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Activity Patterns And Perceptions Of Goods, Services, And Eco-Cultural Attributes By Ethnicity And Gender For Native Americans And Caucasians

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Abstract

Managing ecosystems requires understanding how people use and value them. The objective of this study was to examine gender differences in resource use and perceptions of environmental quality in Native Americans and Caucasians interviewed at an Indian festival in East-central Idaho. More men than women engaged in consumptive activities, but there were no differences for non-consumptive or religious/spiritual. More Caucasian males engaged in hunting, and more females engaged in collecting herb and, berries, and bird-watching. More Native American males engaged in hunting and fishing, and more females engaged in picnics and walking/running. Women had higher rates of hike, walk and bike than did men, and there were no ethnic differences. The data indicate that both the percent participation and the frequency of participation varied both ethnically and by gender.

Keywords: consumptive; non-consumptive; eco-cultural; resource use

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Introduction

Protecting ecosystems, and ensuing they continue to provide goods, services and functions is an important aspect of management, regulation, and public policy. Managing natural environment, and protecting both ecological health and human health requires not only understanding the structure and function of ecosystems, but understanding how people use and value those environments. For decades ecologists have focused on examining the structure and functioning of natural ecosystems, and only recently have they added human dimensions to these studies, recognizing that ecosystems provide goods, services, and eco-cultural attributes for humans that lead directly to ecosystem protection and management (Burger et al. 2008; deGroot et al. 2002). Just as environmental assessment is essential to wise ecosystem management, so is the assessment of perceptions and resource use by people (Slocombe, 1993), particularly where multiple land uses are concerned (Yin & Pierce, 1993), where men and women may use the resource differently, where ethnicity affects land use (Floyd et al. 1994; Harris & Harper, 2000; Toth & Brown, 1997), or a combination of these. Where managers are required to make decisions about management, restoration, current uses, or future land use, understanding attitudes about environmental features is essential (Lowrie & Greenberg, 1997), as well as understanding exposure (Harper & Harris, 2008).

While environmental resource use by Native Americans has been studied, often within the context of risk from exposure to chemicals through consumption of wild herbs, fish and game or exposure through excessive time spent on contaminated lands (Harris 2000, 2008; Harris & Harper 1997, 2000; Nez Perce, 2003; Stumpff, 2006), little attention has been devoted to understanding gender differences in resource use or perceptions of resources by Native Americans. Further, ethnic differences reported in the literature for resource use or perceptions have seldom been examined for Native Americans and others living in the same region who might be expected to share common values about the land (Burger, 1999a, 2004b). Generally Native Americans use natural resources more often than others, especially those they consume, providing the opportunities for unacceptable exposure if resources are contaminated.

This study examines gender-related differences in Caucasians, and Native Americans interviewed at an Indian festival in East Central Idaho concerning rates of participation in a

number of different outdoor activities, the frequency of such participation, and attitudes and perceptions about the qualities of their preferred locations for these activities. Consumptive, non-consumptive and religious/cultural activities were examined because men and women engage in both, and there may be gender-related differences.

Gender-related beliefs affect perceptions and behavior (Humpel et al. 2004), which in turn affect several aspects of how society behaves, uses environmental resources, and manages these ecosystems (Bengoechea et al. 2005; McGinnis et al. 2003). Although in some cases, the effects of ethnicity and gender cannot be separated (Floyd et al. 1994), in others there are clear gender differences reflected in different ethnic groups (Burger, 1999b, 2000). Again, males usually engage in higher rates of outdoor activities than females. Although ethnic and gender differences have been reported, most studies have not examined these factors in the same population for the same region. Theoretically, identifying and separating differences is only possible under the above conditions.

Methodology

Sample

Gender-related differences in activity rates and perceptions of consumptive, non-consumptive and eco-cultural activities were examined for people (N=375) who attended the 2009 Shoshone-Bannock Pow Wow (= Indian festival) and Rodeo at Fort Hall, Idaho (Fig. 1). This event was selected because both Native Americans and Caucasians would be present, equal number of men and women were expected, the several day event attracted sufficient people to interview, and the event was attended by a cross-section of people and not just people interested in the outdoors. Characteristics of the study population are presented in Table 1.

Process

Structured interviews employing a questionnaire were used to assess resource uses, perceptions about the features of the environment that were important, and resource activity rates (by consumptive, non-consumptive uses, and religious/cultural). The questionnaire is one that was developed over several years to assess activity patterns and perceptions (see Burger 2002, 2004, 2011a; Burger and Gochfeld 2002, 2006; Burger et al. 2002). Early development included both repeat testing and the inclusion of similar questions in different parts of the questionnaire to examine reliability and consistency.

People were interviewed while they watched events or waited in lines for activities to begin, and few people declined to be interviewed. Interviewers first introduced themselves as

from Rutgers University, and explained the overall purpose of the survey as “to understand how people perceive natural resources, how people use and value the environments they prefer, and what factors affects their perceptions and activities”.

A person was randomly selected for the interview, and after completing an interview, the interviewer moved at least 3 m in a line through the grounds to select the next prospective interviewee. In some cases interviewers moved along a waiting line in this manner, and in other cases they moved through the crowd. Interviews were not attempted when major dance events or rodeo events were occurring, and were sensitive to the activities people were engaged in. Subjects were not selected completely randomly, but there is no reason to assume a bias in our selection process. The interviews typically required about 20 – 40 min, depending upon how many questions subjects asked about the survey or natural resources. Most people were interested in the survey, and asked how they could find out the results.

Questionnaire

The questionnaire was divided into sections that included ranking 8 activities from one to eight, given the frequency of each activity (#/month), and rating the importance of environmental features by consumptive and non-consumptive activities, and frequency and relative importance of various activities, demographic information (age, gender, education, family income, self-identified ethnicity, and self-identified tribal affiliation). The questionnaire had three classes of activities and perceptions (consumptive, non-consumptive, religious/spiritual), and interviewers alternated the order in which they asked these questions.

Respondents were asked whether they hunted, fished, crabbed, gathered herbs or berries, or engaged in other consumptive activities, whether they hiked or camped (or other non-consumptive activities), and whether they engaged in religious/cultural activities. They were then asked to rate the importance of different environmental features of the habitats where they like to conduct these activities on a Likert scale of 1 (unimportant) to 5 (very important). Subjects were also asked to rate the same characteristics for non-consumptive activities, such as hiking, bird watching, biking, camping, picnicking and others, and about religious/cultural activities. The full list can be found in the figures. Although many other features could have been included, the list was refined to reduce the total time for the interviews. Further the results reflect views of the people interviewed, and not of all Native Americans or Caucasians.

Kruskal-Wallis non-parametric one way analysis of variance χ^2 tests were used to distinguish differences among Caucasians and Native Americans and men and women (SAS, 1995). $P < 0.05$ was accepted as significant. Means and standard errors are provided in the text and figures.

Results

There were no gender differences in the age or income distribution of either Native American or Caucasian subjects (Table 1). However, Native Americans were generally younger, had less education, and had lower incomes than Caucasians

Table 1. *Demographics of study population in Fort Hall, Idaho (2009). Given are the means ± standard error and range for age and income (N=375). NS= not significant.*

	Caucasian					Native American				
	Female (n=46)		Male (n=61)		X^2	Female (n=141)		Male (n=127)		X^2
Age	49.3 ± 1.9	26-78	49.4 ± 2.1	20-83	0.01 (NS)	41.5 ± 1.22	18-86	42.9 ± 1.3	18-80	0.8 (NS)
Education										
Less than high school	7%		5%		4.6 (NS)	12%		20%		8.7 (0.07)
High school graduate	24%		36%			34%		35%		
Some college	20%		10%			11%		17%		
College graduate	41%		46%			39%		24%		
Graduate level education	9%		3%			4%		4%		
Income (thousands of dollars)	55.3 ± 7	8-160	43.0 ± 4.6	2-160	2.2 (NS)	37.8 ± 2.7	6-124	36.0 ± 2.9	8-175	0.2 (NS)
% household income below mean ($40,800)	65%		75%			78%		77%		

Activity Rates

There were significant gender differences in the percentage of Native Americans and Caucasians that engaged in consumptive activities, but there were no gender differences for non-consumptive or religious/cultural activities (Table 2). A significantly higher percentage of Caucasian men hunted, although a higher percentage of women gathered hers and berries and bird-watched. For Native Americans, significantly more men than women hunted and fished, but significantly more women gathered herbs and berries, bird-watched and walked or ran than did men. Ethnic differences in religious/cultural activities were not as large (Table 2).

Table 2. Percent of Native Americans and Caucasians that use natural areas for consumptive, non-consumptive, and spiritual activities. Survey conducted at For Hall, Idaho in 2009. NS=not significant

	Caucasian			Native American		
Consumptive	Female	Male	X^2	Female	Male	X^2
Fish	48%	64%	2.8 (NS)	55%	74%	9.8 (0.002)
Hunt	26%	56%	9.4 (0.002)	36%	62%	17.9 (<0.0001)
Gather herbs or berries	20%	5%	5.7 (0.02)	36%	30%	1.3 (NS)
Crab	4%	10%	1.1 (NS)	10%	10%	0.02 (NS)
Do any consumptive activity	59%	79%	5.0 (0.03)	68%	87%	13.6 (0.0002)
Non-consumptive						
Camp	60%	56%	0.1 (NS)	63%	62%	0.02 (NS)
Hike	67%	62%	0.3 (NS)	47%	54%	1.4 (NS)
Picnic	56%	38%	3.0 (NS)	59%	34%	16.1 (<0.0001)
Bird watch	53%	27%	7.1 (0.008)	18%	19%	0.007 (NS)
Bike	38%	49%	1.2 (NS)	26%	31%	0.8 (NS)
Walk / Run	20%	9%	2.8 (0.09)	30%	7%	21.5 (<0.0001)
Vision Quest	11%	11%	0.001 (NS)	9%	16%	3.7 (0.05)
Do any non-consumptive activity	91%	79%	2.9 (NS)	89%	89%	0.04 (NS)
Spiritual						
Church	52%	55%	0.1 (NS)	30%	20%	3.5 (0.06)
Sacred ground	2%	7%	1.25 (NS)	32%	37%	0.9 (NS)
Synagogue	0%	2%	0.8 (NS)	0%	0%	---
Temple	2%	2%	0.03 (0.008)	2%	0%	2.7 (NS)
Other Spiritual Place	9%	3%	1.3 (NS)	27%	29%	0.2 (NS)
Any Spiritual Place	65%	64%	0.03 (NS)	81%	81%	0.01 (NS)

For the people who engaged in different activities, there were few significant gender differences, although both Native American and Caucasian women had higher frequencies of hiking, walking and biking than men (Table 3). In addition, female Native Americans bird-watched at higher mean frequencies than did males.

Table 3. Activity frequency for Fort Hall subjects. Mean number of times per month respondents participate in activities (for those who do the activity). Given are means ± standard error and Kruskal-Wallis X2 (p). NS = not significant.

	Caucasian							Native American						
	n	Female			**n**	Male		X^2	**n**	Female			**n**	Male		X^2
How many times a month activity is done in natural area:																
Commune with nature	28	21.0	±	2.25	29	15.3	± 2.22	2.6 (NS)	97	21.9	±	1.05	78	22.1	± 1.25	0.1 (NS)
Hike, walk, or Bike	33	18.4	±	2.32	37	9.8	± 1.70	9.5 (0.002)	87	17.5	±	1.28	65	10.4	± 1.19	10.7 (0.001)
Pray or meditate	25	16.9	±	2.60	17	14.5	± 2.83	0.2 (NS)	89	23.5	±	1.68	78	22.6	± 1.28	0.3 (NS)
Bird-watch	22	16.5	±	2.78	16	12.1	± 3.24	1.7 (NS)	37	21.2	±	2.01	32	13.3	± 2.15	5.6 (0.02)
Other (name it)[a]	10	9.6	±	3.78	7	11.7	± 3.89	0.9 (NS)	26	6.9	±	1.90	31	4.7	± 0.94	0.03 (NS)
Picnic or feast	27	7.1	±	1.67	28	4.2	± 0.83	2.8 (NS)	93	7.3	±	0.87	72	5.6	± 0.80	2.1 (NS)
Fish, crab, or hunt	17	3.3	±	0.67	40	5.3	± 0.61	3.5 (0.06)	69	4.6	±	0.76	83	5.0	± 0.59	2.4 (NS)
Collect herbs, berries, etc	9	1.5	±	0.40	13	2.6	± 0.92	0.8 (NS)	56	4.8	±	0.94	45	2.4	± 0.38	0.9 (NS)
Vision quest or other ceremony	1	0.1			2	1.5	± 0.50	1.5 (NS)	16	5.5	±	2.43	21	4.8	± 1.95	0.1 (NS)

a. This includes camping, horseback riding, sweat lodge, pow wow, swimming, shooting, rodeo, and sports.

Evaluations

One of the objectives was to examine gender-related differences in evaluations of environmental characteristics for the different activity types (consumptive, non-consumptive, religious/cultural, Fig. 2-4). Native Americans exhibited few gender related differences (except for lack of people), but Caucasian males rated butterflies and flowers less highly, and lack of people more highly, than did women (Fig. 2).

There were no significant gender differences for Native Americans consumptive places (Fig. 3), but Caucasian women rated several characteristics as more important than Caucasian men (e.g. lack of radionuclides in soil or groundwater, unpolluted water and soil, butterflies and flower, and complexity of nature, although men valued few or no roads more highly.

The greatest gender differences for Caucasians was for religious/cultural places. Women rated nearly characteristics as more important than did men (Fig. 4). Distance from home was the only environmental characteristic that did not differ significantly by gender.

Discussion and Conclusion

Gender-related Differences in Activity Levels

To understand both how people use environmental resources, and to determine possible exposure routes for contaminated sites, it is essential to understand activity rates. Activity rates were used because such activities can be for recreation, for subsistence, for cultural or traditional reasons, or for a combination of these. Thus it is less value laden to avoid using recreational or subsistence.

The second problem with examining activities is that activities are often not discrete units (Burger, 1999b). That is, a person could be hunting, hiking, and camping as part of the same trip, and if it is a camping trip, they might hunt, fish, and gather herbs and berries, hike to the sites, and spend some time walking between or during activities. Further, these activities are often part of a Native American traditional lifestyle, where separation is difficult (Harper et al. 2008). Therefore, we computed both the percent of people who said they participated in each activity, but then computed the percent of people who engaged in any consumptive activity. This provides a more complete picture of the extent of consumptive activities performed, which might be needed both for wildlife and recreational management, for determining Tribal needs, and for assessing exposure.

Traditionally, one might expect there to be gender-related differences in consumptive activities, such as hunting and fishing, as has been found for recreational, leisure-related, and

subsistence/cultural types (Burger, 1999b; McGinnis et al. 2003). An alternative hypothesis is that, based on interest group theory (Floyd et al. 1994), people living in an area with unlimited opportunities for outdoor activities (as occurs in Idaho), might all engage in outdoor activities, regardless of gender. The data from this paper show that although there were gender differences for both Caucasians and Native Americans for overall consumptive activities (including hunting for both groups), there were no gender differences for non-consumptive and religious/cultural activities. This may indicate that more men are still hunting and fishing than women, but the rates are not as different as might be expected. That is, for those who engage in an activity, men and women do so at the same rates. It may be that many of the activities are done in mixed-gender pairs or groups, which might account for the similar rates. That is, if a Native American family goes on hunting and fishing trip, they do so together and have equal hunting and fishing rates.

Exceptions are particularly interesting. Women had higher rates of hike, walk or bike than did men, for both Caucasian and for Native American men. This may relate to the tendency for women to walk or hike for exercise, and to do so on a regular basis (Floyd et al. 1994). Otherwise, the rates of activity (for those who did them) were relatively similar for men and women. We had expected that rates of gathering herbs and berries might differ by gender, but although the participation varied significantly, the rates did not. Men and women who engaged in gathering did so at similar rates, and perhaps did so together.

Evaluations

Understanding how people value ecological resources and how often they use these resources is critical to wildlife management, conservation, recreational and leisure sciences, risk assessment, and remediation restoration. While evaluation of wildlife in terms of the cost of a given species (to replace) and how people value wildlife aesthetically is an important discipline (Costanza, 1993; Costanza et al. 1997; Efroymson et al. 2008; Nielsen et al. 2007), other characteristics of the ecosystem itself are often ignored. Contingent valuation is used for the former (Chambers & Whitehead, 2003; Diamond & Hausman, 1994; Mitchell & Carson, 1989), while examining preferences for the latter is an approach often used (Martinez-Espineira, 2006). Knowing resource use, recreational rates, and how much people value particular characteristics of the environments and habitats they prefer is an important aspect of environmental management, risk assessment, and public policy development.

This paper evaluated the importance of a number of environmental characteristics to places where people performed consumptive, non-consumptive, or religious/cultural activities.

The results reflect the participants in the survey. While there were differences in evaluations depending upon the characteristic and ethnicity (see Fig. 2-4), there were few gender differences, except for religious/cultural sites. For these sites, and indeed for characteristics where there were gender differences for consumptive and non-consumptive activities, female Caucasians rated the characteristics as more important. Male Caucasians did not evaluate any environmental characteristic as more important than females for religious/cultural places. This difference did not exist for Native Americans (where the evaluations were remarkably similar, with very little variation around the mean).

This difference in Caucasians is no doubt real for two reasons: 1) these differences did not exist for the other categories (consumptive, non-consumptive), and 2) the differences existed for every environmental characteristic. The reasons for this finding are unclear, unless Caucasian women equate religious/cultural activities as being more in nature than do Caucasian men.

The data in this study indicate that although there are gender differences in overall participation rates for consumptive activities for Native Americans and Caucasians, there are no differences in overall rates of participation in non-consumptive and religious activities. When individual activities are examined there are some gender differences in hunting, fishing and gathering herbs, but few consistencies. The rate of participation in all three types of activities is rather high (over 80 % for all except female Native Americans for consumptive activities). Thus, in this region of the country, the outdoors serves a very important role for both Native Americans and Caucasians, and for both men and women. Further, and surprisingly, there were not many differences in the activity rates of men and women for those that participate. The lack of a gender difference in participation is not as surprising for Native Americans, whose culture is bound with natural resources (Harper et al. 2008), but may be more surprising for Caucasians. Evaluations were also remarkably similar for men and women, except for female Caucasians that rated all environmental characteristics more highly than did their male counterparts.

Taken altogether, these data indicate that both the percent participation and the frequency of participation vary both ethnically and by gender, depending upon the activity involved, that men engage in more consumptive activities than women, and that there are few gender differences in valuations by Native Americans of environmental characteristics with respect to the places they conduct activities, but there are gender differences for Caucasians, particularly for religious/cultural activities. The lack of differences in valuations for most aspects of consumptive and non-consumptive activities, coupled with the significant gender differences for Caucasians, suggests that this aspect needs further study. This difference was very consistent, and did not mirror either percent participation differences or activity frequency rates.

These data can be used to understand activity participation and valuations for management of ecosystems, managing provision of recreational and cultural/religious opportunities that involve nature, understanding gender roles, and considerations of risk for contaminated lands. Managers can use the data to focus management actions on providing subsistence and recreational opportunities for the activities that are preferred and preformed most often, while also directing some attention to activities less often or at particular times of the year (e.g. berry-picking). Further, where high, managers may take into account areas of possible construction and manage or restrict access to prevent adverse health effects.

The public, public policy makers, and other support the preservation and conservation of ecosystems partly based on their use and value of those ecosystems. For the subjects interviewed, there was a high level of participation in a wide range of activities involving the outdoors, including consumptive, non-consumptive, and religious/cultural, suggesting overall support for lands that will support this range of activities.

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Figure Legends

1. Map showing the location of the Shoshone-Bannockl Pow Wow and Rodeo at Fort Hall, Idaho.
2. Ratings for Native Americans and Caucasians interviewed at the Shoshone-Bannock Pow Wow and Rodeo as a function of gender for the importance of environmental characteristics about the places they prefer for consumptive activities. Shown are means ± standard errors.
3. Ratings for Native Americans and Caucasians interviewed at the Shoshone-Bannock Pow Wow and Rodeo as a function of gender for the importance of environmental characteristics about the places they prefer for non-consumptive activities. Shown are means ± standard errors.
4. Ratings for Native Americans and Caucasians interviewed at the Shoshone-Bannock Pow Wow and Rodeo as a function of gender for the importance of environmental characteristics about the places they prefer for religious/cultural activities. Shown are means ± standard errors.

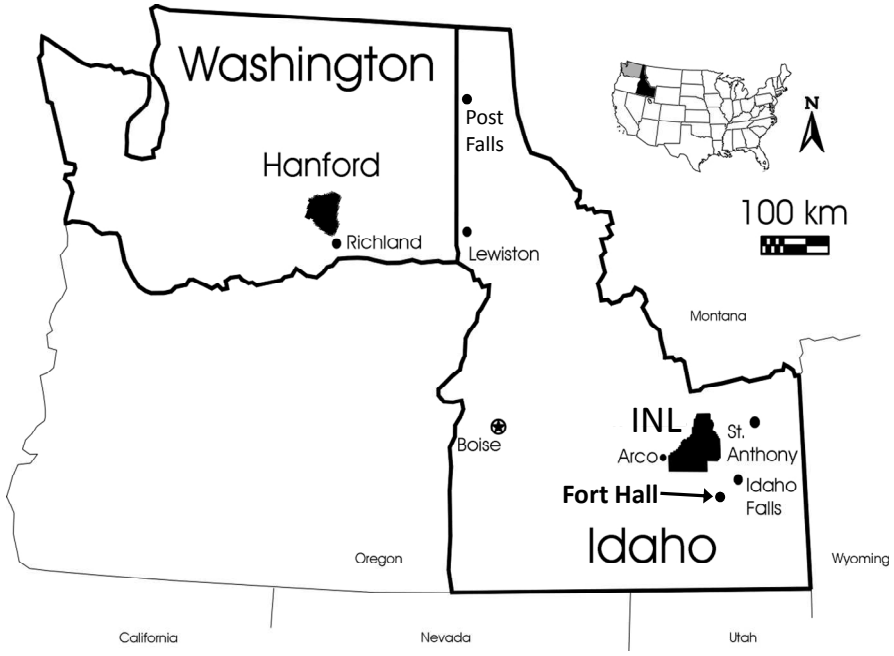

Figure 1

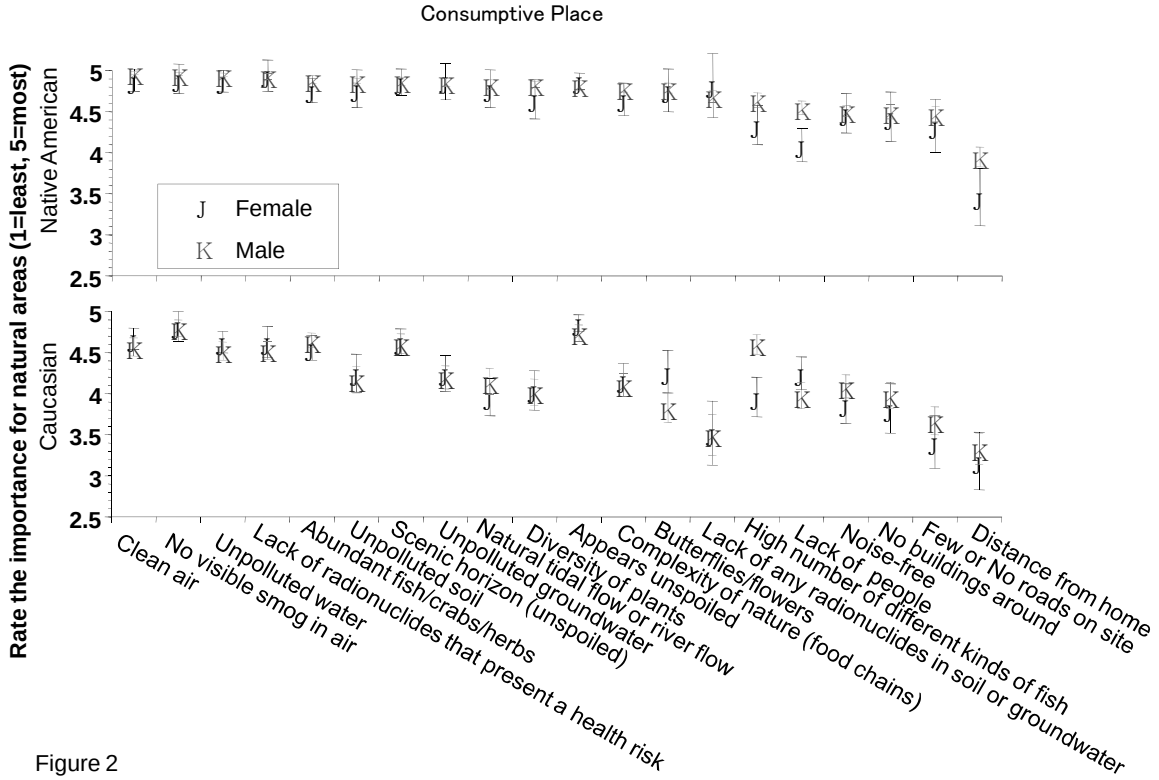

Figure 2

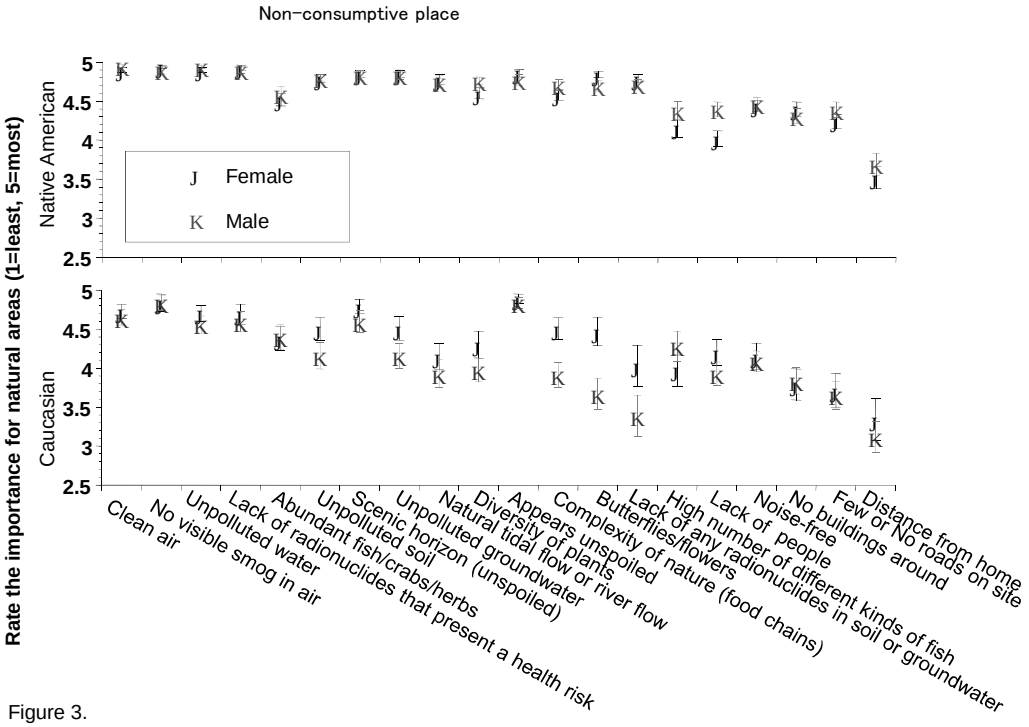

Figure 3.

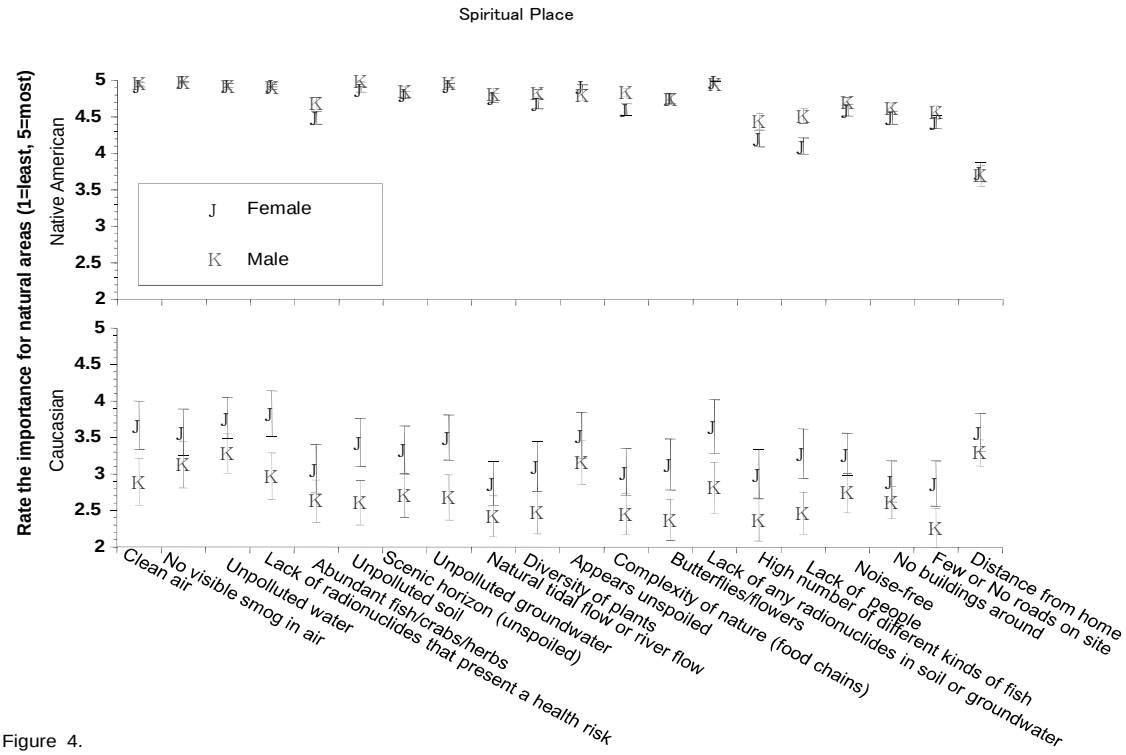

Figure 4.