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Patterns of outdoor recreation activities among Norwegians: an evolutionary approach

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We argue that our ancestors had the nature as their only playground, therefore, the understanding of patterns of present-day outdoor recreation activities has to be considered in relation to this background. We predict that outdoor recreation activities are age and gender specific: men dominate hunting (high-risk) activities and women dominate gathering activities. These predictions are based on different gender and age roles from our evolutionary past. The results support these predictions because younger men were more involved in high-risk outdoor recreation activities as e.g. hang gliding, parachute jumping and mountain climbing, while activities like hunting and fishing were more similarly distributed among men age groups. All hunting/fishing activities were male-dominated, while gathering activities were female-dominated. No age related pattern was found in female-dominated activities. Thus we can use evolutionary theory to predict patterns and attitudes of outdoor recreation activities.

Introduction

The human being has evolved in close contact with nature, but over the last centuries many people moved away from natural surroundings and "adapted" to an urban life. Thus, for many individuals the innate closeness to nature has disappeared. Therefore, in many western societies it is no longer necessary to be close to nature to survive or reproduce. A question arises whether or not our present-day life is in accordance with our basic desires or demands. Is it possible to use the evolutionary theory to predict patterns of human contact with nature in modern societies?

After a long evolution when humans, *Homo sapiens*, were living in close contact with nature and utilised the natural surroundings to survive and reproduce, a dramatic change took place about 10 000 years ago. This dramatic change is often called the agricultural revolution (Jones *et al*. 1992, Diamond 1997). However, before they became agricultural, humans had already used domesticated animals. The domestication of wolfs, *Canis lupus*, into dogs, *C. familiaris*, may have taken place 20 000–100 000 years ago (Vilá *et al*. 1997, Leonard *et al*. 2002, Savolainen *et al*. 2002). Our social habits changed quickly after the agricultural revolution and the oldest cities are about 6000 years old. With the industrial revolution about 250 years ago, high technology created a new culture where nature could be utilised or encroached in a much more efficient way. The most important difference between natural and cultural evolution is the

way and the speed the change occurs (Dawkins 1982, 1986); therefore, cultural habits changed very quickly over the last centuries, without the genotype catching up. Considering the past natural evolution of human beings the last cultural explosion has occurred for only micro-parts of our evolutionary history, and has therefore not changed our genotypes.

As a species *Homo sapiens* has evolved to exploit their natural resources and to compete with other individuals or family groups for access to such resources (Heinen & Low 1992, Low & Heinen 1993, Low 1996). Humans have evolved to respond to short term benefits that have immediate consequences for ourselves, our relatives or our closest friends (Low & Heinen 1993, Low 1996). In no species, and certainly not in humans, have individuals evolved to care for the group or unrelated individuals, except in cases where they have had direct benefits of doing so (Williams 1966, Axelrod 1984). Our species has evolved to think and act to maximise short term benefits, which again have affected reproductive success (Low & Heinen 1993). Those individuals with better access to resources had a higher reproductive success (Betzig *et al.* 1988, Røskaft *et al.* 1992), a higher social status, and were often good hunters or warriors (Chagnon 1988, 1997, Low 2000). Over evolutionary time, therefore, being good hunters, warriors, or having access to resources were frequently related to high social status (Kaplan & Hill 1985b, Borgerhoff Mulder 1990, Low 1992, 2000). Among different taxa, frequently the males with highest social status, those with the best territories, or those who are the best fighters have the highest reproductive success (e.g., Beebe 1947, Lack 1968, Dewsbury 1982, Packer & Pusey 1982, 1983, Cowlishaw & Dunbar 1991, Ellis 1993, Packer *et al.* 1995).

Because humans have evolved in nature, closeness to nature has always been essential for our well-being (Hågvar & Støen 1996). Evolutionary studies have given support for certain habitat preferences of modern people from different cultures (MacArthur & Pianka 1966, Levins 1968, Rosenzweig 1974, 1981, Charnov 1976, Orians 1980, 1986, Cody 1985). Modern human beings seem to have a preference for savannah-like habitats (Balling & Falk 1982, Ulrich 1983, 1986). Modern humans often spend a substantial amount of time in nature engaged in different recreation activities such as hunting, fishing, berry and mushroom picking, hiking, skiing etc. Such activities are frequently called "outdoor recreation activities" (Kaltenborn 1993). In Scandinavia such activities are very popular. Studies on outdoor recreation activities are multidisciplinary and have been based on social scientific methodology and theory (Kaltenborn & Vorkinn 1993). So far, research has largely been devoted to finding out which groups of the society participate in outdoor recreation activities (Burch 1966, Kelly 1992). However, motivations, attitudes and satisfactions (Ajzen & Fishbein 1980, Iso-Ahola 1980, Kleiven 1992), as well as spatial patterns of activities in relation to different environments have also been important research topics (Aldskogius 1977, Smith 1983, Pearce 1990).

Throughout our evolutionary past and in modern hunter-gatherer societies, men and women have had different roles in their daily activities, men typically being hunters and females gatherers (Kaplan 1996). Men have been fighting in wars and participating in more high-risk activities than women. These different roles are reflected in higher mortality rates among males (Chagnon 1988, 1997, Low 2000, Hill *et al.* 2001). Because young men are normally on the mating market, and heroism often gives higher social status and thereby easier access to potential wives (Chagnon 1988, Low 2000), young men frequently take higher risks than do older men (Hill *et al.* 1997). Modern tools or playgrounds do not change the risk-taking patterns of young men. Today, they are faced with several high-risk activities they are not evolved to handle, therefore young men may suffer higher mortality by participating in such activities (Kellert & Wilson 1993). This is for instance reflected in the fact that younger men more often are killed or injured in car and motorcycle accidents and they are also more often involved in disputes leading to homicide (Daly & Wilson 1997, McGwin & Brown 1999). Women, on the other hand, do not change their risk-taking behaviour with age, because they are primarily the choosing sex (Chagnon 1988, 1992, Low 2000).

The aim of the present paper is to study human outdoor recreation activities. We argue that the use of evolutionary theory will help us understand patterns of human use of nature as a recreational area. Through urbanisation humans have developed distance to nature, however, we tend to create natural habitats in our surroundings. The tradition of bringing plants and pets into our houses are examples of behaviour bringing us closer to nature (Heerwagen & Orians 1993). Paintings have often nature motives which is a signal of nature desire (Kaplan & Kaplan 1983). We plant trees and bushes near our roads and in parks, and people spend a lot of money to make lovely gardens. The attractiveness of a neighbourhood is often graded in relation to how many trees, bushes and flowers there are (Kaplan & Kaplan 1983). We, therefore, argue that the demand for using nature for outdoor recreation activities is simply based on our evolved feature to do so.

We argue that patterns of outdoor recreation activities among Norwegians and types of activities are age and gender specific, based on different gender and age roles throughout our evolutionary past. We predict that (1) high-risk activities will be young-male-dominated, (2) hunting activities are male-dominated, and (3) gatherer activities are female-dominated. We will also discuss these patterns in the light of social status, income and educational level.

Material and methods

Two Norwegian opinion-research institutes Scan-Fact and Markeds-og Mediainstituttet (MMI — a leading centre of competence in consumer insight and market research) collected the data used in the present paper through two independent questionnaire surveys. In both surveys, however, the surveyor interviewed people directly (face to face). One survey was contracted by the Institute for Applied Social Science (FAFO), and the other the main organisation for outdoor activities (Friluftslivets Fellesorganisasjon (FRIFO)) (Dølvik *et al*. 1987, Danielsen 1989, Ugland 1989). The first data set was collected in autumn 1987 and a representative sample of the Norwegian population (2400 people between 16 and 69 years of age) was interviewed. We accessed the database through The Norwegian Social Science Data Service (NSD) where the data were accessible for public use and research purposes. The second survey was done in 1993 (Vaagbø 1993, Kleiven 1994) and based on the same criteria as the first one. This database consists of 1079 questionnaires from persons over 15 years of age. We accessed the data via the Norwegian Institute of Nature Research (NINA) with permission from FRIFO. In the further analyses we refer to the first database as FAFO and to the second as FRIFO.

The data were distributed and weighted for different geographical areas in Norway. Furthermore they were weighted to balance gender and age groups, i.e. by having comparable numbers of men and women, as well as similar numbers in each age group. The types of outdoor recreation activities were selected by the institutions that collected the data.

The respondents had to report how frequently they had been involved in different outdoor recreation activities during the last 12 months (scale: 1 = not involved, 2 = 1–2 times, 3 = 3–9 times, 4 = 10–39 times, 5 = more than 40 times). For the infrequently used activities (*see* Table 1) we used only a two-activity scale: 1 = not involved in this activity, 2 = involved in this activity.

As a general nature contact index, we used the variable "How frequently did you go for shorter or longer hikes in forests or mountains last year?" This is the most frequent outdoor recreation activity of Norwegians and 78% and 79% of the FAFO/FRIFO respondents, respectively, had been involved in this kind of activities during the last year (Table 1). Each person, therefore, received a score between 1 and 5 for this nature contact index as described above.

The other outdoor recreation activities were divided into nine activity groups as described by Aasetre *et al*. (1994): 1 = fishing; (a = in sea water, b = in freshwater, c = for salmon or trout), 2 = hunting (a = small game, b = large game), 3 = picking berries/mushrooms, 4 = skiing, 5 = sailing, 6 = kayaking/canoeing, 7 = sea diving, 8 = mountain climbing, 9 = hang gliding or parachute jumping. The FRIFO survey was more detailed than the FAFO one, because they separated both fishing and hunting activities into

subgroups (*see* Table 1). Activities 1–3 were tested in relation to the predictions regarding sex roles, while activities 4–6 were considered neutral activities. We defined activities 7–9 as high-risk activities (Breivik 1996, Breivik *et al.* 1998, Hansen & Breivik 2001).

House standard was described slightly differently between the two surveys, so we divided standard of houses into three groups: 1 = private (detached) houses, 2 = not detached houses, and 3 = block of flats (apartment building) or single rooms. In the FAFO survey, there were four income levels: 1 = 0–99 000 NOK, 2 = 100 000 –199 000 NOK, 3 = 200 000–299 000 NOK, 4 = > 300 000 NOK; while FRIFO had three income levels: 1 = 0–100 000 NOK, 2 = 101 000–200 000 NOK, 3 = > 200 000 NOK. Education level had four categories: 1 = primary school, 2 = secondary school, including more practical oriented schooling, 3 = high school (FRIFO) or university less than three years (FAFO), 4 = university more than three years (FAFO), or university (FRIFO).

We analyzed the data with respect to sex (men, women). For men we also used two age groups (< 30 years of age, and ≥ 30 years of age). The age of 30 was chosen to differ mature men from younger risk-takers because the average age of marriage for Norwegian men is close to 30 (Røskaft *et al.* 1992). If high-risk activities are related to mate choice, men should therefore take higher risks before they marry. In Univariate GLM analyses we used, however, real age to reveal the relative importance of age in relation to sex.

The data were analyzed with SPSS version 11.0, normally with non-parametric tests because the data were not normally distributed. Since the directions of our results were predicted beforehand we could have used one-tailed tests in our analyses. We, however, chose to use two-tailed tests. We decided not to use Bonferroni corrections to reduce the level of significance because our tests were normally highly significant and because we used two independent data sets.

Table 1. The proportion of respondents that participated in different outdoor recreation activities in the two data samples used in this study (FAFO, *N* = 2400; and FRIFO, *N* = 1079).

Activity	FAFO Freq. (%)	FRIFO Freq. (%)
Hiking occasions	78	79
Picking berries or mushrooms		45
Fishing	49	
in sea water		45
in freshwater		27
salmon or trout		20
Hunting	9	
small game		3
large game		6
Skiing	65	44
Sailing	7	5
Kayaking/canoeing	6	9
Sea diving	3	2
Mountain climbing	1	1
Hang gliding or parachute jumping	0.4	

Results

Outdoor recreation activities in relation to socio-economic factors

There was a positive significant relationship between the nature contact index and the house standard. People living in the highest quality houses had a higher nature contact (Kruskal-Wallis one-way ANOVA: FAFO $\chi^2_2 = 13.6$, $p < 0.001$; FRIFO $\chi^2_2 = 6.03$, $p = 0.049$; Fig. 1A). Furthermore, people with the highest annual income also spent more time in nature (Kruskal-Wallis one-way ANOVA: FAFO $\chi^2_3 = 51.4$, $p < 0.001$; FRIFO $\chi^2_2 = 20.4$, $p < 0.001$; Fig. 1B). Finally, those with highest education spent more time in nature (Kruskal-Wallis one-way ANOVA: FAFO $\chi^2_3 = 96.7$, $p < 0.001$; FRIFO $\chi^2_3 = 40.7$, $p < 0.001$; Fig. 1C).

Outdoor recreation activities in relation to gender

Men more than women tended to participate in high-risk activities as sea diving (FAFO 4.4% men, 1.1% women, $\chi^2_1 = 24.9$, $p < 0.001$; FRIFO 4.0% men, 1.2% women, $\chi^2_1 = 8.28$, $p = 0.004$), hang gliding and parachute jumping (FAFO 0.8% men, 0.1% women, $\chi^2_1 = 5.62$, $p = 0.010$; FRIFO no data). However, there was no statis-

tically significant difference between the two sexes in mountain climbing (FAFO 1.4% men, 0.8% women, $\chi^2_1 = 2.0$, $p = 0.157$; FRIFO 1.2% men, 0.8% women, $\chi^2_1 = 0.49$, $p = 0.483$).

Activities such as sailing and canoeing/kayaking tended to be more men-dominated although not always statistically significantly so (FAFO sailing 9.9% men, 3.9% women, $\chi^2_1 = 40.0$, $p < 0.001$; canoeing/kayaking 8.0% men, 5.1% women, $\chi^2_1 = 8.4$, $p = 0.004$; FRIFO sailing 5.6% men, 3.8% women, $\chi^2_1 = 1.86$, $p = 0.172$; canoeing/kayaking 11.0% men, 8.2% women, $\chi^2_1 = 2.25$, $p = 0.134$). Men did, however, more often than women participate in skiing activities but the difference was statistically significant only for the FAFO sample (FAFO 68.9% men, 59.5% women, $\chi^2_4 = 36.2$, $p < 0.001$; FRIFO 47.0% men, 39.7% women, $\chi^2_4 = 8.59$, $p = 0.072$).

Statistically significantly more men than women were involved in hunting activities (FAFO 16.4% men, 2.2% women, $\chi^2_4 = 142.0$, $p < 0.001$; FRIFO large game 6.2% men, 1.1% women, $\chi^2_1 = 18.7$, $p < 0.001$; small game 11.4% men, 1.7% women, $\chi^2_1 = 39.7$, $p < 0.001$). The same statistically significant differences were also found for fishing activities (FAFO 72.7% men, 37.8% women, $\chi^2_4 = 205.0$, $p < 0.001$; FRIFO sea fishing 56.4% men, 36.5% women, $\chi^2_1 = 40.8$, $p < 0.001$; freshwater fishing 37.1% men, 17.4% women, $\chi^2_1 = 50.1$, $p < 0.001$; fishing for salmon and trout 27.5% men, 13.4% women, $\chi^2_1 = 31.5$, $p < 0.001$).

Women participated statistically significantly more frequently in picking berries/mushrooms than did men (FRIFO 49.9% men, 61.6% women, $\chi^2_4 = 18.6$, $p = 0.001$; FAFO no data). However, there was no difference in this activity between women above 30 and those under that age (FRIFO $\chi^2_4 = 5.36$, $p = 0.252$; FAFO no data).

Outdoor recreation activities in relation to age among men

Younger men more often than older tended to participate in high-risk activities such as sea diving (FAFO 1.7% old men, 10.9% young men, $\chi^2_1 = 49.0$, $p < 0.001$; FRIFO 2.3% old men, 8.1% young men, $\chi^2_1 = 9.13$, $p = 0.003$), hang gliding and parachute jumping, although the difference was not statistically significant (FAFO 0.5% old men, 1.4% young men, $\chi^2_1 = 2.89$, $p = 0.089$; FRIFO no data). Young men were also more active than old ones in mountain climbing (FAFO 1.0% old men, 2.6% young men, $\chi^2_1 = 4.48$, $p = 0.034$; FRIFO 0.6% old men, 2.7% young men, $\chi^2_1 = 3.96$, $p = 0.047$).

Young men participated in activities like sailing more than older ones. Furthermore, canoeing and kayaking tended to be more young men-dominated (FAFO sailing, 5.0% old men, 21.8% young men, $\chi^2_1 = 77.1$, $p < 0.001$; canoe-

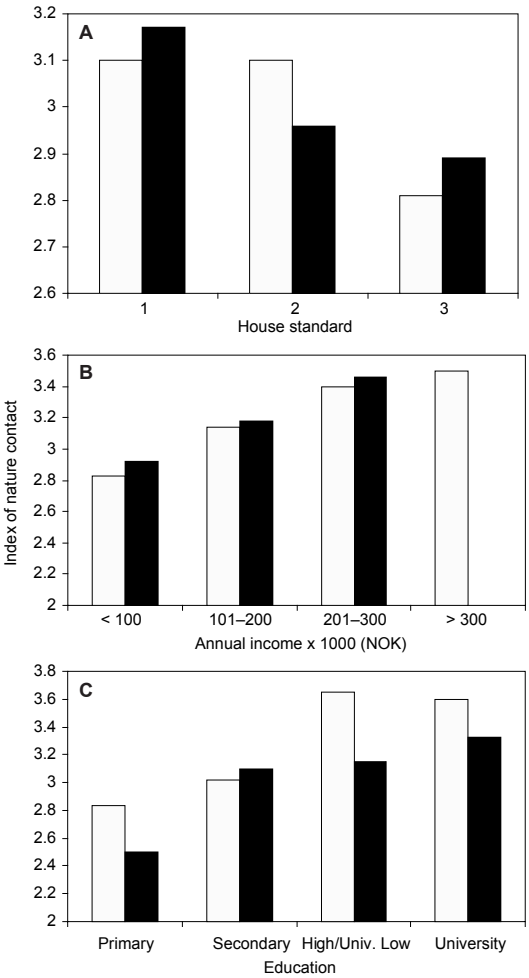

Fig. 1. The relation between index of nature contact and (**A**) house standard (1 = private (detached) houses; 2 = not detached houses; 3 = block of flats (apartment building) or single rooms); (**B**) Annual income level; and (**C**) level of education, for the two surveys (FRIFO = black bars, FAFO = white bars).

ing/kayaking, 5.0% old men, 15.2% young men, $\chi^2_1 = 34.8$, $p < 0.001$; FRIFO sailing, 1.7% old men, 14.9% young men, $\chi^2_1 = 33.4$, $p < 0.001$; canoeing/kayaking, 8.3% old men, 17.4% young men, $\chi^2_1 = 9.02$, $p = 0.003$). Finally, young men did not participate in skiing significantly more often than old men (FAFO $\chi^2_4 = 2.28$, $p = 0.684$; FRIFO $\chi^2_4 = 4.73$, $p = 0.316$).

There was no statistically significant difference between the two age groups in hunting activities (FAFO $\chi^2_4 = 5.60$, $p = 0.231$; FRIFO large game, $\chi^2_1 = 1.62$, $p = 0.203$; small game, $\chi^2_1 = 0.002$, $p = 0.969$). However, young men more often than old ones participated in fishing activities, but the difference was not always statistically significant (FAFO 60.2% old men, 68.2% young men, $\chi^2_4 = 19.7$, $p < 0.001$; FRIFO sea fishing, $\chi^2_1 = 1.18$, $p = 0.278$; freshwater fishing, 33.2% old men, 46.3% young men, $\chi^2_1 = 7.54$, $p = 0.006$; fishing after salmon and trout, 24.3% old men, 34.9% young men, $\chi^2_1 = 5.91$, $p = 0.015$).

Interactions between gender and age

In order to test the relative importance of gender and age in the variation of outdoor recreation activities we performed Univariate GLM tests (Table 2). Gender turned out to be insignificant for two of the three high-risk outdoor recreation activities (Table 2), thus gender lost its power when explaining variation in hang gliding/parachute jumping activities. For the other two activities, the GLM tests basically confirmed the previous analyses. Age was significant in explaining variation in sea diving, but not for the others, thus it had lost its power in explaining variation in mountain climbing activities. The interaction between age and gender was never statistically significant, indicating that women's age had no significant effect.

The results of the Univariate GLM analyses also basically confirmed the previous tests, for skiing, sailing and kayaking/canoeing activities. Both gender and age turned out to be significant in explaining variation in skiing activities, adding age as a significant variable. This was due to the fact that younger women (under 50 years of age) more than older ones (above 50 years of age) participated in this activity, although the interaction between age and sex was not significant (Table 2). Gender was significant in explaining the variance in sailing activities in the FAFO sample while age was significant in the FRIFO sample. For kayaking/canoeing gender lost its power in the FAFO sample, but remained insignificant in the FRIFO sample (Table 2). The interaction between age and sex was not significant in either of the last two activities.

Table 2. The importance of sex, age (real age) and the interaction between sex and age as independent variables of Univariate GLM analyses with outdoor recreation activities as dependent variables. The different activities are described in Table 1. The results are given as *p* values only.

Activity	FAFO			FRIFO		
	p (sex)	*p* (age)	*p* (sex × age)	*p* (sex)	*p* (age)	*P* (sex × age)
Picking berries				0.253	0.018	0.377
Fishing	0.000	0.030	0.475			
sea water				0.000	0.001	0.583
freshwater				0.000	0.577	0.935
salmon and trout				0.000	0.707	0.925
Hunting	0.000	0.398	0.224			
small game				0.000	0.526	0.901
large game				0.000	0.903	0.549
Skiing	0.000	0.000	0.326	0.001	0.009	0.349
Sailing	0.000	0.112	0.112	0.429	0.018	0.992
Kayaking/canoeing	0.148	0.000	0.894	0.373	0.592	0.931
Sea diving	0.008	0.000	0.259	0.070	0.043	0.170
Mountain climbing	0.498	0.511	0.836	0.840	0.996	0.998
Hang gliding/parachute	0.255	0.708	0.279			

Gender turned out to be the most important variable in explaining the variation in hunting and fishing activities, while age was only significant in two out of five tests. The interaction between age and sex was never significant (Table 2). Gender lost its power in explaining the variation in picking berries/mushrooms, while age became a statistically significant variable. This was due to the fact that a statistically significantly higher proportion of old men (46.4%) than young ones (24.3%; $\chi^2_4 = 27.4$, $p < 0.001$) participated in this activity. The interaction between sex and age was never statistically significant.

Discussion

In questionnaire censuses there are two important factors to be considered; (1) the selection of respondents and (2) how the questions are raised (Fowler 1993). In this research, we considered both issues. In the present study, the sample of people used is representative of the Norwegian population. Secondly, people were asked to quantify their levels of different outdoor recreation activities over the last 12 months. Thirdly, data were collected through a standard procedure by recognized research institutes. We made predictions before we started the analyses. People involved in the data collection were unaware of our predictions. Finally, data were collected in two independent surveys, giving very similar results. Therefore, we conclude that the methods were acceptable although not sufficient for answering all our questions.

We have shown that we were able to predict patterns in outdoor recreation activities among Norwegians by using evolutionary theory. Men more than women participated in hunting and fishing activities, and young men more than older ones participated in high-risk activities. Women participated more than men in picking berries and mushrooms, although this difference seemed to lose some of its power because older men more than younger ones participated in this activity. The attendance to low-risk activities was in some cases dependent of both gender and age.

Our results further demonstrate a close relationship between education level, total income level, house standard and outdoor recreation activities. These factors are not necessarily independent of each other. Previous studies have shown that they might differ in their relative importance and that they often inter-correlate (Hansen & Ås 1981, Røskaft *et al*. 2003). In the present study, however, we only wanted to test the importance of these three factors, without necessarily testing the interrelation between them with the use of a multivariate analysis. Socio-economic factors, such as type of house, salary and education levels, have been shown to be important in explaining environmental attitudes in humans (Røskaft *et al*. 2003). People with higher education and higher incomes are normally more positive towards environmental issues and conserving nature than people of lower education or income levels (Røskaft *et al*. 2003). This might be related to the fact that these people absorb more information and/or that such positive attitudes are linked to social status. Using the nature for recreation activities is, as argued, part of our inheritance (Kaplan & Kaplan 1983). Using the nature for recreation activities will, therefore, help in recovering from daily life stress and reducing mental tiredness (Sjong 1992, Ulrich 1993). There is most probably a close link between status and involvement in outdoor recreation activities in Norway, which may be explained by the fact that people of higher socio-economic levels were more often involved in such activities. However, more research is necessary to further test this hypothesis.

Evolutionary theory is the only theory predicting that social factors as well as information given on the issue of concern might affect people's environmental attitudes. Furthermore, evolutionary theory is the only theory that predicts differences between sex and age groups with regard to different outdoor recreation activities. We predicted that men more than women should participate in hunting and fishing activities, and that women more than men should participate in gathering activities. These sex-role differences were highly significant in both surveys and can be explained by different roles among our ancestors in the evolutionary past. Such sex and age differences are presently found among many cultures where men are hunters and warriors (Kaplan & Hill 1985a, 1985b, Hawkes *et al*. 1991, Bjerke 1993, Hawkes 1993, 1996, Wright

1994) and women are gatherers in the vicinity of their homes (Murdock & Wilson 1972, Murdock & Provost 1973, Wilson 1975, Ridley 1993, Bjerke 1994, Low 2000).

As predicted, high-risk activities were more frequently (although not always statistically significantly so) found among young men. This can also be explained by evolutionary theory because young men are on the mating market and need to show qualities and good skills to be successful. Women tend to choose among men of high status. Being good hunters and good warriors very often results in high social status. Furthermore, risk takers are often more successful than no-risk takers, paying costs but having higher benefits in return (Leakey & Lewin 1978, Konner 1982, Betzig *et al*. 1988, Chagnon 1988, Low 2000). However, on a proximate level, young men usually are more physically fit and some of the differences between age classes might be obtained because of these differences. Particularly in skiing activities that had a dramatic drop after the age of 50–60.

Natural resources today tend to be overexploited as a consequence of our evolved tendency to utilise resources. It is therefore of greatest importance to acquire knowledge of the kind of human behaviour that benefits survival of the environment. The understanding of such behaviour might contribute to change human attitudes to be more positive towards environmental issues and a sustainable use of natural resources. An evolutionary approach to understand human environmental behaviour contributes to such an understanding (Heinen & Low 1992, Low & Heinen 1993, Low 1996).

To conclude, motivation to participate in different outdoor recreation activities is based on social conditions as well as sex and age. In order to understand patterns of outdoor recreation activities, we must begin with the understanding of why and how we evolved to use our resources and how individual costs and benefits influenced our resource exploitation patterns.

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