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The impact of resource development on social ties

Theory and methods for assessment

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The concept of corporate social responsibility (CSR) matured in the context of debates over sustainable development, embedding the principle that current economic activities must not compromise environmental and social resources for future generations. While there are various contending theories of CSR, most of them recognise corporate responsibilities to the communities in which they operate, responsibilities to align their activities to some degree with the long-term interests of these communities.

Usually, providing local jobs with decent wages and working conditions is counted as a benefit to be weighed against whatever negative environmental or social impacts might accompany them. But, when the communities in question are indigenous, with predominantly non-market social and cultural systems, more complex trade-offs arise about the impact of jobs and wages on community well-being. Jobs and wages may have negative as well as positive social effects. In this chapter we address the question: How does resource development and the associated increase in the cash economy affect social relationships and well-being in indigenous communities rooted in traditional relations of subsistence production?

The chapter reviews empirical findings regarding social impacts of development in Arctic Alaska; develops a theoretical framework for understanding types of social ties,

changes in social ties and implications of changes in social ties; explores methodological strategies for measuring social ties; and concludes with a research design for measuring changes in social ties that may result from resource development in Arctic Alaska. It uses Woolcock's (1998) definitions of social capital at the micro level—intra-community ties and extra-community networks—and explores Granovetter's and Burt's ideas that 'weak ties' (i.e. acquaintances) that bridge network clusters may be more beneficial than 'strong ties' (i.e. friends and relatives) in a market economy context.

Well-being in Inupiat communities

The Survey of Living Conditions in the Arctic (SLiCA) (Poppel *et al.* 2007) collected data on well-being in a sample of 700 Inupiat and Yupiit households in the Bering Straits, Northwest and North Slope regions of Alaska. More than three-quarters of the residents are Inupiat (all three regions) or Yupiit (Bering Straits), living in three regional centres and 32 small villages. All the communities are remote, with no road access. The economy is a mix of wage employment and traditional subsistence hunting and gathering activities. The largest employer by far is government. Employment on the North Slope is fuelled by tax revenues from the oil and gas industry. The Northwest Arctic (NWA) is home to the Red Dog Mine, the world's largest zinc and lead mine and the second largest employer in the region. The Bering Straits region has no significant resource development or basic industry. All three regions are characterised by high unemployment and low household incomes.

Survey results show that, despite widespread (income) poverty, 90% of respondents are satisfied with their life as a whole. The primary factors predicting life satisfaction are:

- Family ties
- Social support networks
- Income and employment
- Subsistence activities
- Local control of resources

The biggest problem, cited by 83% of respondents, is unemployment; 42% have considered moving to another community, and the most frequently cited motive is better job opportunities. Yet 77% of households prefer to combine jobs with subsistence. Subsistence and social relationships are the most important reasons people choose to remain in small communities, despite the lower (cash-based) standard of living there (Poppel *et al.* 2007).

Alaskan Inupiat and Yupiit households tend to be closely connected to other households socially and spatially, thereby forming extended families (Magdanz and Utermohle 2002; Sumida 1988; Usher 1992). As Craver notes (2001: 19) 'the socio-economic functioning of Inupiat households is seldom accomplished by a single household'. Research throughout the Arctic has shown that participation in social networks and

sharing is associated with increased subsistence activity (Berman 1998; Craver 2001; Magdanz and Utermohle 2002; Usher 1992). Sharing of subsistence harvests is integral to traditional Inupiat values and social relationships. Subsistence activities are the medium for the reproduction of core Inupiat values and identity.

Ritchie and Gill (2004) analyse subsistence as a form of social capital. They have assembled a series of quotations from subsistence communities in Prince William Sound in south central Alaska to illustrate the social and cultural functions of subsistence activities. The interviews were conducted some years after the *Exxon Valdez* oil spill polluted 44,000 km² of the Gulf of Alaska waters and 1,900 km of shoreline. The impact on marine life and subsistence resources was devastating. These local voices explain that subsistence is about kinship and sharing, reciprocity, security, identity, reproduction of cultural values and skills, heritage, spirituality and social cohesion, as well as a unique lifestyle with its own rhythms and relationships with the natural world.

Subsistence is part of rural economy, but it has little or no relation to western views of economic value. Subsistence is about eating, but wild foods can't simple be replaced by a processed substitute. Subsistence is about kinship and social cohesion, but it is not a ritual or ceremony (Piper 1993: 107; see also Jorgensen 1990).

I hunted 19 days one year . . . I shot 21 deer and 20 of them were bucks . . . I hang [the meat], cut it, then deliver it to people all around town. I give it away. I know the limit's only 5 or whatever but . . . out of those 21 deer, I probably gave 11 of them away and only used what I needed (Ritchie and Gill 2004: 169-70).

It is during the cycles of subsistence that bonding is strengthened and expanded. The sense of worth is solidified and new skills are learned. It is during these bonding times that our individual value is placed within our community, and we are able to understand what we must do to preserve our lives and to live in harmony (Ott 1994: 47).

We could always fall back on the land, whatever happened. Whatever they [non-Natives] did . . . to us, you always have the land or sea . . . This is what you always have to fall back on. It is always there . . . You take care of it; it will take care of you . . . You identify with it. That is what you are (Ritchie and Gill 2004: 163).

We have . . . a different attachment to [the environment]. As long as it is there . . . life is going to be okay . . . You have the Father Sky and there is the Mother Earth. It is like she got damaged. It is not just economically you are going to get deprived, but psychologically . . . you have lost something too (Ritchie and Gill 2004: 164).

Social networks, associations, norms of reciprocity, social cohesion, and trust among family, extended kinships, friendships, and community are intrinsic in a subsistence lifestyle (Ritchie and Gill 2004: 23).

To summarise, subsistence serves a wide range of economic, social and cultural functions in Inupiat society, including: food and nutrition; economic production, consumption, cost of living and economic security; sharing, social ties and cultural identity; values and spiritual resilience; social capital in the form of reciprocity, trust, cooperation and leadership; and physical and mental health. Time on the land promotes obser-

vation-based knowledge, skills, experience and judgement; hunting provides a positive outlet and valued social role for young men; and self-reliance promotes a sense of efficacy and fate control.

Jobs and income are also important factors for well-being. Closer analysis, however, shows that the effects of employment and income on subjective well-being (SWB) are mixed. Consistent with the findings of Lane (2000), the benefits of increasing income are concentrated at the low end of the income distribution, with diminishing returns to well-being as income rises. SLiCA finds the threshold is around 60% of the median income; below that level, increasing income correlates with increasing SWB, but the correlation largely disappears above that amount (Poppel *et al.* 2007). And, while the raw correlation in SLiCA data between employment and SWB is positive, when Martin

FIGURE 2.1 Subsistence harvest-sharing network in an Inupiat village

‘Who caught, cut, & gave away the subsistence foods your household used?’

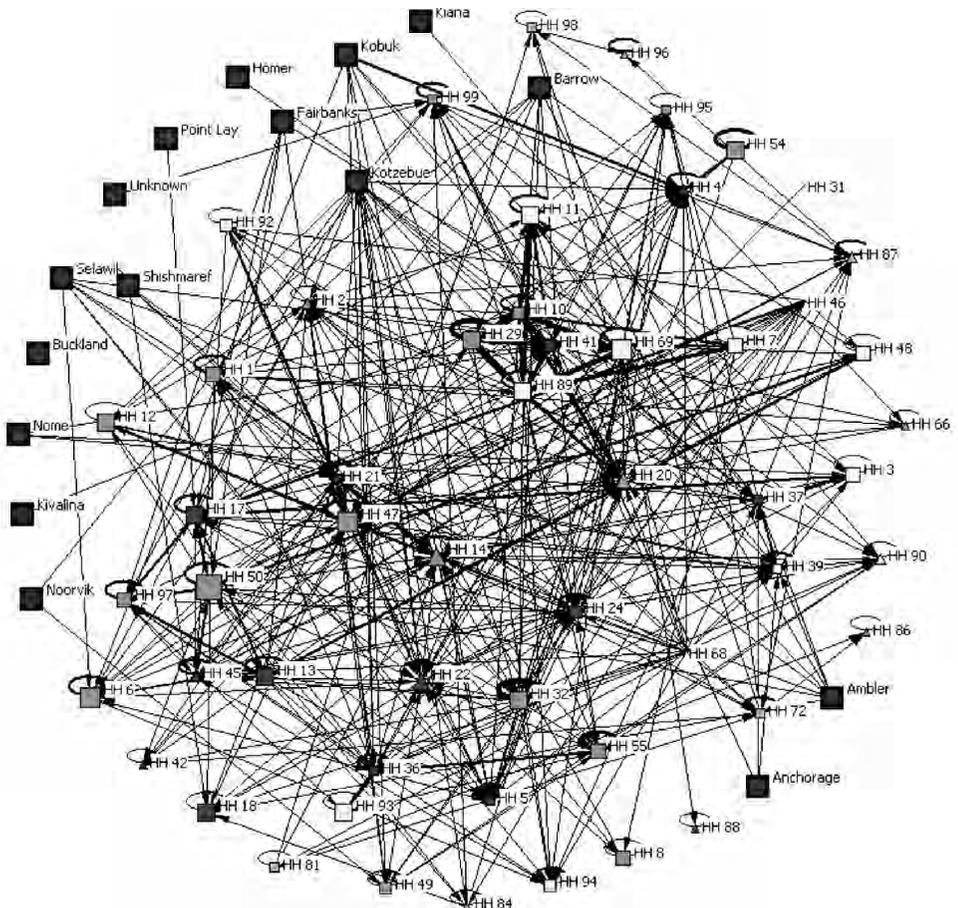
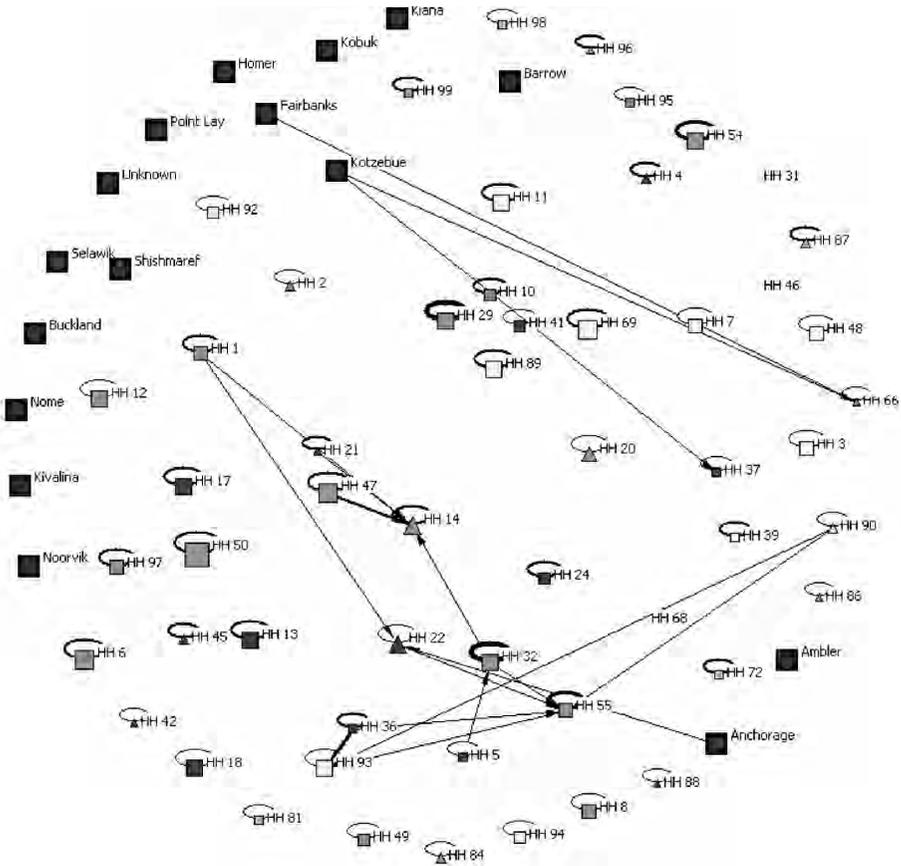


FIGURE 2.2 Cash-sharing network in an Inupiat village



(2005) introduced more control variables (using a three-equation ordered probit model to estimate the relationship between overall life satisfaction and the probability of employment, along with a range of personal and community variables) the relationship she finds is negative. ‘The negative relationship may be because jobs take time away from participating in family, social and community activities that are [more] important for satisfaction’ (Martin 2005: 142).

This tension between the cash and subsistence economy may be further illustrated with subsistence-sharing network data. Figure 2.1 shows the subsistence harvest-sharing network between households in one Inupiat village. The survey data set reports ‘Who caught, cut, & gave away the [subsistence resource] your household used?’ for more than 60 different species of fish, shell fish, marine mammals, large land mammals, small mammals, birds and bird eggs, and wild edible plants. It is visually dense. The measured density—that is, the number of ties expressed as a percentage of the number of ordered pairs within the community—is also high.

Similar network maps and indices can be constructed for other types of ties covered in the survey instrument, including information and advice about hunting, sharing hunting equipment, providing household labour (housework, childcare, cutting firewood, building or vehicle maintenance and repair), social support, financial ties, and, as a possible new addition to the subsistence survey instrument, information and advice about job search.

Figure 2.2 shows the cash-sharing network in the same community. In marked contrast to the subsistence economy, relationships in the cash economy are disintegrated. Even in Inupiat communities with strong ties, cash is not widely shared between households.

This dichotomy between strong, dense ties in the subsistence economy and weak, disintegrated ties in the market economy raises the question: What are the social effects of increasing integration in the cash economy?

Economic development, social capital and well-being

The social capital literature to date has primarily focused on how networks, norms and trust shape economic outcomes (Borgatti and Foster 2003; Granovetter 2005; Woolcock 1998). Here, however, we focus on the converse: how changes in economic activities change social relationships and values. We place this in a larger normative context: economic development per se is not the goal of human endeavour: the goal is human development and well-being. Economic activities and social relations are both means to this higher-order goal.

Human development and well-being are expanding arenas for academic and policy research. ‘Human development’ usually refers to aggregate indicators representing constituent components of human welfare, as in the United Nations Human Development Index, which combines measures of per capita income, life expectancy and education. The *Arctic Human Development Report* (AHDR 2004) expands on this to include fate control, cultural integrity and ties to nature, but stops short of defining or identifying indicators to measure these.

‘Well-being’ usually refers to individual-level measures, and the research generally focuses on identifying the underlying determinants of well-being. Subjective and objective measures of well-being are highly congruent (Helliwell 2005). Many studies have found that social relationships are a source of happiness (Myers and Diener 1995) and a factor predicting a range of life outcomes, including finding employment (O’Regan and Quigley 1996), socioeconomic status (Smith 1998) and health status (Larsen 1993).

Helliwell (2005) assesses the state of the science linking social capital to well-being. He finds that subjective well-being (SWB) rises with:

- Frequency of contact with family, friends and neighbours
- Neighbourhood norms of trust and trust in the public realm
- Mastery or command of personal or social circumstances, which is correlated with and amplified by education

- Job satisfaction and workplace trust, and
- Good government (effectiveness, efficiency, lack of corruption; voice, accountability and political stability), especially at the community level

So the linkage between social capital and human well-being is well established. But social capital is an amorphous concept. Woolcock (1998) reviewed the several classical and contemporary research traditions on social capital and proposed his own definitional synthesis. First, social capital is defined by structure (for example, ties), not effects (for example, trust). He then identifies and names four types of social capital. At the group or community (micro) level, 'integration' refers to the strength and density of internal relationships, while 'linkage' refers to the network of contacts outside the group. At the national or governmental level, 'integrity' means the competence and effectiveness of governmental institutions, while 'synergy' refers to the breadth and quality of relationships between the government and civil society. He argues that all four dimensions working in concert are key to economic development. Furthermore, social capital is dynamic, and the component forms and functions change as development progresses.

Granovetter (1973, 1983) distinguishes between 'weak ties' (i.e. acquaintances) and 'strong ties' (i.e. friends and relatives). Strong ties exhibit greater time, intensity, intimacy and reciprocal services. The networks of strong ties are also more dense, forming clusters of closely connected people. Weak ties tend to be more diverse and diffused, and therefore more far-reaching. 'Weak-tie' acquaintances are typified by co-workers, old school chums, and members of civic organisations. They provide access to information and resources beyond that available in one's own social circle. Strong ties are especially important in poor communities where mutual helping relationships, exchanging all manner of goods and services, provide a measure of economic security (see also Lomnitz 1977; Stack 1974).

Ties that bridge different social groups have particular value. Because of the transitive nature of strong ties—my relatives are also related to each other, and my friends tend to be friends with each other—weak ties are much more likely to bridge social differences than strong ties. Diverse sources of information are the key advantage of weak ties that bridge. 'Individuals with few weak ties will be deprived of information from distant parts of the social system and will be confined to the provincial news and views of their close friends' (Granovetter 1983: 202).

Granovetter (1983) elaborates on work by Coser (1975) to argue that bridging weak ties are associated with complex role sets and cognitive flexibility. People concentrated in strong-tie relationships have less opportunity to explore their roles in relation to the complexities of the outside world. On the other side, negotiating a wide variety of different viewpoints and activities requires intellectual flexibility and self-direction. Indeed, it is prerequisite to the social construction of individualism.

Bridging weak ties also have macrosocial effects. Without weak ties to link them, a society composed of closely knit groups will be fragmented and incoherent. 'Weak social ties extend beyond intimate circles and establish the intergroup connections on which macrosocial integration rests' (Blau 1974: 623, quoted in Granovetter 1983: 220). These links enable social movements, the wide diffusion of new ideas, and effective mobilisation for collective action (Granovetter 1983). Links between diverse constituent groups and political leaders improves information flow both ways, improves decision-making and increases the likelihood of civic engagement (Granovetter 1973).

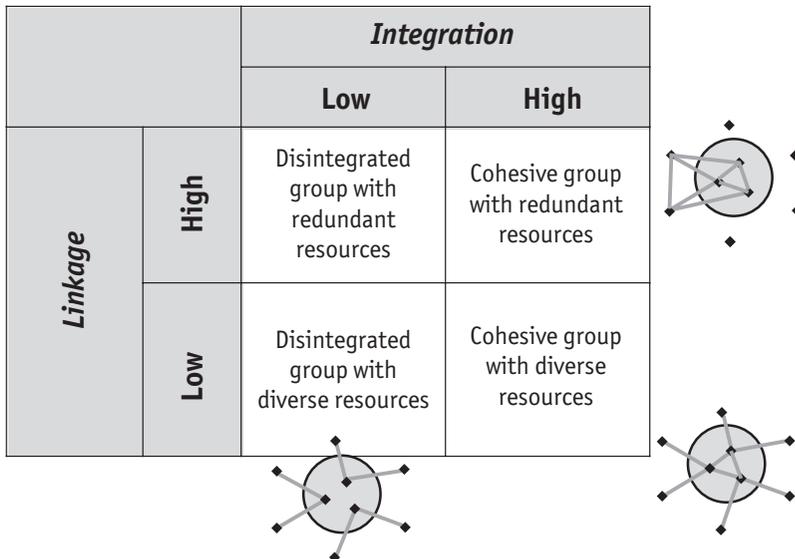
Putnam (2000) picks up on Granovetter’s distinction and explains the difference between ‘bonding social capital’ and ‘bridging social capital’:

Bonding social capital constitutes a kind of sociological superglue, whereas bridging social capital provides a sociological WD-40. Bonding social capital, by creating strong in-group loyalty, may also create strong out-group antagonism . . . nevertheless, under many circumstances both bridging and bonding social capital can have powerfully positive social effects (Putnam 2000: 23 quoted in Ritchie and Gill 2004).

Burt’s (2001) discussion of bridging versus closure in the topography of network ties provides a particularly useful model that integrates both forms of social capital in one framework. The elements in Burt’s model are essentially identical to Woolcock’s (1998) typology, and so we will take the liberty of using Woolcock’s terminology for them. Figure 2.3 illustrates the Burt–Woolcock synthesis. Internal cohesion enhances social capital because dense networks facilitate trust and shared norms by facilitating effective sanctions. External integration enhances social capital by increasing access to diverse information. Burt argues that groups with both forms of social capital have the highest performance:

Performance is highest [in the fourth quadrant] where in-group closure is high (one clear leader, or a dense network connecting people in the group) and there are many non-redundant contacts beyond the group (member networks into the surrounding organisation are rich in disconnected perspectives, skills and resources). Performance is lowest [in the first quadrant] where in-group closure is low (members spend their time bickering with one another about

FIGURE 2.3 Burt–Woolcock synthesis model of social capital



what to do and how to proceed) and there are few non-redundant contacts beyond the group (members are limited to similar perspectives, skills and resources) (Burt 2001: 41).

This thesis is empirically supported not only in the management literature discussed by Burt, but also in evaluation research in rural Alaska on the effectiveness of community initiatives to improve the operation of water and sanitation facilities:

Overall, we want to emphasise that strong community leadership, a broad base of support for improving utility management [cohesion], and cooperation among local officials and outside agencies [integration] are crucial to improving operation and maintenance of water and sewer systems in rural Alaska (Haley 2000: E-13).

These theories and empirical studies have been elaborated mostly in the context of urban communities in market economies. Social capital researchers typically measure levels of trust, organisational membership and societal participation to explain outcomes such as social cohesion, social solidarity and economic achievement (Ritchie and Gill 2004). The thesis about strong and weak ties has been explored mostly in relation to employment search, focusing on information and referral and expanded choice sets. The structural holes hypothesis has been tested in terms of individual and team performance in corporate environments. Woolcock (1998) reviews how social capital theory has been applied in studies of economic development, education, organisations, democracy and governance. But what concerns us here is the converse: how economic development restructures social relations.

The transition from traditional relations in a subsistence hunting and gathering society to market relations in a cash economy has significant implications for social capital and well-being. The traditional economy is based on household production and kinship-based sharing networks that create strong social ties and cultivate trust. The market economy is based on individual, wage labour and impersonal and often transient exchange relationships.

Lane (2000) and Layard (2005) analyse specific elements of market economies that erode SWB. Lane conducted an in-depth review and analysis of longitudinal and cross-national data on self-reported happiness and life satisfaction and data on depression. The striking finding he seeks to explain is a pervasive pattern of declines in well-being associated with increases in affluence in developed countries. The reason, he argues, is the corrosive effect of the market economy on social connectedness, through smaller and more fragmented families and greater geographic mobility as well as increasing materialism and consumerism. Layard finds that short-term commitments and linking monetary rewards to individual performance both corrode trust and loyalties and create unhappiness. Helliwell (2005) notes that SWB by age is U-shaped, with one-third of the mid-life decline in SWB explained by the stress of work–life balance.

Social ties and market integration: empirical evidence from SLiCA

The strong ties so abundantly manifest in the subsistence economy are the most important source of well-being reported in Inupiat communities (Kruse *et al.* 2007). But jobs and income are also important, and what the market economy does incomparably well is to improve material standards of living. Granovetter (1973, 1983) and Burt (2001) argue that bridging ties that link individuals or groups to diverse network resources may be more important for success in the market economy. Bridging ties have been shown to be more effective for diffusion of information, including activities such as job search, innovation or adaptation.

So what are the social effects of increasing integration in the cash economy? In terms of the Burt–Woolcock model we would expect community integration to decrease and linkage to increase. This and the foregoing discussion raise three sets of hypotheses:

1. Increases in market activities are associated with decreases in strong, dense ties and increases in weak, bridging ties
2. Decreases in strong, dense ties and increases in weak, bridging ties will:
 - Decrease trust, reciprocity and common values for the community
 - Decrease social support and well-being for the individual
 - Increase diversity of information resources and choices for the individual
3. Increases in income will, on average, yield no net increase in well-being for individuals:
 - Increases in well-being due to improved material standards of living, expanded opportunities and choice sets, and improved health will be offset by declines in family ties and social support

The first step in exploring these hypotheses is to mine existing data. The SLiCA includes information on approximately 3,000 individuals from 663 randomly selected households in the northern regions of Alaska. The survey collects both subjective assessments and objective measures of well-being, including income, education, housing, social relationships, mental and physical health and cultural practices.¹ Some of this analysis, as discussed above, has already been done by Martin (2005) and Kruse *et al.* (2007). The factors the authors found that explain overall life satisfaction include family ties, social support, personal income (at levels below 60% of median income only), working at least part of the year, subsistence activities, satisfaction with the amount of fish and game available locally, and satisfaction with the number of job opportunities in the community.

Here we are interested in how social capital varies with degree of market integration. For this we use three proxies for market integration: whether the survey respondent is employed full-time; the household income for the respondent; and whether the respondent lives in a village or a regional centre.

1 www.iser.uaa.alaska.edu/projects/Living_Conditions, accessed 15 August 2008.

In Arctic Alaska more than two-thirds of indigenous people live in villages with a population of less than 1,000. The villages have lower levels of market economic activity than the regional centres. The regional centres are hubs for regional commerce, offering more jobs, employment, income and a wider range of goods and services. They are also more socially and ethnically diverse.

The villages are more culturally homogeneous and more traditional than the regional centres. Some 87% of villagers report that both parents are Inupiat and only 13% have a non-Inupiat parent, while in the regional centres 26% report one parent is non-Inupiat. In the villages more than 30% of households include three or more generations, while in the regional centres households of three or more generations make up only 17% of households. Overall, 40% have lived in their community all their lives, and 60% have lived outside the community for a year or more. In the regional centres, 70% have lived outside the community for a year or more sometime in their life, while in the villages this drops to 55%. Interestingly, the Northwest Arctic (NWA) region has a much higher percentage than the other two regions: over 80% for the regional hub Kotzebue and 70% for the NWA villages. Kotzebue also leads the pack for the percentage of respondents (57%) who have considered moving away in the past five years, while NWA villagers are much more content to stay put, with only 34% having considered moving.

Overall, 61% learned Inupiat as a child, but, while 65% of villagers spoke with their parents at home in Inupiat, only 47% of respondents in the regional centre were spoken to in Inupiat by their parents when they were young. While 50% of the adults in the NWA villages speak Inupiat some or most of the time, only 26% of adults in Kotzebue do so. Over 90% of adults read, write, speak and understand English well; the percentage is higher in regional centres than in villages.

Respondents living in the regional centres report higher levels of formal education and employment. Seventy-one per cent of Inupiat adults have completed high school, with 44% completing some or all of it outside the community; 35% of adults in regional centres and 21% in villages have some college or vocational education beyond high school.

Among Inupiat adults 77% prefer a mix of wage employment and subsistence activities for their livelihood; 15% prefer paid work as their primary occupation, while 8% prefer a traditional subsistence lifestyle. Unsurprisingly, those who prefer wage employment are more likely to live in the regional centre, and are also more likely to be young: 26% of respondents aged 16–24 prefer working on a wage job. Eighty-seven per cent report being somewhat or very satisfied with the combination of activities they have.

Regarding traditional values, 78% of respondents are satisfied or very satisfied with their community's promotion of traditional values, with a smaller percentage in Kotzebue and Nome than in the villages; 92% of Alaska respondents apply traditional values in their personal life, and this does not vary between the regional centres and the villages (Poppel *et al.* 2007: tables 157 and 158) More than three-quarters of Inupiat adults are educated in traditional skills including hunting and fishing, preserving meat and fish, knowing when berries are ripe and where to find them, cooking and preparing traditional native foods, and over-nighting on the land. Knowledge of traditional skills is across the board more prevalent in villages than in regional centres, and skills are more likely to be used. Some 88% of respondents said children today are learning these skills, and there were no significant differences between villages and regional centres in perceptions of learning traditional skills.

People in Kotzebue follow politics more than villagers, with 51% compared to 42% considering themselves somewhat or very knowledgeable in this area. Yet the higher the proportion of non-natives living in the community, the less satisfied they feel with their control over environmental problems in their area. Perceived social problems, such as alcohol and drug abuse, sexual abuse and family violence, and suicide, are also consistently higher in regional centres than in villages.

We extend this description of survey findings with bivariate analysis of social characteristics by extent of market activity. Table 2.1 shows three sets of comparisons: villages versus regional centres; high-income versus low-income households; and whether or not the respondent is employed full-time. As we would expect, people in regional centres, those with higher household incomes, and those who are employed full-time are highly correlated and are also more likely to have high levels of educational attainment. Inupiat in communities of all sizes and income levels report strong family ties.

Yet the three domains reveal important differences. For example, high-income households enjoy more social support than low-income households. The difference in social support is weakly significant by community size, and disappears altogether by employment status.

For this analysis we constructed an indicator of strong ties, defined as frequency of contact with family not living in the household plus self-rated strength of family ties, and an index of bridging ties, defined as having a non-native parent or spouse, having parents born in another place, having lived for a year or more in another place (greatest weight), having been away for a month or more for work or education, and memberships of regional or state-level boards and organisations. Both measures range from 0 to 10. We find no difference in strong ties by size of community, by household income, or by employment status.

We do find significant differences in bridging ties exactly as expected. Bridging ties are higher in regional centres, higher in high-income households, and higher for those who are employed full-time. We checked the relationship between bridging ties and community size in a multivariate linear regression controlling for age, gender and full-time employment. Only age was significant, and, while the relationship to community size weakened slightly, it remained significant.

We constructed an index of variation in opinion, defined as the sum of the squared differences in the respondent's opinion compared to the mean opinion overall across 17 opinion questions in the survey. As expected, we find greater variation in opinion in regional centres and less variance in villages. There is no significant variance by income, but people employed full-time are somewhat more likely to hold deviant opinions than those with more tenuous ties to the labour market. We checked the relationship between opinion diversity and community size in a multivariate linear regression controlling for age and bridging ties: age was positively correlated with deviant opinions and bridging ties were insignificant. While the relationship with community size weakened slightly, it remained significant.

Lastly, we analysed the sources of Inupiat identity. The six most important are, ranked by their importance to village Inupiat: (1) eating traditional foods, (2) hunting, fishing, gathering and preserving traditional foods, (3) childhood upbringing, (4) naming kinship relationships, (5) occupation or profession, and (6) personal contacts with other Inupiat. All of these markers of identity are more important to village Inupiat than to their counterparts, and the comparisons by income and employment status follow suit.

TABLE 2.1 Mean social characteristics by degree of market integration

| Variable | Village | Regional centre | Pr. ^a | Sig. | Low HH income | High HH income | Pr. ^a | Sig. | PT or not employed | FT employed | Pr. ^a | Sig. |
|--|----------|-----------------|------------------|------|---------------|----------------|------------------|------|--------------------|-------------|------------------|------|
| Household income | \$49,460 | \$72,089 | 0.000 | ** | \$28,562 | \$88,693 | na | | \$45,295 | \$69,152 | 0.000 | ** |
| Education: % with post-secondary education ^b | 33.86% | 19.33% | 0.016 | ** | 17.92% | 30.98% | 0.000 | ** | 10.58% | 39.04% | 0.000 | ** |
| Percent of HH adults employed full-time | 42.3% | 59.8% | 0.000 | ** | 37.8% | 59.6% | 0.000 | ** | 25.6% | 72.5% | 0.000 | ** |
| Family ties index | 3.97 | 4.03 | 0.364 | | 4.01 | 3.95 | 0.356 | | 3.98 | 3.99 | 0.972 | |
| Social support index | 4.04 | 4.18 | 0.075 | * | 4.00 | 4.18 | 0.016 | ** | 4.04 | 4.13 | 0.283 | |
| Strong ties index | 7.93 | 8.06 | 0.364 | | 8.03 | 7.91 | 0.356 | | 7.97 | 7.97 | 0.972 | |
| Bridging ties index | 2.66 | 3.35 | 0.001 | ** | 2.54 | 3.28 | 0.000 | ** | 2.51 | 3.29 | 0.000 | ** |
| Variation in opinion | 19.33 | 22.80 | 0.031 | ** | 20.45 | 20.79 | 0.821 | | 19.19 | 21.88 | 0.068 | * |
| Participation in civic activities | 3.03 | 2.51 | 0.053 | * | 2.51 | 3.27 | 0.002 | ** | 2.29 | 3.51 | 0.000 | ** |
| Sources of Inupiat identity (5= very important, 1= not at all important) | | | | | | | | | | | | |
| Inupiat food I eat | 3.97 | 3.65 | 0.000 | ** | 3.99 | 3.73 | 0.005 | ** | 3.96 | 3.75 | 0.016 | ** |
| Hunting, fishing, gathering and preserving traditional foods | 3.88 | 3.54 | 0.001 | ** | 3.88 | 3.65 | 0.021 | ** | 3.87 | 3.65 | 0.027 | ** |
| Childhood upbringing | 3.81 | 3.56 | 0.024 | ** | 3.80 | 3.65 | 0.152 | | 3.79 | 3.65 | 0.195 | ** |
| Naming kinship relationships | 3.68 | 3.58 | 0.383 | | 3.76 | 3.51 | 0.033 | ** | 3.71 | 3.56 | 0.205 | |
| Occupation or profession | 3.67 | 3.44 | 0.080 | * | 3.60 | 3.59 | 0.963 | | 3.62 | 3.55 | 0.616 | |
| Personal contacts with Inupiat | 3.64 | 3.60 | 0.746 | | 3.78 | 3.45 | 0.002 | ** | 3.69 | 3.53 | 0.137 | |

^a All are t-tests, except 'Education' which is an ordered nominal variable analysed with a chi-square test. HH = household; PT = part time; FT = full time

^b Weakly significant at the <10% level ** Statistically significant at the <5% level Pr. = probability that there is no difference between the two categories Sig. = Statistical significance

Childhood upbringing is a more important source of identity to village Inupiat and to those without full-time employment, but the difference is not significant by income. Naming kinship relations is more important in low-income households and less important in high-income households. Occupation or profession is less important to hub dwellers (regional centres), presumably because comparatively less of their identity is tied to subsistence activities. Low-income households put the most weight on personal contacts with other Inupiat, while high-income households put the least weight on that marker.

Our regression confirmed earlier findings that strong ties and health are important to well-being. We found no significance to income or employment variables, community size or our bridging ties variable. Other research, however, adds information. As part of her study of nutrition security among the elderly, J. Smith (2007) found that, despite the fact that elders living in urban Alaska have better indicators of health status due to better medical care, their functioning in daily activities and their social integration are better when they live in their home villages, presumably because they have more social support and their participation in community life is more highly valued.

While analysis of the SLiCA data is suggestive, it is limited in several respects. Information on social networks, market activities and other variables we would like to analyse to better understand the effects of economic development on Inupiat society is missing; the dataset does not include Inupiat living in urban areas; and the sample size is too small to isolate the effects of different types of job or development activity. To empirically evaluate these hypotheses about the effects of the expanding market economy on social capital and well-being we must collect new primary data.

Research design for measuring changes in social ties

Our research model entails two levels of analysis: individual and community. The decision agents are individuals, yet the phenomena of interest are the collective patterns that result. There is an externality here. Individual choices take existing social relations as a given; yet the aggregate of individual choices may transform social connectedness and social capital, and therefore well-being. When Martin (2005) found that family ties, social support and living in a long-inhabited whaling community were the most important determinants of well-being, these were exogenous community attributes, not individual choice variables in her model. The market economy in particular promotes individual choices to pursue opportunities for personal gain.

Our (as yet hypothetical) design is a random sample survey of Inupiat shareholders in a regional native corporation, organised under the Alaska Native Claims Settlement Act of 1971. This will provide a coherent set of individuals with strong cultural and family relations living in diverse economic settings. About one-third of the shareholders live in villages, 20% in the regional hub, and 45% live outside the region. This will allow us to analyse in cross-section the patterns of social ties among shareholders by residence and degree of market integration. We can also examine how their social ties vary with employment status (locally employed, remotely employed or unemployed). Because a sample survey provides ego network data and not complete network data, we are lim-

ited to ego- or micro-level analysis and the incomplete inferences we can make to macro- or community-level patterns.

We propose to measure strong and weak social ties and bridging ties with survey questions on contacts for: food sharing, social support, employment information, resource and referral, and political process or 'fate control'. Our proposed survey instrument is based on the subsistence harvest and sharing surveys conducted by fish and game managers in rural Alaska. We will incorporate questions from SLiCA and instruments used in rural Alaska so we can benchmark and leverage the pooled data to extend the analysis in geography and in time.

How will we measure the strength of ties? Granovetter (1995) and Langlois (1977) both define weak ties as infrequent recent contact. Ericksen and Yancey (1980) define strong ties as a relative or friend of the respondent, while people identified as acquaintances are classed as weak ties. Lin *et al.* (1981) add neighbours as strong ties and friends of friends as weak ties. Murray *et al.* (1981) studied academic job search and classified as strong ties mentors and dissertation advisers who know the respondents and their work well. Friedkin (1980) also studied academics and defined a strong tie as one where professional consultation went both ways, while in a weak tie the consultation went one way. Weimann (1980) measured the strength of ties between members of a kibbutz by the tenure and importance of the relationship and frequency of contact. Wellman (1979) asked his subjects to rank order the intimacy of their various relationships. Lin *et al.* (1978) utilised two measures, frequency of contact and the type of relationship named, and got similar results with both. We propose to collect and analyse both measures.

Bridging weak ties are those that connect to social circles different from one's own. 'Difference' is not well defined. Lin *et al.* (1981) found that, for individuals of low socioeconomic status, only the links to persons of higher socioeconomic status have value for occupational mobility. Steinberg (1980) measured differences in organisational memberships. She found that the group with strong ties

was linked to the fewest organizations and individual memberships were concentrated in the same organizations which formed a dense network . . . Groups formed on the basis of weak ties, on the other hand, were linked to more organizations that were loosely knit and individual memberships tended to be scattered throughout these organizations (Steinberg 1980: 19, quoted in Granovetter 1983: 225).

The index that Burt suggests for measuring bridging ties at the individual level is network betweenness (Freeman 1977), an index of the extent to which a person brokers indirect connections between all other people in a network. We cannot calculate this from a sample survey because it requires complete information on the whole network. Burt's purpose for this index is to measure opportunities for information entrepreneurship and individual success. In our application we seek an aggregate measure of linkage between the community—our unit of analysis for understanding the persistence of cultural systems—and diverse external resources. Network constraint (Burt 1992) is an index that measures the extent to which the household's ties are redundant, each to the others. We could use this with subsistence harvest survey data where the entire community is surveyed—the mean index for the whole community would serve as a measure of integration—but not for a sample survey. For our analysis we propose using the proportion of households in each type of community that have ties to households out-

side their community. In doing so we assume that these external ties are non-redundant. Even if different households have ties to the same external community, it is likely to be to a different household in that community.

This proposed methodology provides social network data on people of a common indigenous cultural heritage, representing the full spectrum of degrees of market integration. It targets data on strong and weak ties, bridging ties, information exchange, employment status, socioeconomic status, food security, social support, civic participation and subjective well-being to analyse the effects of development and increasing integration in the cash economy on the social capital and well-being of indigenous people who practise and value traditional social relations of subsistence production.

Conclusion

How do resource development and the associated increase in the cash economy affect social relationships and well-being in indigenous communities? Theory suggests that increases in market activities are associated with decreases in strong, dense ties and increases in weak, bridging ties, which increase material standards of living, opportunities and choice sets for the individual, yet decrease social support and well-being. Our review of existing empirical data shows that living in a regional centre, full-time employment and higher household income are each associated with higher income and education, more bridging ties, more participation in civic activities and differences in the sources of cultural identity, yet showed no significant difference in family ties or strong ties and mixed relationship with social support and diversity of opinion. New primary data on social networks and well-being for indigenous people of common cultural heritage representing the full spectrum of degrees of market integration will be required to tease out these hypothesised relationships.

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