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THE RELATIONSHIP OF ECOCENTRIC AND ANTHROPOCENTRIC MOTIVES TO ATTITUDES TOWARD LARGE CARNIVORES

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Abstract

Groups involved in the livestock vs large carnivore conflict hold widely divergent attitudes toward carnivores, yet they all endorse general ecocentric values. The hypothesis that contrasting motives for the endorsement of ecocentric values may mediate between the general values and attitudes toward carnivores was evaluated in a survey among sheep farmers, wildlife managers, and research biologists in Norway. Results showed positive associations between anthropocentrism and negative attitudes toward carnivores, and between ecocentrism and positive attitudes toward carnivores for all three groups. Farmers, relative to the other groups, scored lowest on the ecocentric and highest on the anthropocentric subscales, as operationalized by Thompson and Barton (1994). This result may be interpreted within a cognitive hierarchy model where environmental beliefs may transform general ecocentric values into negative or positive attitudes toward one specific environmental category.

Introduction

There is considerable variation across demographic and socio-economic groups in attitudes toward animals (Kellert, 1996). One group of animals that elicit intense and often extreme attitudes, positive or negative, is the large carnivores. Farmers, those who grew up with livestock production, the elderly, people with less education, and rural inhabitants often express negative attitudes toward wolves, while younger, better educated, and urban people express more positive attitudes toward this species (Kellert, 1985, 1991; Bjerke *et al.,* 1998). When other species of large carnivores are included, similar polarized views appear (Dahle, 1987).

Not surprisingly, the negative attitudes toward large predators are most typically found in groups whose economic interests are provoked by these animals. In one study, sheep farmers' personal anticipated consequence for future sheep farming if depredation continues revealed strong predictive potentials toward both negative and positive attitudes towards large carnivores (Vittersø *et al.,* 1999). The effect of personal importance of the presence of large carnivores on attitudes towards them has been shown also by Bright and Manfredo (1996) in a study of attitudes toward wolf reintroduction in Colorado, U.S.A. The economic interest shown by farmers when they seek to protect their livestock is accompanied by activation of strong psychological processes. One study showed that the farmer's emotional attachment to their sheep predicted the attitudes toward carnivores; the stronger the attachment that farmers revealed to their sheep, the more negative were their attitudes toward large carnivores (Vittersø *et al.,* 1998).

It has been hypothesized (Wilson, 1997) that differential access to social power, conflicting ideas about private property, and divergent beliefs about nature, are underlying social issues that drive the American debate about the reintroduction of wolves. Wilson (1997, p. 459) asserted that meanings of wolves 'are firmly rooted in divergent subcultural identities that define what each participant in a social movement envisions for the future of the West and where each sees himself or herself with respect to the land and to society'. Such perspectives lead to the expectation that the conflicting groups hold different basic values. There are many reasons to believe that values underlie many attitudes and

behaviours (Homer & Kahle, 1988). Schwartz (1994) expressed that values serve the interest of a social group, motivate action, serve as moral standards for conduct, and are acquired through socialization. He identified ten types of values ordered within a circular structure built around two dimensions. One dimension contrasts *openness to change* (stimulation, self-direction) with *conservation* (conformity, tradition, security). The second dimension contrasts *self-enhancement* (power, achievement) with *self-transcendence* (welfare for others, universalism, benevolence). Stern and Dietz (1994) distinguished between one *egoistic* and one *social-altruistic* value orientation, corresponding to Schwartz's self-enhancement and self-transcendence values, respectively. They also identified a third value orientation (*biosperic* or *ecocentric* values) which includes concern for nonhuman objects, like animals, ecosystems, and the biosphere. Such concern was also included in Schwartz's Self-transcendence cluster. However, Stern and Dietz (1994) could not identify one coherent set of biospheric or ecocentric values in a representative sample of U.S. population. They speculated 'that the proponents of biospheric values have not yet succeeded in generating a clear distinction in general public consciousness between valuing nature in itself and valuing nature because of the human benefits it provides' (Stern & Dietz, 1994, p. 78). But recently, Kalternborn and Bjerke (1998), in an analysis of the value structure of sheep farmers, wildlife managers, and research biologists in Norway, found an ecocentric value dimension (named nature) to be present in all three groups. This factor consisted of five value items: protect the environment, biological diversity, unity with nature, a world of beauty, and closeness to nature. These value items were rated as important or very important by respondents of all three occupational groups, although the sheep farmers scored lowest on the items 'biological diversity' and 'protect the environment'. The study also showed positive attitudes towards the large carnivores to be positively correlated with openness to change and nature, and that negative attitudes to large carnivores were positively correlated with value items from the security (e.g. family security, health, peace) and tradition (e.g. respect elders and tradition, loyalty, helpful) categories.

Since sheep farmers as well as wildlife managers and research biologists generally endorse ecocentric values (the nature value items) and yet hold widely divergent attitudes toward one group of animal species in their own environment (Kaltenborn *et al.,* in press), it seems pertinent to ask whether the groups have different motives for valuing nature. Two of the philosophical views of the human–environment relation are relevant here. One of them is the above-mentioned *ecocentric* (or biospheric) view, which includes concern for nonhuman objects and ecosystems even if conservation of them involves human sacrifice (Stern & Dietz, 1994; Oksanen, 1997). The second is the *anthropocentric* view, which holds human needs above other values, and which implies a support for protection of the environment if it satisfies human needs (Gardner & Stern, 1996, Chap. 3). Both views will often be activated in support of the same environmental policy, for example efforts to reduce air pollution, but for very different reasons.

The central hypothesis of the analyses in the present report is that the similarities, as well as the minor differences, in the value structure expressed by sheep farmers, wildlife managers, and research biologists (Kaltenborn & Bjerke, 1998) at least partly can be accounted for by assuming that farmers express relatively anthropocentric motives, while the two other groups express relatively ecocentric motives when asked about their opinions on environmental issues, in this case opinions about large carnivores. Thompson and Barton (1994) developed scales to measure ecocentric and anthropocentric motives, and we adopted their methodology to test our hypothesis.

In addition, we hypothesized that a positive association exists between the anthropocentric scale scores and scores on the scales which measure negative attitudes towards large carnivores, and between ecocentrism scale scores and the positive attitudes towards large carnivores.

Methods

Sampling and data collection

The target populations for the present study were (1) all sheep farmers in eight municipalities in the country of Hedmark, Eastern Norway, and all sheep farmers in three municipalities in the county of Rogaland, (2) all research biologists at Norwegian universities, colleges, and research institutes, and (3) all wildlife managers in Norway working at the municipality and county level. The questionnaire was sent by mail to 853 sheep farmers, 379 research biologists, and 551 wildlife managers (a total of 1783 recipients). Follow-up procedures included a reminder, sent 14 days after the initial mailing, and another reminder including the questionnaire 30 days after

the initial mailing. The response rates were 57·6 per cent for sheep farmers, 70·4 per cent for the research biologists, and 77·7 per cent for the wildlife managers (total average response rate = 66·5%). To assure an acceptable number of female responders among the sheep farmers (16%), one-third of the farmers were urged to let the female in the household complete the questionnaire.

Survey instruments

Attitudes towards large carnivores were measured by means of 35 statements (items), where five response options existed (from strongly agree to strongly disagree). The items were translated from English after Kellet (1991) to Norwegian, with some adaptations due to differences in which species exist in the U.S.A. and Norway. They are identical to the items used in the study by Bjerke *et al.* (1998), with the exception that *wolves* are replaced by *large carnivores* (defined in the questionnaire as wolves, bears, wolverine, and lynx). The 35 items can be classified into the six scales briefly defined by Kellert (1991, 1996):

Ecologistic: interest in the ecological value of the species, and its relationship to the environment.

Moralistic: opposition to cruelty and harm toward the species.

Naturalistic: interest in direct outdoor recreational contact with the species.

Utilitarian: interest in utilization of the species, or subordination of their habitat for the practical benefit of humans.

Negativistic: fear, dislike or indifference toward the species.

Dominionistic: interest in the mastery, control and dominance of the animals.

Previous analyses have shown (Vittersø *et al.,* 1998) that the first three scales constitute one coherent factor of positive attitudes toward large carnivores, and that the next three scales form one negative attitude factor. A comparison between the three occupational groups regarding attitudes towards large carnivores has been presented by Kaltenborn *et al.* (in press).

To express the degree of *ecocentric* and *anthropocentric* motives in the three groups of respondents, a selection of 25 items from the scale published by Thompson and Barton (1994) was used. Our survey also included the new environmental paradigm (NEP) scale (Dunlap *et al.,* 1992). Therefore, items in the Thompson and Barton (1994) scale which were similar in content to items in the NEP scale were removed. We used ten ecocentric, ten anthropocentric, and five environmental apathy items, which are listed in Table 1. The response options were from strongly agree (5) to strongly disagree (1).

Results

The items of the ecocentrism–anthropocentrism scale used in the present study, with the corresponding mean values for each of the three occupational groups, are shown in Table 1. The ANOVA analysis resulted in significant differences for each of the 25 items. The average item score for each of the subscales across the three groups of respondents are shown at the bottom of Table 1. Sheep farmers had a lower ecocentric ($F = 22·7$, df. = 2, $p < 0·000$), higher anthropocentric ($F = 93·9$, df. = 2, $p < 0·000$), and higher environmental apathy score ($F = 315·3$, df. = 2, $p < 0·000$), relative to wildlife managers and research biologists. Multiple comparisons, with Bonferroni corrections, showed that all significant differences were due to the differences between sheep farmers on the one hand, and the other two groups on the other, i.e. no significant differences appeared between wildlife managers and research biologists regarding sum scores of any of the three subscales. The largest difference appeared on the environmental apathy subscale. Sheep farmers, relative to wildlife managers and research biologists, more often agreed to items like 'too much emphasis has been placed on conservation', and 'I find it hard to get too concerned about environmental issues'. The differences on items on the anthropocentric subscale were also relatively large, with farmers agreeing more to items like 'the most important reason for conservation is human survival', and 'continued land development is a good idea as long as a high quality of life can be preserved'. The reliabilities for each of the three subscales were acceptable, as the alpha values were 0·65 (ecocentric subscale), 0·73 (anthropocentric subscale), and 0·76 (environmental apathy subscale).

Table 2 shows that for all three occupational groups, environmental apathy correlated significantly with anthropocentrism (Pearson's r's +0·23 to +0·31, $p < 0·01$) and with ecocentrism (r's −0·13 to −0·35, $p < 0·01$). Anthropocentrism and ecocentrism were uncorrelated among wildlife mangers and research biologists, but positively correlated ($r = +0·30$, $p < 0·01$) among sheep farmers.

Further, significant and positive correlations appeared (Table 2) between the three negative attitudes-toward-carnivores subscales (dominionistic, negativistic, utilitarian) and both anthropocentrism

TABLE 1
Mean scores and F*-values (ANOVA) for single items of the ecocentrism (ECO)–anthropocentrism (ANTHRO) and environmental apathy (APATH) scales (after Thompson & Barton, 1994) (*n *= 1092–1100) (1 = completely disagree to 5 = completely agree)*

Item	Scale	Mean scores			*F*-value*
		Farmers	Managers	Biologists	
1. One of the worst things about overpopulation is that natural areas are getting destroyed for development	ECO	3·8	3·5	3·7	7·7
2. I can enjoy spending time in natural settings just for the sake of being out in nature	ECO	4·0	4·2	4·3	7·2
3. The worst thing about the loss of the rain forest is that it will restrict the development of new medicines	ANTHR	2·8	2·3	2·0	36·6
4. Sometimes it makes me sad to see forests cleared for agriculture	ECO	2·6	3·2	3·5	48·2
5. It seems to me that most conservationists are pessimistic and somewhat paranoid	APATH	3·6	2·6	2·5	110·3
6. I prefer wildlife reserves to zoos	ECO	3·5	4·6	4·5	140·9
7. The best thing about camping is that it is a cheap vacation	ANTHR	2·9	2·6	2·6	12·9
8. I find it hard to get too concerned about environmental issues	APATH	3·0	1·8	2·0	143·5
9. I need time in nature to be happy	ECO	3·8	4·3	4·2	28·3
10. The thing that concerns me about deforestation is that there will not be enough lumber for future generations	ANTHR	2·6	1·7	1·5	102·3
11. Sometimes when I am unhappy I find comfort in nature	ECO	3·9	4·0	3·8	3·5
12. I don't care about enviornmental problems	APATH	1·8	1·1	1·2	98·8
13. One of the most important reasons to keep rivers and lakes clean is so that people can have a place to enjoy water sports	ANTHR	1·5	1·1	1·2	36·2
14. I am opposed to programs to preserve wilderness, reduce pollution and conserve resources	APATH	2·0	1·2	1·1	107·0
15. It makes me sad to see natural environments destroyed	ECO	4·3	4·6	4·6	21·7
16. The most important reason for conservation is human survival	ANTHR	3·6	2·9	2·7	51·2
17. One of the best things about recycling is that it saves money	ANTHR	2·6	1·9	1·9	44·9
18. Nature is important because of what it can contribute to the pleasure and welfare of humans	ANTHR	3·7	2·9	3·2	46·2
19. Too much emphasis has been placed on conservation	APATH	2·9	1·5	1·5	220·1
20. We need to preserve resources to maintain a high quality of life	ANTHR	3·8	4·3	4·3	37·3
21. Being out in nature is a great stress reducer for me	ECO	4·4	4·7	4·6	21·3
22. One of the most important reasons to conserve is to ensure a continued high standard of living	ANTHR	2·6	2·2	2·2	12·3
23. One of the most important reasons to conserve is to preserve wild areas	ECO	3·2	3·3	3·9	28·0
24. Continued land development is a good idea as long as a high quality of life can be preserved	ANTHR	3·0	2·1	2·3	72·6
25. Sometimes animals seem almost human to me	ECO	3·5	2·6	2·5	67·0
Ecocentric subscale: average item		3·7	3·9	3·9	22·7
Anthropocentric subscale: average item		2·9	2·4	2·4	93·9
Environmental apathy subscale		2·6	1·6	1·6	315·3

*All F's significant at $p < 0{\cdot}001$, except item 11($p = 0{\cdot}03$).

and environmental apathy. This applied for all three occupational groups. The three negative attitude subscales did not correlate with ecocentrism among the sheep farmers, but correlated negatively with ecocentrism among wildlife managers. The three positive attitude-toward-carnivores subscales (ecologistic, moralistic, naturalistic) correlated positively with ecocentrism among all three groups of respon-

TABLE 2
Correlations between the anthropocentric, apathy, and ecocentrism subscales, and the six subscales of Kellert's attitudes-toward-carnivores survey instrument

	Anthro	Apathy	Ecocent	DOM	NEG	UTIL	ECOL	MORAL	NATUR
Sheep farmers ($n = 466$)									
Anthropocentrism	1·00	0·31*	0·30*	0·34*	0·40*	0·36*	−0·17*	0·20*	−0·07
Environmental apathy	0·31*	1·00	−0·13*	0·42*	0·32*	0·38*	−0·23*	0·07	−0·20*
Ecocentrism	0·30*	−0·13*	1·00	0·05	0·09	−0·02	0·16*	0·28*	0·33*
Wildlife managers ($n = 416$)									
Anthropocentrism	1·00	0·28*	0·02	0·20*	0·19*	0·25*	−0·24*	−0·10	−0·14*
Environmental apathy	0·28*	1·00	−0·21*	0·29*	0·28*	0·43*	−0·35*	−0·19*	−0·31*
Ecocentrism	0·02	−0·21*	1·00	−0·11*	−0·13*	−0·21*	0·34*	0·32*	0·35*
Research biologists ($n = 224$)									
Antrhopocentrism	1·00	0·23*	0·01	0·17*	0·24*	0·32*	−0·23*	−0·20*	−0·13
Environmental apathy	0·23*	1·00	−0·35*	0·14*	0·24*	0·32*	−0·24*	−0·30*	−0·28*
Ecocentrism	0·01	−0·35*	1·00	0·02	−0·02	−0·18*	0·31*	0·39*	0·50*

*Correlation is significant at the 0·01 level (two-tailed).
**Correlation is significant at the 0·05 level (two-tailed).
DOM: dominionistic; NEG: negativistic; UTIL: utilitarian; ECOL: ecologistic; MORAL: moralistic; NATUR: naturalistic subscales. Anthro: anthropocentrism; Apathy: environmental apathy; Ecocent: ecocentrism.

dents. They generally correlated negatively with environmental apathy and with anthropocentrism, except for the correlation between apathy and the moralistic attitude subscale, which was positive among the sheep farmers.

Discussion

As hypothesized, sheep farmers scored lower on the ecocentric, and higher on the anthropocentirc subscale, compared with wildlife managers and research biologists. Sheep farmers also had higher scores on the environmental apathy subscale. The hypothesis about a positive association between anthropocentrism and negative attitudes toward large carnivores, and between ecocentrism and positive attitudes toward this groups of animals, was also confirmed. We have previously shown that the three occupational groups express relatively similar value structures (Kaltenborn & Bjerke, 1998), and that sheep farmers have much more negative attitudes toward large carnivores than the two other groups express (Kaltenborn *et al.,* in press). The results of the present study can fit into a cognitive hierarchical model (Homer & Kahle, 1988; Stern & Dietz, 1994), where the environmental attitudes or beliefs expressed via the ecocentrism–anthropocentrism scale mediates between general values and more specific attitudes toward large carnivores. However, to demonstrate the exact nature and size of this potential mediational relationship will require additional analyses, since the present analysis concerns only the belief–attitude relation. But additional beliefs also affect the relations between values and attitudes toward large carnivores, making these attitudes highly polarized across groups. For example, the belief about the effects which large carnivores may have on their future income strongly predicts the negative attitudes toward large carnivores among the sheep farmers (Vittersø *et al.,* 1998).

It could be questioned whether the Thompson and Barton (1994) scale and the carnivore attitude scale really tap different and independent levels in a cognitive hierarchy. Ecocentric items of the Thompson and Barton scale (e.g. 'I need time in nature to be happy') bear some semantic similarity to naturalistic items of the attitude towards carnivores scale (e.g. 'I would very much like to see large carnivores in the wild'). Sematic similarity may also be traced when anthropocentric and utilitarian items are compared. However, the subscales of the anthropocentrism – ecocentrism scale are made up of statements about a variety of environmental issues, creating a rather general attitude, while each item of the Kellert attitude scale has one specific object, namely the large carnivores.

The group differences observed in the present study should not, however, be taken to mean that sheep farmers express anthropocentric and apathetic attitudes toward conservation issues. On average, they agree somewhat to ecocentric statements, and neither agree nor disagree to anthropocentric and environmental apathy items. In fact, a significant positive correlation was found between

anthropocentrism and ecocentrism among farmers, but not among the other two groups of respondents, and not it the two samples of the Thompson and Barton (1994) study. Sheep farmers enjoy time in nature and dislike destruction of natural areas (ecocentric attitudes). Simultaneously, they agree that human benefits of environmental protection are important (anthropocentric attitudes). Ecocentric and anthropocentric attitudes, as measured by the Thompson and Barton (1994) scale, are not mutually exclusive, and a positive correlation between them should be expected also in the other groups which depend upon natural processes for their living.

On average, sheep farmers in the present study responded neutrally to environmental apathy statements, while researchers and environmental managers clearly disagreed with these items. This finding may be related to previous studies showing farmers to be less environmentally aware and concerned, compared with nonfarm populations (e.g. Van Liere & Dunlap, 1980; Albrecht *et al.,* 1982).

That sheep farmers endorse general ecocentric values (Kaltenborn & Bjerke, 1998) agrees somewhat to ecocentric statements from the Thompson and Barton (1994) scale, yet expressing very negative attitudes toward large carnivores is not surprising. The depredation of livestock experienced by many sheep farmers may lead the large carnivores into a function as an out-group in the cognitive processing of the farmers (Plous, 1993), and members of outgroups are often perceived as undeserving and expendable. In this process, large carnivores may also become dissociated from other animals, catalysed by increasing economic conflicts between people and carnivores (Opotow, 1993) and a tendency to anthropocentric motives. It may be more difficult for ecocentric persons to treat one salient group of animals as a dissociated entity, since such persons acknowledge the intrinsic value of all animals and also want to preserve ecosystems and habitats. But also ecocentric persons would express negative attitudes toward some groups of living creatures, like harmful bacteria or viruses. The cognitive consistency of our values, beliefs, attitudes, and behaviour toward natural categories, including how we decide the worth of animal groups, need further study, as the threat against biodiversity continues.

Our findings have implications for the controversies regarding the presence of large carnivores in Norway. The similarity across conflicting groups as to general value structure (Kaltenborn & Bjerke, 1998) reflects considerable agreement about the necessity of biological diversity and protection of the environment. Cognitively, the existence value of large carnivores should be consistent with such values, also among sheep farmers. The differences in motives for protecting nature shown in the present report most likely reflects that the current controversy to a large degree is nourished by considerations about the utility of natural resources and future economic prospects, rather than by widely divergent values. Consequently, political authorities could reduce the intensity of this conflict between contrasting economic interests by instituting measures aimed at a reduction of the economic insecurity among the sheep farmers, although the value differences across groups would keep the conflict alive at a lower intensity.

Notes

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