et al., 2002; Usher; 1992). Some people work and provide cash for fuel and ammunition, and equipment, so that others can harvest wild foods. The results indicate that community characteristics are important for subsistence. Population growth and high crime rates mean subsistence participation is lower for both men and women. This may be because more people have diminished wildlife populations. There may also be more opportunities to work and buy store bought food. The underlying causes of homicides, suicides and accidental deaths could also be affecting subsistence participation. Subsistence participation levels are also lower for men and women in remote communities. Fuel, groceries, and ammunition are more expensive in remote place. Higher cost of living may mean

that people may lack the cash needed to buy fuel, snow machines, rifles or ammunition necessary for wild food harvesting. Job opportunities lower women's subsistence participation, but do not significantly affect men's participation. Where there are jobs, women choose wage work over subsistence. Men continue to hunt and fish. In places with high female out-migration, men do fewer subsistence activities. Men's lower subsistence participation may be because there are not enough women to assist with processing harvests.

Table 6. *Results of Censored Regression Estimating Subsistence Participation*

	Subsistence participation			
	Men		Women	
Intercept	-1.54		-4.86	
AGE	0.09		0.19	**
AGE^2	-0.002	**	-0.002	**
RMARRY	1.13	*	1.25	**
EDUC	0.36		0.11	
RWOMAN				
BOARDING	0.24		0.10	
SKILLS	0.53	**	0.42	**
HEALTHFITTED	0.31		0.12	
HOMELANG	0.64	**	-0.01	
LIVEHERE	-0.31		-0.31	
U16KIDS	0.22		-0.14	
ADULTM	-1.06	**	0.49	*
ADULTF	-0.58		0.34	
NONNATIVES	0.33		-0.27	
ELDERS	-0.07		-0.22	
LONEFEMALE			-1.34	
LONEMALE	-3.59	**		
ELDERHH	-1.90		-0.33	
COUPLEK	-1.82	**	-0.64	
MULTIGEN	0.65		-0.19	
SINGLPAR	-1.10		-0.76	
FAMTIES	0.25	**	0.25	*
SOCSUP1	-0.01		0.04	
REGCENTER	-4.42	**	-2.43	**
EMPNRT00	-0.12		-4.07	*
REMOTE	-1.40	*	-1.50	**
OLDWHALING	-0.07		-0.42	**
EMPPOPHSA	-1.02	**	-0.56	**
NATSEXRAT	-0.42	**	-0.14	
Scale	3.10		2.70	
observations	244		372	
log likelihood	-641.89		-819.9	
*p≤ 0.10				
**p≤ 0.05				

Table 7 shows results from the ordered probit regression estimating satisfaction with life as a whole. The table shows that health, extended family ties, social support, and living in a long-inhabited whaling community increase satisfaction with life as a whole. Findings do not support the idea that either employment or

subsistence participation increases life satisfaction. Family ties, and social support are strong predictors of satisfaction. Since subsistence involves more than one person, and food is shared among households, subsistence is part of these measures. These findings connect this research to others (Kofinas et al., 1999) who note the importance of spending time on the land, and with elders, and cultural continuity. After reviewing preliminary findings from this research, Patricia Cochran, Director of the Alaska Native Science Commission wrote:

> "In my opinion, the word 'wild food harvesting' as it's being applied, is too narrowly defined. Wild food harvesting is not a word that comes from the 'Native' vocabulary, which is one of the reasons we have such trouble with it. I look at wild food harvesting as a way of life or living, which includes all aspects of the Native way of being – respect for all living things, sharing, culture, training – the whole worldview. So, I would have to disagree with the conclusion that there is no significant relationship between wild food harvesting and satisfaction. I think it has everything to do with satisfaction." (Personal correspondence, October 21, 2004).

The results show that increased probability of employment is associated with lower levels of satisfaction with life as a whole. This is likely to be a controversial finding. Participation in the wage economy is important to Alaska Natives (Kofinas et al., 1999). People with jobs have less time for hunting and fishing, less time for activities with extended family and friends. In whaling communities, jobs may mean also having less time to help whaling crews prepare and harvest. Among the community variables, living in a long-inhabited whaling community is associated with higher levels of satisfaction with life as a whole. Bowhead whaling is an indicator of interdependence in a community. People lend equipment and supplies for hunts, help prepare for hunts, serve on a crew, land the whale, and cut, and transport meat back to the community (Kruse, 1982). The distribution of the whale harvest is a collective action. Huntington (1992) wrote, "The bowhead provides life, meaning, and identity to the Eskimo whalers and their communities. Sharing the whale with the whole community is an old and highly–valued practice". Whaling appears to be a socially binding force, generating and providing more than material benefits (Kruse, 1982). Rapid population and employment growth, and crime are indicators of rapid change at a community level, and have negative effects on subsistence participation.

Table 7. *Determinants of Satisfaction With Life as a Whole*

How satisfied are you with your life as a whole		
Very dissatisfied	-3.722	
Dissatisfied	-1.622	
Neither satisfied nor dissatisfied	-0.343	
Somewhat satisfied	1.231	
AGE	0.005	
AGE^2	0.000	
RMARRY	0.072	
EDUC	0.102	
RWOMAN	-0.252	
BOARDING	0.192	
HEALTHFITTED	0.335	**
HOMELANG	-0.013	
LIVEHERE	-0.093	
LONEMALE	-0.331	
LONEFEMALE	0.036	
ELDERHH	0.174	
COUPLEK	0.265	
MULTIGEN	-0.560	
SINGLPAR	0.387	
FAMTIES	0.130	**
SOCSUP1	0.066	**
PERSROOM	-0.026	
REGCENTER	0.093	
EMPNRT00	-0.844	
REMOTEDRY	0.128	
OLDWHALING	0.437	**
EMPPOPHSA	-0.191	
NATSEXRAT	-0.013	
PJOB	-1.749	**
PJOB_SUBFIT	0.045	
SUBFITTED	-0.011	
observations	621	
-2 log likelihood	1185.042	
*p≤ 0.10		
**p≤ 0.05		

4.0 Conclusions

Findings provide empirical support for the importance of subsistence as a way of life. People who live in remote, isolated, low income communities with few jobs and poor quality housing are indeed satisfied with their lives. It demonstrates empirically that cultural continuity provides a base for which Inuit can adapt to rapid change. It is important for understanding the effects of rapid change on people in the northern Alaska and may be relevant for other remote regions. The empirical analysis demonstrates the importance of participating in groups at the level of household, extended family, and informal networks, and community life is associated with employment, continued subsistence participation.

History also matters (Ostrom, 1990). Applying Ostrom's insights to this study leads to the conclusion that people who live in communities with a long history of reciprocity and working together, are better off because they have developed institutions to weather rapid change. Conventional wisdom is that life on the North Slope is better following the oil discovery because there are jobs and money. Following Ostrom, it is more likely that jobs and financial success have come to the North Slope Inuit because they have a long history of working together and been able to incorporate economic development into their culture.

This research supports policy recommendations of others (Wolfe et al., 2009), who write that the concentration of subsistence production among households has implications for wildlife management regulations: limits and quotas on individual hunters are not compatible with local patterns of hunting and sharing and the redistribution of food resources from high- to lower-income households. In addition, commercial and sport harvests put pressure on subsistence resources and disrupt hunting and sharing networks.

Findings from this research lead to conclusions similar to those of Berkes et al. (1995). The continued importance of subsistence practices and its importance for adapting to change means that aboriginal people need to be at the center of discussions and policy planning about the future of their regions.

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