

7-1-2010

Changing Gender Roles and Economies in Taimyr

John P. Ziker
Boise State University

Changing Gender Roles and Economies in Taimyr

John P. Ziker, Department of Anthropology, Boise State University

Abstract

This article is an inquiry into the extent to which, and how, roles of men and women in indigenous communities in north-central Siberia have changed along with the changing economic and political context from the 1917 Communist Revolution to the post-Soviet era. The starting point for this investigation is archived data from the 1926/27 Polar Census of Siberia. Fieldwork conducted in the region in the 1990s and 2000s provides comparative materials. During this 80-year period, the development of centralized settlements and regional urban areas brought increasing professionalization of traditional economic activities and greater involvement of the indigenous population in civil service work. As a result, the flexibility of gender roles in the indigenous pre-Soviet economy was sacrificed in favor of work in state companies and organizations that followed gender contracts imposed following the general Soviet model. In the post-Soviet period, following the collapse of the Soviet planned economy greater flexibility in gender roles has been observed, along with increasing importance of informal exchange networks and reliance upon hunting, fishing and trapping as key inputs to local economies.

Keywords: Work, Subsistence, Taimyr, Dolgan, Nganasan, Nenets

This article explores the extent to which, and how, roles of men and women in indigenous communities in north-central Siberia have changed along with the changing economic and political context from the 1917 Communist Revolution to the post-Soviet era. The starting point is a survey of household and community cards from the 1926/27 Polar Census. The ending point of the discussion is recent fieldwork conducted in the region.

The Polar Census was one of the most detailed enumerations of indigenous peoples in Siberia with over 400 potential data points for each household (Anderson 2005, 2006). The material has become an important historical source for aboriginal demographics, economics, settlement patterns, and lifeways during a critical historical period. Census records from the Taimyr Region summarized in this article contribute to understanding the pre-Soviet history of women's and men's work, inter-household cooperation, and trade. The Soviet period saw increasing integration of the indigenous population with the larger economy and society, gravitating indigenous populations to centralized settlements and regional urban areas. As permanent settlements were constructed in the region families were assigned apartments and many women and men found salaried employment in vertically integrated and state-owned organizations. As a result, changes in gender roles and kinship relations occurred. The Soviet and post-Soviet periods' changes are briefly discussed in light of oral history interviews and ethnographic studies conducted with indigenous people in two communities in the Taimyr Region. The post-Soviet period saw a breakdown of state-owned organizations, high levels of unemployment, alcoholism, and unnatural death.

Related to the question of changing gender roles is the importance of historical changes in economic and social organization that influence household economies and thus gender roles, kinship, and family structures. Such historical economic and institutional changes are the most likely to cause changes in the gender contract. To study the dynamics of changing gender roles,

the causes of such changes should be investigated by exploring the relationship of observed changes to other observed variables. This strategy implies observations throughout time. For purposes of this article, investigation of available census materials can provide information to evaluate changes for approximately the past 90 years, although there may be some additional census sources that could push back further that time frame with limited comparability. In other words, it may be difficult to study the dynamics of changing gender roles, depending on what the sources are, how the data were collected, and whether the same categories of data were collected. Different types of sources may give incomparable information, for example, archival materials, oral histories, contemporary observations and ethnography, and previous ethnographic literature. For the analysis presented in this article I rely upon census materials (1926/27 and 1997 through 2007) that include some comparable data, along with ethnographic interviews and observations. Census materials from 1997, 2001 and 2003 were provided by village administration and sourced from the village registry book, and verified interviews of a small number of key informants (both Tukhard and Ust'-Avam) and in structured interviews of 79 household heads (Ust'-Avam). In 2007, the earlier census materials were updated with the help of two key informants in Ust'-Avam.

One area of contentious debate within anthropology is the definition of "tradition." Some anthropologists claim that there are no traditional families or traditional economic activities of indigenous people of Siberia at all, and all that is left are "survivals" (Oleg Kuznetsov, personal communication). On the other hand, the use of the tradition concept in discussion of indigenous Siberians' adjusting to post-soviet economic uncertainty (Vorob'ev 2001) and land use (Kuchinskii 2007) is well established in Russia, particularly in light of legislation about traditional land use, as in other areas of the world (Kuper 2003). Rather than view tradition as something lasting, stable, or fitting into a neatly carved mold that can not change through time, and that traditions do not exist if they have broken that mold, I argue that traditions necessarily include a great deal of flexibility (cf. Habeck 2005:184; Ziker 2002; Bjerkli 1996). Traditions are behaviors, practices, and representations (i.e., culture) that are learned and copied from ancestors. This does not mean that traditions do not change—traditions are recreated through time and recontextualized. Australian aboriginal dreamtime, a symbol of Australian aboriginal societies, is interpreted in dreaming stories in light of current issues and future challenges. Similarly, in this article I look for continuities and variation in gender roles through time and how such changes correlate with changes in the larger political economy. Such data are potentially of great use because while technology has changed, subsistence strategies, such as reindeer hunting, fishing, and a variety of other hunting and gathering activities have been and continue to be conducted in the Taimyr Region, some since the early Holocene period (Khlobystin, Fitzhugh, and Pitul'ko 2005:81).

Similarly important in approaching transformation of gender relations is the distinction between "facts" such as demographic information and "feelings," and where people may be worrying about changes that they perceive, but which may not be turning up in "facts." For example, in my study region I heard a number of elderly female informants say that young women today do not know how to tan hides, sew, or butcher meat properly. Were these women likewise criticized when they were young? While I do think in the past most young women would know how to butcher, their abilities, or style, may have been the subject of discussion of elder kinswomen. It is difficult to study such feelings in the past. In the present it may be impossible to develop comparable facts since most of the mothers of today's elderly have passed on to their final road.

Finally, this article will attempt to address the question of what is partnership and how does this relate to gender in northern Siberia. Much may be learned from kinship and genealogical method. When using this method it is important to differentiate between rules and behavior. Genealogy may help to document behavior (gender relations) in order to compare with rules (gender contract). For example, many families used to live together in traditional mobile dwellings with a partner family, to whom they may or may not be related as kinsmen. In addition, families travelled together in groups at certain times of the year and split apart at others. It is likely that living with a partner family was an arrangement that made certain tasks more effective. Processing hides, for example, entails much drudgery and sharing the work could have made it more pleasant or effective. It is likely that there was much visiting across the dwelling and between dwellings at these times. Today, analogous mechanisms are still in use. For example, a number of families share the responsibility of feeding their children (Ziker and Schnegg 2005). It is easy to emphasize change without a good knowledge of the past. Maybe there are more continuities than we suspect.

After a brief introduction to the study area, and Polar Census materials from the Taimyr Region, the article moves to a discussion of changes occurring during the period of Soviet development from the 1930s to the 1980s; this discussion will attempt to track changes in gender roles and partnerships. Finally, a discussion of current gender contracts and gender roles will provide the basis to examine continuities and divergences throughout time. This method could be framed in terms of an ethnoarchaeology of demographics that can help scholars and indigenous people themselves understand historical developments over time.

Introduction to the Study Area

The ethnographic research on which this article's interpretations are based took place mostly in the central Taimyr lowlands beginning in January 1994 for a total of 21 months through July 2007. Most of my research has been in the settlement of Ust'-Avam, but I also spent time in the settlements of Tukhard and Kresty Taimyrskie, the village of Volochanka, and at various hunting territories (*promyslovye ugod'ia*), in the Avam tundra. Going back to summer of 1992, I spent another 18 months in Dudinka, the former capital of the Taimyr Autonomous Region (now Taimyr Municipal District as of January 1, 2007) and other small communities across the region (Khantaiskoe Ozero, Levinskii Peski, and Khatanga). This experience over 15 years provides me some perspective on the social roles and strategies that are being employed in the region and how they are affected by economic and political change. The material for this article will focus on two communities, Ust'-Avam and surrounding areas, and Tukhard, in which most of my ethnographic and historical demographic research has been conducted.

Indigenous people on the Taimyr Peninsula began the 20th century as sovereign tribute-paying nationalities within the Russian Empire. Beginning in the 1930s, more than 80 collective enterprises (*kolkhozy*) developed in the region, but throughout the 1950s and 1960s these were amalgamated into 17 larger and more sedentary and ethnically diverse state enterprises (*sovkhozy*). By the 1970s, most indigenous adults worked as salaried hunters, fishers and trappers, craft producers, and laborers within state companies, as well as administrative and educational staff, living in small, often multiethnic settlements. Major economic changes occurred after 1993. State enterprises were stripped of most of their functions other than basic municipal services. The majority of working-age adults were laid off their jobs in 1993. My

ethnographic studies during the 1990s (Ziker 2002) described the increased importance of the local subsistence economy after the collapse of the Soviet planned economy.

The present population in the Avam tundra is approximately 50 percent Dolgan, 45 percent Nganasan, and 5 percent other nationalities from the former Soviet Union. The Dolgan language is similar to Sakha (Yakut), the northernmost branch of the Turkic language family.¹ Nganasan is one of six languages in the Samoyedic branch of the Uralic language family.² In Ust'-Avam and the satellite community of Kresty-Taimyrskii most middle-aged and younger people speak Russian as their first language, but elders know and use their native language within their own social networks and use Russian as the *lingua franca*. In Khatangskii District (*raion*) in eastern Taimyr most people speak Dolgan as the *lingua franca*. Tukhard, located 70 kilometers west of Dudinka in the Bol'shaia Kheta tundra is a predominantly Nenets-speaking community,³ although it also has a mixed heritage with many Tundra and Forest Enets, as well as Dolgan.

My work with the 1926/27 Polar Census began in 2004 upon invitation from David G. Anderson who had been working with these materials for the Baikal Archaeology Project (BAP). The results of my initial analysis of household cards from the central Taimyr lowlands (Ziker 2005) were published in a Russian-language volume edited by Anderson (2005). That analysis focused on the variability of identity and mobility patterns of people in the Avam tundra. One limitation of the source data for the Avam tundra is that many of the household cards from the central Taimyr are missing from the archive (Government Archive of Krasnoiar'skii Krai, or GAKK), and it is not certain where they might be located.

Since then, my work with the 1926/27 Polar Census has continued and additional household cards and community diaries have been made available through research sponsored by the BAP and the European Science Foundation's BOREAS project Home, Hearth, and Household in the Circumpolar North. I have prepared a more robust analysis of subsistence and land/resource use patterns for the historical community of Kamen', which was located in the upper reaches of the Kheta River in the foothills of the Putoran Plateau (Ziker in press). This community was "closed" by Soviet authorities in 1968, and the population was forced to move 400 km southeast to Khantaiskoe Ozero. I had met numerous descendants of the Kamen' community throughout my early research in the region, and my connection to Ust'-Avam was originally made through Kamentsy living in Dudinka. In the 1920s the Kamentsy—a mixed Evenk and Yakut community later classed among the Dolgan—traded and intermarried with people in Volochanka and Ust'-Avam, and the detailed analysis of the available Polar Census materials from Kamen' provided a glimpse into the importance of gender division of labor and kinship ties in enabling families to split apart and come together again for varying subsistence and economic activities throughout the year.

More recently, I expanded my analysis of the 1926/27 Polar Census materials to the region west of the Enisei River on the Bol'shaia Kheta River, home to the predominantly Nenets community of Tukhard (that includes Enets, Dolgan, and Russians as well). I visited Tukhard in 1997 for one month where I spent approximately one week in the tundra with a reindeer-herding brigade and the remainder of the time in the settlement. The analysis of the 1926/27 census materials focused on social organization, subsistence economy and trade, mobility patterns and history of intermarriage in the area (Ziker and Arakchaa 2010). The role of women was found to be particularly important in the fishing economy. The more women and children in the household, the greater the amount of fish caught by the household.

A random sample of household cards from the 1926/27 Polar Census materials for Dudinskii, Ilimpeiskii and Khatangskii Districts (*volost'*—a pre-Soviet administrative sub-unit) was analyzed for any kind of gender-relevant material. This material was reviewed with the assistance of two graduate students (Taiana Arakchaa and Nikki Gorrell). A random sample of 100 indigenous households (beginning at a random number and selecting every fifth indigenous household listed in the census until reaching the target number) was used.⁴ The information the students collected is presented below.

A Random Sample of Households in Taimyr in 1926/27

Fifty households were chosen for Dudinskii District (including the lower Enisei River) and 25 households each for Ilimpeiskii and Khatangskii Districts to provide a representative sample of the population of these districts as a whole. As many of the communities contained in these pre-Soviet administrative districts eventually made their way into the Taimyr Autonomous Region as it formed in the Soviet period, this exercise helps to provide a baseline for questions of gender roles and kinship, historical economic and political changes and the definition of tradition, and the kinds of partnerships present. The sample includes a wide variety of ethnic groups. Actually, the sample of 100 households represents 16 different identity categories. Many of these identities have been subsumed under wider ethnic identities over the last 80 years (Nenets, Enets, Nganasan, Evenk, and Dolgan—the five indigenous groups of the Taimyr Autonomous Region, and few households of Khants and Kets in Dudinskii District sample). In addition, there is greater diversity of identity within households, as many spouses reported various ethnicities and indigenous languages (i.e., Yakut and Tungus, and Nenets and Enets).

The 100 households chosen for this sample included 465 individuals. Table 1 shows the Russian literacy for this population by gender and district. These data indicate a bias in the Russian speaking ability of the indigenous population by gender. Men were more than twice as commonly documented to be proficient in Russian as women.

| Gender | District | Dudinskii | Ilimpeiskii | Khatangskii | Total |
|--------|----------|-----------|-------------|-------------|-------|
| Male | | 59 | 4 | 15 | 78 |
| Female | | 24 | 0 | 7 | 31 |

Table 1. Russian-speaking indigenous adults in the sample of 100 households by district, gender

The Russian-speaking population rate for Dudinskii District is in the highest, followed by Khatangskii and Ilimpeiskii Districts. This likely reflects the degree to which local people were involved in trade with the Russian population as well as the influence of the Russian Orthodox Church and Russian immigrants. Traders, missionaries, and immigrants had easier access to the indigenous population along the Enisei River, being able to travel north from Krasnoiarsk during open water. It follows that the indigenous people living in that district had the greatest proportion of Russian-language fluency. In addition, the Zarechnye/Zatundrinskie Dolgans—i.e., those living east of the Enisei River tundra zone—were descended in part from Russian trappers who settled. That men are documented as having greater Russian-language fluency than women is an interesting, but questionable, finding. The main issue is that simply we do not know the extent to which women expressed themselves in the enumeration process. Notes in the Polar Census

indicate that in most cases the male household head, or a close male relative, were often the subject of the interview (e.g., “the household head was interviewed” (*oproshen sam khoziain*) and “brother of the household head was interviewed” (*oproshen brat khoziaina*)). In such cases, full information about the activities and abilities of women in the household could have been more easily withheld. Thus, a direct comparison of men and women should be viewed skeptically. Since such a bias in the enumeration procedures operated across census districts, so comparisons within each gender are likely to be more reliable than across each gender. However, Russian-speaking abilities were more common among women in Dudinskii District as opposed to the other two districts.

A raw count of the types of occupations listed for our random sample of 100 households indicate a heavy reliance on hunting and fur trading, reindeer herding, fishing, and processing hides. Fewer households were involved with formal work groups (*arteli*) or were members of consumer co-operatives, and even fewer still provided transportation services or had other specialties. Table 2 shows the occupations listed for any member of the household in our sample alongside the number of women documented as having that occupation.

| Occupation | Total number of individuals | Number of Women |
|--------------------------|-----------------------------|-----------------|
| Hunting and fur trapping | 98 | 8 |
| Reindeer herding | 86 | 16 |
| Fishing | 78 | 40 |
| Processing hides | 67 | 64 |
| Work group/ co-op member | 26 | 3 |
| Worker | 10 | 0 |
| Transportation | 8 | 0 |
| Berry collecting | 2 | 2 |
| Sleigh maker | 2 | 1 |
| Carpenter | 1 | 0 |
| Shaman | 1 | 0 |
| Household heads | 97 | 3 |

Table 2. Household economy occupations for the random sample of 100 households

In some cases adult female occupations were not listed, but the information from those households where the female occupations were listed helps to expand on the ethnographic literature of the region and to answer our questions about gender roles, tradition, historical change, and partnership. Processing hides was an activity that was dominated by women. Fully 95 percent of the individuals conducting hide processing were women. Processing hides is often mentioned in the ethnographic literature as woman’s work (e.g., Popov 1966), but it is not the

universal domain of women as shown in the Polar Census. This fuzzy division of labor continues today in the contemporary Ust'-Avam community, where I documented the work of one elderly man, who was too old to travel to and check trap lines, but nevertheless helped to process the hides that his adult children obtained, and he baked loaves of delicious bread for the household as well.

Oral History and Gender Relations

In order to help understand traditional gender roles, I asked several elderly community members in Ust'-Avam in 2007 about women's and men's involvement in hunting and herding in the past. Here is an excerpt from an interview of one informant, regarding her uncle who was born before collectivization:

Galina: They said he went to the ocean. He found and killed the wild deer; he cooked food for the winter; he prepared in different ways; and he dried it. Before, they boiled meat, they crumbled it, dried it. It was easy to do it, and then they put it in the sacks. They prepared this meat with grease (*amaha*) and ate it.

In the same interview, Galina talked about the role of her mother and aunts:

Galina: My mother was like a man. She rode and wore clothes like a man, in all white clothes.

Ziker: Why did she wear clothes like a man?

Galina: The old man trained her because he had only one child left. He trained his younger daughter to hunt and to ride like a man.⁵ My mother was a go-ahead girl.

Ziker: How did she hunt? For what?

Galina: For everything –wild deer, polar foxes, hares.

Ziker: Did she hunt when she was young or her whole life?

Galina: When she was young. When she got married to my father she gave up everything, because it's a sin for a woman to hunt...If you get married you must not hold a gun.

Eight women in the 100 household sample were mentioned as being hunters and fur trappers in the 1926/27 Polar Census. This result indicates some degree of flexibility in gender roles at the time. This gender flexibility allowed for families and households to compensate for demographic variability. Galina's mother's family had no sons. She and her father maintained their reindeer herd and successful household until she married.

In the 100 household sample, a division of labor can be observed with significant overlap across gender lines. Although men tend to dominate hunting and trapping while women tend to dominate processing hides, the flexibility in work arrangements helped families survive and continue to participate in activities that were the backbone of the trading economy. Women were integral to the ability of households to trade at both productive and processing stages. Without the work of women in both production and processing it would have been impossible for households to trade for the consumer goods (mostly carbohydrate foods and hunting supplies) that they had become accustomed to by the early 20th century. They were producing more furs,

fish, and meat than they needed for subsistence in order to have something to trade—an imperative going back at least as far as the early colonial period when tribute (*iasak*) was taken by colonial representatives, and merchants began to operate in the region.

Partnerships, beyond husband and wife, were also integral to domestic economies of scale. I report (Ziker in press) that B.O. Dolgikh, the Polar Census enumerator of the Kamen' community and later well-known Soviet ethnographer, describes one household, "Davyd's *balagan*" (a traditional Yakut semi-subterranean dwelling), as being "in charge of buying groceries" for a group of five households that traveled together throughout the year. That group of households traveled frequently and occasionally even very long distances (to Lake Essei in Evenkia) in order to trade. This partnership of families pooled their resources (mainly processed furs) and marketed them through Davyd, who was portrayed as the patriarch of the group and exploiter of the poor. In reality, two of the families were related through marriage to Davyd, and the others were working with him because they received reindeer in payment for work, allowing them to slowly build their own herd. In the Polar Census community diary⁶ for Kamen', Dolgikh writes that relatives and others served as 'workers' for owners of large reindeer herds. In reality, a complex web of kinship and voluntary association made this sub-band successful.

In 1926/27 slightly over half of the fishing in the 100-household sample was being conducted by women. Again, this finding suggests that women were more intensely involved in basic subsistence activities than they are today, at least as I have observed in the communities of Ust'-Avam, Kresty (Piasina River), Khantaiskoe Ozero, and Tukhard, where women are rarely observed fishing at present. Women do process and preserve (drying and smoking) fish in these areas mainly during the summer and early fall. They rarely check nets in fall and winter when the bulk of fishing occurs. The Polar Census did not give any detail on how women were involved in fishing in 1926/27, but obviously their work was important. They could have been mainly processing and preserving, thus further evidencing continuity.

In 1926/27 Tukhard almost all households practiced fishing with the exception of one household of a single woman who worked as a laborer for a work group (*artel'*) (Ziker and Arakchaa 2010). Fishing had a big role in this Nenets and Enets community at that time. In analyzing the reported catches, it was found that the greater the number of household members, the greater the amount of fish which was traded or supplied to the consumer cooperative.⁷ Only a few households in the Tukhard area traded items produced from reindeer: bedding, leg hide (*kamus*) and meat. Mostly reindeer products were reserved for subsistence use. This pattern changed during the Soviet period, when reindeer herding for meat production became predominant. In the post-Soviet period, fishing became the predominant productive activity for some families.

The random subsample of 100 households from three districts in the 1926/27 Polar census allows for a cross-community analysis of gender roles, traditional economic activities, and familial partnerships. These census data indicate a relatively high proportion of women being involved in a variety of "male" activities in partnership with husbands or on their own. This information is corroborated by interviews of elderly participants in Ust'-Avam. This flexibility in the gender contract can be seen as a kind of historical baseline to examine the continuity of gender roles and economic activities into the present. Some of these subsistence activities continue on today among women—an observation to be discussed below after a review of Soviet era changes in the region.

Soviet Period Changes

As Soviet integration of the indigenous population of Taimyr progressed from the 1930s through the 1950s and 1960s with the institution of *kolkhozy*, and then was intensified in the 1970s and 1980s with the institution of *sovkhozy* and a *gospromkhoz* (government hunting enterprise), economic roles became progressively more closely associated with one or the other gender. The experiences of men and women in the communities of Ust'-Avam and Tukhard were somewhat different. Reindeer herding under the *sovkhoy* in Ust'-Avam (and all central Taimyr communities) was "closed" by the regional agricultural bureau in the late 1960s.

Authorities decided to withdraw reindeer husbandry from the production profile of the state-led enterprise in the area of Ust'-Avam, and within a few years it practically disappeared. In Ust'-Avam a vertically integrated and industrialized hunting economy ensued under the *gospromkhoz*. On the other hand, in Tukhard reindeer herding continued and intensified under the *sovkhoy*.

In both communities women continued to make major contributions to the outfitting of the family in an informal manner (e.g., clothes and outdoor gear, cooking, and reindeer herding). At the same time, many women were employed to provide household-like tasks for various units of state enterprises. In the reindeer herding brigades of Ust'-Avam in the 1950s-1960s, and Tukhard in the 1950s-1980s, some women were employed as "tent workers" (*chumrabortnitsy*), formally providing domestic services such as cooking, clothing, gear repair, and fur processing to reindeer-herding brigades (cf. Vitebsky, this issue). Later, in Ust'-Avam, women continued to support their husbands in their work in the tundra (cooking, clothing, repair, and fur processing), while some activities, such as craft production—requiring skills that were critical to the pre-Soviet domestic labor economy, such as sewing—developed as professional labor under the *gospromkhoz*.

In both communities families were alienated from the land, but in different ways. Since reindeer herding was removed from the profile of state economies, men in Ust'-Avam worked 9-10 months a year at their hunting or fishing territories, while women's work as nannies, teachers, cultural workers, and laborers was based in the village. In Tukhard, more families stayed in the tundra with the reindeer brigades. In 1993, 77 households (approximately two-thirds of the population) were still involved in reindeer herding either under the former state enterprise or newly formed family-clan holdings. Many brigades were comprised of extended families. Similarly, but not to as great an extent, in Ust'-Avam 10-12 families (approximately one-tenth of the population) lived in houses built at hunting territories along the Dudypta River.⁸ These tundra houses contain two to four "apartments." Relations between the families at most of these locations were good as they had extended kinship connections or affinal relationships. However, at one hunting territories there was major, long-term conflict between the two hunters and their families (one being Dolgan and the other being Nganasan/Enets), and relations were not violent, but unsavory.

The major change in Ust'-Avam was the abandonment of reindeer herding in the early 1970s in favor of hunting wild reindeer. This reduced mobility and created greater dependencies on the industrial economy. Taimyr has one of the largest wild reindeer herds in the world, and the Ministry of hunting of the USSR established the *gospromkhoz* Taimyrskii in 1971 as a way of industrially exploiting the wild reindeer that migrate in massive numbers through this area for food supplies to the growing industrial cities in the region.

By the mid-1970s in Ust'-Avam most adult men were employed in the *gospromkhoz* as staff hunters (*shtatnye okhotniki*) and women were employed as seamstresses in the sewing workshop, or *poshivtsekh*.⁹ Staff hunters worked in brigades at a series of hunting territories surrounding the village. They worked for six to ten months at their brigade territory, and came to the village occasionally during that period for resupply and visiting family. Women and children generally stayed in the village. (Except for the families that lived in the tundra full time: they made very occasional trips to the village to bring children to school and pick them up for holidays and to resupply.) I am not aware of any female hunters or male seamsters in Ust'-Avam during the Soviet period.

Women more often made their way to the city (Dudinka or Norilsk) than men for post-secondary education. Informants in Ust'-Avam told me that it was typical for women to return after a few years to the village as teachers or other professional staff when they were a bit older and already had children. In the villages there are many relatives to help with childcare and food. Indigenous women more commonly married non-indigenous men who had settled in the village after working on construction jobs or in the *gospromkhoz* management. Marriages between Russian women and indigenous men were few and far between in the villages.

Women in Ust'-Avam were still responsible for clothing family members in the Soviet period, and women spent hours after work day after day sewing traditional-styled moccasins (*cherchakhoty*, Dolg.), parkas, fur hats, and gloves which men used mainly during travel in the tundra. Some of the material for these items was scavenged from goods provided by the state enterprise. For example, inner moccasins were widely made from old sheepskin coats (*shuby*, Rus.) provided to hunters and workers. Traditionally, these were made from smoked reindeer leg hide, or *kamus*. The outer moccasins continued to be made from reindeer *kamus*, commonly using up supplies left over from the 1970s when families still had domesticated reindeer. Thus, women in Ust'-Avam continued to provide domestic labor services essential to the success of their husbands' jobs in the state enterprise, while holding down their own professional jobs.

Industrial development took a different track in the Tukhard area. It occurred not without contest and criticism within the community. Tukhard settlement is situated on the bank of the Bol'shaia Kheta River, a tributary of the Enisei River. In 1968 Tukhard became the starting point for the construction of the gas pipeline Messoiakha-Dudinka-Norilsk. Because of the industrial development of the pipeline and the industrial base called "Fakel" located adjacent to Tukhard, economic and social connections to people from Norilsk developed. Despite these connections, and perhaps because of these connections, reindeer herding and subsistence activities remained strong through the Soviet period. Helicopters serving the gas pipeline construction could take meat and fish on return trips. Nonetheless, the array of pipelines and roads that crisscross the tundra provide obstacles for reindeer and reindeer herders.

As settlements were built in Taimyr and children sent to boarding schools (in the 1950s and 1960s), families were separated and gradually moved off the land. This alienation from the land, while not unitary across communities, is something that is lamented to this day, even amongst those who barely experienced this way of life as children in the early 1970s. One informant in Ust'-Avam, born in 1965, told how he used to ride his reindeer and sleigh from the brigade territory into the village for school every day. In Tukhard, many people remained on the land with their reindeer—as brigades in a *sovkhoz*—and relative autonomy from village life helped them to maintain their native language, their dress and gear, and their living quarters—hide-covered living sleighs in the winter, and conical hide covered tents in summer. Mobility patterns were also kept to a greater degree than in the case of Ust'-Avam. Women in Tukhard

sewed and maintained outerwear and dwellings, maintained responsibility for everyday tasks, such as gathering firewood and water and cooking, and also helped with reindeer herding. Having women out in the tundra with the herders—not only the occasional *chumrabortnitsa*, but elders, adult children, their wives and children—put the Tukhard reindeer herders in an advantageous position at the end of the Soviet period. They easily transitioned to a semi-autonomous subsistence economy with supplemental exchange, since they did not require as many of the industrial inputs like snowmobiles and fuel, as did hunters in Ust'-Avam.

Ironically, the ostensibly egalitarian socialist system had the effect of hardening gender roles in Taimyr during the Soviet period. The system that was set up to integrate the population into the larger economy brought with it preconceived gender relations that were typical of that mode of work (hunting versus crafts production) and came to structure work in socialist enterprises. In order to bring the population into this system, traditional political-economic structures were broken up as a first step: Owners of large reindeer herds and shamans were excluded from decision making in early nomadic and clan soviets. The *kolkhoz* period (1930s-1960s) saw the continuation of reindeer-powered mobility, but gravitation to settlements increased. There, trade goods were cheap, and services and minimal education was provided. Eventually, families were broken up as children were sent off to boarding schools in larger communities, and men and women were separated into vertically integrated production units in *sovkhozy* and other state-owned enterprises.

Post-Soviet Period

With the end of the Soviet Union, the system that was set in place to break up domestic economies and build socialist ones, while never completely successful, weakened. It weakened so much that the indigenous people in Ust'-Avam felt, to varying extents, let down and abandoned. A common phrase in the 1990s, "*zhivite, kak khotite*" (live as you like), summarized how local people felt about the government's new and vastly diminished role in their lives. The 1990s was a period of extreme economic hardship for indigenous communities in Taimyr. People were laid off, pensions and other government payments were chronically delayed, and prices for basic goods skyrocketed. Scholars have noted that personal relationships and connections were used extensively during the Soviet era to overcome challenges and limitations in the planned economy (Verdery 1996). Such personal networks became more important in the post-Soviet period.

Hunters who had been working with the *gospromkhoz* in Ust'-Avam and the *sovkhoz* in Tukhard reoriented to firstly satisfy immediate family and community subsistence needs and secondarily participate in exchanges in wider economy. Immediate family and community needs were largely satisfied through non-market mechanisms (Ziker 2006). Exchanges with the *gospromkhoz*, private traders, or organizations in the city in the larger economy were risky: many stories circulated in the community about payments that were regularly delayed, discounted or never received. On top of these changes, the price of alcohol was at a premium in indigenous communities, which encouraged profiteering and community-wide binge drinking on payday, when they did occur. Demographic indicators showed and continue to show the results of drinking.

Alcohol abuse influences both the mortality and fertility rates in indigenous communities in Taimyr. In the period from 1998 to 2003, over 70% of all deaths in Ust'-Avam were due to unnatural causes (n = 34) with a minority due to natural causes (n = 14). Unnatural causes were

almost all alcohol related or directly caused by alcohol, including accidents, suicides, and alcohol poisoning. Analyses of variance (ANOVA) by cause of death showed age at death to be a very significant source of variance ($F = 77.243$, $p = 0.000$): younger people were susceptible to unnatural death and older people commonly died of natural causes. Ethnicity, gender and a suite of other variables representing economic status of individuals did not vary significantly among those who died by natural or unnatural causes.

The population age-structure of Ust'-Avam shows approximately half of the population are younger than age 20 with high fertility rates in the 1980s (Ziker 2002:91-95). In 1993 to 1997 there are approximately half as many children in the 0-to-4-year age category as in the 5-to-9-year age category. This reduction in fertility coincides with the economic shifts beginning in 1993 in the village. This pattern continues in the early 2000s, along with the continuing hardships (as elsewhere in rural Russia) and resulting in low fertility rates (Ziker 2009).

Demographic indexes considered for the 100 household sample from 1926/27 also show low fertility rates. The general fertility rate (the number of live births divided by the number of women from 15 to 49 years of age) in 1926/27 was 0.070 with 9 babies born from 128 women. Hern (1995) provides a range of normal general fertility rates (GFR) documented by the World Health Organization (0.088 to 0.305). The rate for the 100 household sample is significantly lower than this range, but similar to the GFR (0.071) I documented in Ust'-Avam during the mid-1990s (Ziker 2002). Even more surprising, the GFR averaged over the five years between 2003 and 2007 in Ust'-Avam was 0.051, so the historical fertility rates for region are low, but they look high considering the recent trends in the region.

After 1993, Dolgan and Nganasan hunters and Tukhard reindeer herders no longer received salaries. *Sovkhoz* Tukhard and the *gospromkhoz* Taimyrskii were stripped of most of their functions other than basic municipal services. Both organizations continued to cut deals and sign contracts with hunters and herders for sale of some products (reindeer meat, fish, and fur). A similar piecemeal arrangement was made with women who had worked in the sewing shop in Ust'-Avam. Payments were far from regular and since the ruble value was rapidly changing, long delays meant significant devaluation of contract amounts. In Tukhard, about one-third of the reindeer-herding households joined an association of eight family-clan holdings called in Nenets *Numpaan* (Rainbow) in 1994. These households had joined in a land claim from the region (organized by a former official of the *sovkhos*!), were granted reindeer pasture and hunting grounds, and hoped that a private/cooperative structure could help them market their products more effectively than through the old *sovkhos*. In 1997, when I visited Tukhard, the mayor told me that neither *Numpaan* nor the former *sovkhos* could provide regular trade services for their members. The economic changes occurring after the fall of the Soviet Union devastated community morale, and this resulted in increased rates of violent death and reduced fertility (Ziker 2002).

In Ust'-Avam women, many of whom worked in the *gospromkhoz* sewing shop, were reclassified as hunters in 2000 for administrative reasons. While this may imply an interesting change in terms of gender relations, it actually meant that the *gospromkhoz* would no longer buy caribou-fur uppers for boots (*untaiki*) from women, and a cessation of the formalized crafts industry was more or less permanent. Since hunters did not receive salaries anymore, and any money they received was in exchange for goods turned in, it was unlikely that the middle-aged and elderly women of the sewing shop would be making any income from their classification as hunter, and beyond that, because they officially had jobs they would not be eligible for unemployment payments.

There are a variety of occupations in Ust'-Avam for women and men, many of which are not based on hunting, herding, and fishing. Several community members are employed as teachers, civil servants, nurses, janitors or shop assistants, and many people receive social security pensions and environmental degradation compensation from Norilsk Nickel, a mining and metallurgy combine. Most incomes in 2003 ranged from US-\$0 to 5,516, annually, with a mean of \$1,256 for all participants in a survey of 59 adults I conducted in 2003.

Since hunters and their families were no longer required after 1993 to produce large amounts of meat, fish and fur for state enterprises, families that were based in villages spent more time in the village than at hunting spots. This situation was particularly prominent for Ust'-Avam. Young men, growing up in the 1990s and 2000s, spent most of their time in and around the village. A number of enterprising young men had trap lines within walking distance of the village, and they fished, and hunted in this area as well. Families that lived in the tundra had a different experience and were much more attuned to hunting, fishing, and trapping knowledge. I observed one young mother in Volochanka, who proudly wears a traditional parka, trapping ptarmigan and hare in 2003. Most young men living in Ust'-Avam village, however, are reluctant to work as hunters because they do not have the skills. The prospects of making a living through hunting are tough, even for the best. One possible result of this was a string of suicides of young men in Ust'-Avam in the early 2000s. Many adults in the community were at a loss to explain these suicides, several bursts of which took place over relatively short periods of time. The ability for young men to demonstrate self-esteem was likely connected to their prospects in the larger economy and experience in traditional activities. In 2007, the Taimyr regional government instituted a new social-support program called "Tundrovik." Unemployed indigenous men and women were eligible to apply for the program if they moved to houses located in the tundra. Individuals enrolling in the program get monthly payments. Four women and 14 men were registered as tundra man (*tundrovik*) or tundra woman (*tundrovichka*) in 2007.

In Tukhard, the response of community members to the freedoms and hardships of the 1990s was slightly different. Reindeer herding families pulled their children out of school in Tukhard at relatively early ages. After completing elementary or middle school, both young girls and young boys were beginning life as reindeer herders, hunters, and fishermen. Informants stated that they wanted their children to be versed in traditional activities and that if they were able to read and write, this was sufficient formal education. In fact, during my brief stay with a reindeer herding family in early May, 1997, I saw young boys and girls doing significant work rounding up reindeer, packing brush to burn in hearth stoves, and collecting snow to melt for water.

In both communities, informal networks helped the populations deal with the unpredictable economy. To some extent this represents increased reliance on informal domestic economies that existed in parallel with the vertically integrated enterprises of the planned economy. Women are important in distribution and consumption networks, oftentimes responsible for transferring food to relatives, neighbors, single mothers, and the elderly.

Conclusions

This article explored the extent to which, and how, roles of men and women in indigenous communities in north-central Siberia have changed along with changes in the larger economy in the time period from the 1917 Communist Revolution to the post-Soviet era. With Soviet integration of the indigenous populations into the planned economy, gravitation of

indigenous populations to centralized settlements and regional urban areas, an increasing professionalization of traditional economic activities occurred in state companies, and many new professions were introduced to the population through the civil service. As a result, the flexibility of gender roles in the pre-Soviet economy was sacrificed in favor of relatively well-paid jobs (by Soviet standards) in state companies and organizations. The job descriptions in the organizations were templates of a gender contract imposed from above: men were hunters and women seamstresses or *chumrabortnitsy*. In addition, women occupied many of the jobs requiring a level of education, in civil service, or dealing with children, while men generally occupied ancillary jobs in which Soviet military training and technical education could be applied, i.e., laborer (*raznorabochii*), welder, tractor driver, and electrician. Kinship relations, which were important avenues of economic exchange and cooperation in the pre-Soviet past, facilitating fission and fusion of extended families throughout the seasonal rounds and the accumulation of trade goods, were intentionally dismantled during the Soviet period, although people continued to maintain such relations informally through food sharing networks, marriage alliances, and nepotism in formal institutions.

Related to the question of changing gender roles is the importance of historical changes in economic and social organization that influence household economies and thus gender roles, kinship, and family structures. With the post-Soviet period break-up of state-owned organizations, in general local populations have responded with strategies that emphasize and utilize kinship and friendship networks. These networks have been employed in the process of appropriation of resources, as well as the distribution throughout the community, and consumption in extended family groups. Relatives and friends are in large part the source for hunting partners. The majority of hunters continue to be men, although a number of women are being paid to be hunters in the Tundrovik program, and many more participate in occasional fishing and berry and mushroom gathering activities in summer. On my last trip to Ust'-Avam in 2007, several male informants told me about a couple of women who walked out of the village and hunted wild reindeer who were massing nearby in the fall. One of these women, a recent immigrant to the village from a community in Khatangskii District, is respected as a full-time hunter. These developments indicate a growing flexibility in gender roles that may mirror pre-Soviet conditions.

However, there is little evidence for an intentional and explicit reinvention of traditions, be it in terms of gender roles or in any other respect, in Taimyr. Individuals and families are employing strategies that make sense within their ancestral frames of reference, which extend back in time to the pre-Soviet period, and the current situation. I have taken the perspective that tradition is relative to what is learned and transmitted from ancestors, rather than picking a particular period of time to define traditional gender roles and to compare the situation of today to that definition. For example, reindeer herding is commonly perceived as a 'traditional' activity by people both in Taimyr and outside, and as such is not supposed to change. The evidence from the Polar Census is that in the mid-1920s reindeer herding was important as a means of transportation, as the main trade items recorded were furs (along with fish in the Tukhard area). The Tukhard community has at least four times as many reindeer today (17,000 head) as they did in the 1920s (4,080 head), and selling meat is the biggest source of cash (Ziker and Arakchaa 2010). This change in large part is a result of Soviet developments to encourage meat production and the increased migration of wild reindeer. So, despite all the dynamics and changes in reindeer herding and the gradual "modernization" of this business, the indigenous inhabitants of Taimyr see it as a traditional activity, as is the case with hunting and fishing.

Many traditions are more obviously consistent. For example, one of the goals of Soviet power was to remove traditional indigenous institutions, such as mutual aid (Forsyth 1992:294). But hunters in Ust'-Avam continue to talk about mutual aid ("vzaimno-obratnaia pomoshch'") as an important aspect of the Law of the Tundra (Ziker 2002, 2003), and reciprocity is a major element of food sharing at meals (Ziker and Schnegg 2005). In addition, the relationship of indigenous hunters and herders in Taimyr to reindeer, wild and domesticated, is permeated with rituals and expressions of tenderness that I did not observe with non-indigenous hunters. For example, in Tukhard, when I observed a reindeer being slaughtered, the herders were careful not to spill any blood, and the men of the camp drank every last drop, scooping it out with enamel mugs. Similarly, in Ust'-Avam, there is a careful and respectful way of treating and butchering a wild reindeer. The distinction should be kept in mind between facts, such as recorded number of reindeer, occupations, and other demographic information, and more subtle acts, practices, and discourses that represent continuities with past economies and gender roles. In addition, many people in Taimyr today feel that they are "following tradition" as reindeer herders, fishermen, hunters, traders, and craftspeople.

Finally, this article provided some data to the question of partnership and how it relates to gender in northern Siberia. Women were integral partners with men in the productive process in the pre-Soviet period. Women performed important roles in the fishing economy and in fur processing, both necessary for families to trade. Today, most women still perform some roles in the subsistence economy, particularly in food distribution and processing, and more women are starting to become active hunters in their younger years. While kinship remains an important factor biasing food distribution and other cooperative behaviors, terminological aspects of kinship are changing with the loss of indigenous languages and traditional settlement patterns and marriage alliances. This may reflect the imposition of equality from above and the generally bi-lateral nature of the informal economy as it developed during the Soviet period.

Acknowledgements

I wish to acknowledge the good will and hospitality of my friends in Ust'-Avam and Tukhard. This research was supported by a grant from the National Science Foundation, OPP 0631970, Home, Hearth and Household in Siberia and Northern Canada, part of the ESF BOREAS project Home, Hearth and Household in the Circumpolar North. The write-up of this paper would have been impossible if not for the support of Fulbright Canada and the Department of Archaeology at the University of Calgary, where I was Visiting Fulbright Chair of North American Studies for the 2009/2010 academic year. I also thank the editors of this special issue for their insightful comments and suggestions.

Notes

¹ There is local debate as to the distinctiveness of the Dolgan language, with some arguing it is a dialect of Yakut. In fact, there is a Western dialect of Dolgan (farther from Yakutia) and an Eastern style that is more similar to Yakut. I have documented many word substitutions in the Western dialect. For example, in the West they speak *tyali* (literally, tundra language), but in the East they speak *hakhali* (a dialect of Sakha). Ust'-Avam is within the *tyali*-speaking population.

² Nganasan is an endangered language with fewer than 1,000 speakers. The Nganasans were earlier known as the Tavgi Samoyed and Vadei Samoyed, reflecting a similar distinction between Western and Eastern language communities (Popov 1966). Nganasan is really a misnomer introduced after the Soviet revolution—it means “man.” The Nganasans call themselves Nya (“people”) according to residents of Ust’-Avam and Popov (1966:11).

³ Nenets is a northern Samoyedic language, related to Enets and more distantly to Nganasan. Nenets populations moved into the region during the Russian colonial period, had armed conflicts with ancestors of the Enets, and by the turn of the 20th century mixed Nenets, Enets, and Dolgan bands migrated up and down both sides of the Enisei River. Nenets language and dress became predominant in Tukhard.

⁴ Data provided from the Gosudarstvennyi Arkhiv Krasnoïarskogo Kraia (GAKK 769-1-404 through 769-1-442, household cards).

⁵ Much ethnographic documentation and analysis of women’s social roles show that family relations in egalitarian societies are not merely incipient forms of those in hierarchical societies (Leacock 1978).

⁶ National Archive of the Sakha Republic [NARS] 70-1-789:305-321v. Settlement card: “Kamen’ population.”

⁷ At that time, trade organizations were mostly taking fish and furs worth in the range of 50-200 rubles per year per indigenous household. In exchange these organizations were selling foods, such as rye and wheat flour, toast and other hard baked items, butter, tea, sugar, salt, bread, as well as consumer items, such as dishes, fabric, tobacco, and hunting inventory items, such as powder, shot, caps, rifles, net material and other products. For households that reported fish catches less than 100 poods (a pre-revolutionary measure equaling 16.38 kg), approximately half of that fish was traded. For households that reported catches greater than 100 poods, 70 to 90 percent of the fish was traded.

⁸ These families sent their children to the village for school where they lived at a boarding school (*internat*) located in the school for eight months a year.

⁹ The workshop mainly produced the bead-decorated fabric sections for rubber-soled winter boots (*untaiki*) that were assembled at a larger workshop at the main office of the *gospromkhoz* outside Norilsk. The larger workshop mostly employed Russians with the exception of one or two artists (men) who produced souvenirs.

References Cited

Anderson, David G., ed. 2005. *Turukhanskaia ekspeditsiia Pripoliarnoi perepisi: Etnografiia i demografiia malochislennykh narodov Severa* [The Turukhansk Polar Census Expedition:

Ethnography and Demography of the Small Numbering Peoples of the North]. Krasnoiarsk: Krasnoiarskii Kraevoi Kraevedcheskii Muzei.

Anderson, David G. 2006. "The Turukhansk Polar Census Expedition of 1926-1927 at the Crossroads of Two Scientific Traditions." *Sibirica* 5(1):24-61.

Bjerkli, Bjørn. 1996. "Land use, Traditionalism and Rights." *Acta Borealia* 13(1):3-21.

Forsyth, James. 1992. *A History of the Peoples of Siberia: Russia's North Asian Colony 1581-1990*. Cambridge: Cambridge University Press.

Habeck, Joachim Otto. 2005. *What it Means to be a Herdsman: The Practice and Image of Reindeer Husbandry Among the Komi of Northern Russia*. Münster: Lit Verlag.

Hern, W.M. 1995. "Micro-Ethnodemographic Techniques for Field Workers Studying Small Groups." In *The Comparative Analysis of Human Societies: Toward Common Standards for Data Collection and Reporting*, ed. E.F. Moran, pp. 129-148. Boulder, CO: L. Rienner Publishers.

Khlobystin, Leonid P., William W. Fitzhugh, and Vladimir V. Pitul'ko. 2005. *Taymyr: The Archaeology of Northernmost Eurasia*. Washington, DC: Arctic Studies Center, National Museum of Natural History, Smithsonian Institution.

Kuper, Adam 2003: "The Return of the Native." *Current Anthropology* 44(3):389-402.

Kuchinskii, M.G. 2007: *Ritorika traditsionnosti i realii prirodopol'zovaniia* [Rhetorics of Tradition and Realia of Nature Use]. Moskva: Nauka.

Leacock, Eleanor 1978: "Women's Status in Egalitarian Society: Implications for Social Evolution." *Current Anthropology* 19(2):247-275.

Popov, A. A. 1966: *The Nganasan: The Material Culture of the Tavgi Samoyeds*. Bloomington: Indiana University Press.

Verdery, Katherine. 1996: *What Was Socialism and What Comes Next?* Princeton: Princeton University Press.

Vorob'ev, D.V. 2001: *Zhizneobespechenie i adaptivnaia strategiiia evenkov v kontse XX v. (Sever Turukhanskogo raiona Krasnoiarskogo kraia)* [Life-Support System and Adaptive Strategy of Evenks at the end of the 20th Century]. Moskva: Institut Etnologii i Antropologii Rossiiskoi Akademii Nauk.

Ziker, John P. 2002. *Peoples of the Tundra: Northern Siberians in the Post-Communist Transition*. Prospect Heights, Illinois: Waveland Press.

- . 2003. “Assigned Territories, Family/Clan/Communal Holdings, and Common-Pool Resources in the Taimyr Autonomous Region, Northern Russia.” *Human Ecology* 31(3):331-368.
- . 2005. “Tsentral’naia Taimyrskaia nizmennost’ v 1926/27 gg.” [Central Taimyr Lowlands in 1926/27]. In *Turukhanskaia ekspeditsiia Pripoliarnoi perepisi: Etnografiia i demografiia malochislennykh narodov Severa*, ed. David G. Anderson, pp. 79-87. Krasnoiarsk: Krasnoiarskii Kraevoi Kraevedcheskii Muzei.
- . 2006. “The Social Movement of Meat in Taimyr, Northern Russia.” *Nomadic Peoples* 10(2):105-133.
- . (In press). “Subsistence and Residence in the Putoran Uplands and Taimyr Lowlands in the 1920s.” In *The 1926/27 Soviet Polar Census Expeditions: A Re-discovery of Russia’s Northern Peoples and Their Lands*, ed. David G. Anderson. London: Berghahn.
- Ziker, John P. and Michael Schnegg. 2005. “Food Sharing at Meals: Kinship, Reciprocity and Clustering in the Taimyr Autonomous Region, Northern Russia.” *Human Nature* 16(2):178-210.
- Ziker, John P. and Tayana Arakchaa. 2010. “Nentsy ‘ognennogo chuma’ na zapadnom beregu Eniseia: Natural’noe khoziaistvo, obraz zhizni i sotsial’naia organizatsiia” [The “Fire-Tent” Nenets on the West Bank of the Yenisei River: Domestic Economy, Lifeways, and Social Organization]. In *Pripoliarnaia Perepis’ 1926/27 gg. na Evropeiskom Severe (Arkhangel’skaia Guberniia i Avtonomnaia Oblast’ Komi)*, ed. Konstantin B. Klovov and John P. Ziker, pp. 348-378. Sankt-Peterburg: MPSS.

About the Author

John P. Ziker is Associate Professor of Anthropology at Boise State University. He has conducted research in Siberia since 1992. He is author of *Peoples of the Tundra: Native Siberians in the Post-Communist Transition* (Waveland, 2002), numerous peer-reviewed journal articles, and is co-editor of *The Polar Census of 1926/27 in the European North (Arkhangel’sk Guberniia and Komi Autonomous Province)* (MPSS, 2010).