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Direct experience and attitude change towards bears and wolves

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Understanding how changes in the sizes of large carnivore populations affect the attitudes of the public is vital in order to mitigate social conflicts over large carnivore management issues. Using data from two Swedish postal surveys in 2004 and 2009, we examined the probable social effects of a continued increase in the Swedish populations of bear and wolf by comparing levels of direct experience of bears and wolves with public attitudes towards these animals. We report an increase in direct experience of bears and wolves, lower levels of acceptance of the existence of these animals, and a lower degree of support for the policy goals of both species in 2009 compared to 2004. We also find that these changes are more prominent in areas with local carnivore populations than in other areas of Sweden. Our results imply that attitudes towards bears and wolves are likely to become more negative as populations continue to grow. The uneven distributions of the carnivore populations are likely to generate more frequent social conflicts in the future as they could cause an increase in the attitudinal divide between those members of the Swedish public who have had direct experiences of carnivores and those who have not.

The Swedish parliament introduced population goals for the 'big five' carnivore species in the Swedish fauna – bear *Ursus arctos*, wolverine *Gulo gulo*, lynx *Lynx lynx*, wolf *Canis lupus* and golden eagle *Aquila chrysaetos,* in 2000. Thi what done to ensure the long-term survival in accordance with the criteria specified in the EU Habitat Directive (Council Directive 92/43/EEC of 21 May 1992). Nine years later the defined minimum levels and interim targets had been achieved (Liberg 2010) and the government started to re-evaluate the status of the animals to update the policy (Dir.2010:65 2010).

The viability of large carnivore populations are affected both by a favorable ecological status and local acceptance, as acceptance is considered to be key to achieving sustainable long-term conservation of large carnivores (Guidelines for Population Level Management Plans for Large Carnivores 2008). A majority of Swedes support the current population goals set by parliament (Ericsson et al. 2006), but attitudes towards these policy goals and the animals as such are likely to change in the future as they are based on indirect information and poorly informed beliefs (Heberlein and Ericsson 2008). These attitudes vary across Sweden geographically and inhabitants in rural areas with large carnivores are more negative to the population goals than other Swedes (Ericsson et al. 2006). Since 2000, the increasing numbers of bears and wolves, and their impact on farming, reindeer husbandry and hunting have given rise to intense debate, increased political polarization and societal conflicts, and as a consequence the revised large carnivore policy from 2013 marks a shift in policy; away from ecological concerns towards more socio-economic aspects (Prop. 2012/13:191).

Since 2000, Sweden has experienced an increase in the numbers of bears and wolves (Kindberg et al. 2011, Svensson et al. 2012). Elsewhere, a fast growth in bear and wolf populations have correlated with a change towards more negative attitudes towards these animals (Kellert 1987, Bath and Buchanan 1989, Mech 1995, Rodriguez et al. 2003, Bisi et al. 2010) and towards other species of large carnivores (Ericsson et al. 2008). Livestock depredation, competition for huntable game and clashes between different views of nature arises with growing populations of bear and wolves, and as these issues involves different groups in society in different ways social conflicts are likely to increase (Rodriguez et al. 2003, Skogen and Krange 2003, Ericsson et al. 2008). Central to this discussion is the role of direct experience on these societal reactions when large carnivore species e.g. wolves reappear in the fauna (Ajzen 1989, Ericsson and Heberlein 2003, Heberlein 2012). We argue that previous research on attitude change may have been too limited in its scope (Ericsson and Heberlein 2003) or contained unrepresentative sampling (Treves et al. 2013) to test the hypothesis of direct experience on attitudes towards large carnivores conclusively. The field also suffer from a general lack of reliable time series data (Williams et al. 2002) making comparisons over time problematic. In an attempt to improve on these shortcomings, we analyzed data from two large representative samples of the Swedish public taken five years apart.

Attitudes are mental structures made up of cognitive and affective components (Fig. 1) which affect our evaluation of attitude objects (Heberlein 2012). An attitude object can be an actual physical object or something more abstract such as an idea or a situation (Olson and Zanna 1993). Over time, repeated interaction with an attitude object forms the basis of an attitude which acts as a roadmap for a response when faced with the same, or a similar, attitude object in the future (Olson and Zanna 1993). Thus, attitudes serve as a mental shortcut for the individual when evaluating an attitude object, cutting down on the costs of decision-making and possibly influencing behavior (Alwin and Krosnick 1991, Eagly and Chaiken 1993, Olson and Zanna 1993). Attitude patterns are assumed to be socialized early and then generally strengthened over time as a result of confirmation bias (Eagly and Chaiken 1993, McFarlane and Boxall 2003, Heberlein and Ericsson 2005), making them stable mental structures that govern the creation of our identity, our world view and our actions (Olson and Zanna 1993).

Though normally resistant to change, attitudes may also change rapidly (Zaller 1992, Olson and Zanna 1993, Eagly and Chaiken 1998, Heberlein 2012). The conviction with which the pre-existing attitude is held determines the cost associated with attitude change, while the relevance of the new input for the attitude in question determines the benefit gained from attitude change; if the benefit exceeds the cost, an attitude change takes place (as suggested by Whittaker et al. 2006, Fazio et al. 1983, Fazio 1995). Thus, attitude change is most likely to occur in situations where an attitude with a low cost of change (henceforth referred to as a loosely held attitude) is challenged by new information or a new experience (Ajzen 1989). Direct experience of an attitude object has been shown to be more likely to change attitudes than more indirect experiences and information (Fazio et al. 1982). The attitudes of the Swedish public towards bears and wolves are likely to be loosely held, as they are based largely on second-hand information and a majority of the population have no direct experience of bear and wolf. This should make them susceptible to change (Williams et al. 2002, Heberlein and Ericsson 2008) and makes both new information and direct experience possible drivers of attitude change (Heberlein and Ericsson 2008, Houston et al. 2010).

A recent study suggested that knowledge about black bears influences attitudes toward recovery strategies (Morzillo et al. 2010). However, the findings of quantitative studies vary. While some studies have discovered a positive relationship between knowledge and support for wolves, other studies point to a negative or nonexistent relationship (Kellert 1985, 1999, Biggs 1988, Lohr et al. 1996, Bjerke et al. 1998, Williams et al. 2002). Consequently it is still unclear to which extent knowledge makes people more or less supportive of wolves.

A comparison of two samples both taken in 2004, revealed that municipalities with a carnivore presence tended to have more negative attitudes towards the wolf policy goal (Ericsson et al. 2006). This warrants oversampling of small rural municipalities, as these tend to also have a large carnivore presence. These less positive attitudes in the carnivore area could potentially be explained by experience (Karlsson and Sjöström 2007), or by the predominantly rural locations of the bear and wolf populations (Ericsson et al. 2006, Treves et al. 2013). Sweden has an urbanization rate of approximately 85% (<www. scb.se>). This means that our random national sample will, mostly reflect the attitudes of urban respondents, while the proportional multiple municipal sample design used in the carnivore areas will reflect the attitudes of rural respondents (Ericsson et al. 2006, Heberlein and Ericsson 2008).

The predominantly rural nature of the carnivore area gives carnivore issues strong overtones of urban-rural conflict, often linked to personal experiences (Heberlein and Ericsson 2008). Typically, rural inhabitants see the protection of bears and wolves as something that is ultimately controlled by external forces, i.e. the urban majority (Skogen and Krange 2003, Heberlein and Ericsson 2008), while the rural population are the ones affected by the cost of living with these animals in terms of predation damage to livestock, reindeer, and hunting dogs (Swedish Government Official Report, SOU 2012:22). The effect of direct experience of large carnivores on attitudes towards them may be hard to determine due to the subjective nature of such experiences (Williams et al. 2002, Heberlein and Ericsson 2005, Karlsson and Sjöström 2007, Treves et al. 2013). Some studies have suggested a negative correlation between experience and the wolf policy goal (Ericsson et al. 2006), indicating that people become less positive with experience. However, others have maintained that hearing a wolf howl or seeing a wild wolf can be valued as a positive experience (Heberlein and Ericsson 2005), while other hypotheses posit that the negative effects caused by a population increase will vanish over time (Zimmermann et al. 2001, Majic and Bath 2010).

Studies worldwide suggest a link between change in large carnivore population size, experience of large carnivores, and a change in attitudes of the public towards them and their policy goals (sensu Williams et al. 2002). We treat knowledge as one possible mediator in this process, where direct experience on a personal level reinforces already known facts (Fazio et al. 1982), and is more likely to alter beliefs that a person holds towards the bears or wolves. This may then in turn result in an attitude change (Heberlein and Ericsson 2008, Heberlein 2012).

Regardless of the specific paths and direction of effects, we predict that the spatial expansion and increase in the populations of bear and wolf will have an effect on attitudes towards these animals and their related policy goals.

This process should be driven by both indirect and direct experience (Ajzen 1989), with direct experience having the strongest effect. Direct experience is considered to be first-hand experience, such as seeing an animal or an animal track, while indirect experience is information gathered through other sources such as the press. Attitudes towards bears and wolves should change over time, and this change should be greater in areas where these animals are present than in other places, as these areas are subjected to an increase in both direct and indirect experience. Based on this literature review, we make the following predictions:

- Levels of experience of carnivores should be higher in 2009 than in 2004.
- Levels of experience of carnivores should be higher in the carnivore area.

– Attitudes towards the existence of bears and wolves and their policy goals should be different in 2009 than in 2004.
– Attitude differences between 2009 and 2004 should be greater in the carnivore area than in the non- carnivore area.

Methods

Study area

We report data from two postal surveys using up to four contacts (Dillman et al. 2009). In both surveys, we used a two-tiered sample design: one random, proportional sample on a national level with a sample size of 1001 (in 2004) and 1067 (in 2009), and one proportional municipal sample, where municipalities contributed each with an individual sample size of 150, with a total of 6432 observations (in 2004), and 5404 observations (in 2009). The municipal samples were drawn from the 69 municipalities of the six northern Swedish counties (Dalarna, Gävleborg, Västernorrland, Jämtland, Västerbotten and Norrbotten). This roughly corresponds to the areas in Sweden with permanent large populations of bear and/or wolf or frequent bear and/or wolf activity (Krange et al. 2012), hereafter termed the Swedish carnivore area.

Our study design allowed us to isolate the effects of direct experience, using the national sample as a control group, while the municipal sample acted as a treatment group. The national sample is representative of the majority of Swedes; a largely urban group, with less direct experience of bears and wolves, while the municipal sample provided data on attitudes towards bears and wolves from rural groups with a greater level of direct experience or being close to individuals with direct experience (Ericsson et al. 2006).

Sampling and response rates

The 2004 survey had a response rate of 55% for the national sample, and 62% for the carnivore area sample. In 2009, the corresponding rates were 46% for the national sample and 52% for the carnivore area sample.

Drop-out analysis has been carried out with respect to sex and age. The differences in the overall response rates between our samples and the respondents as a whole were to be expected, given previous wildlife surveys. Women's participation was lower than for men and older respondents had higher response rates. Thus, given the findings of previous research, this sampling bias will likely result in somewhat more negative attitudes towards carnivores, and a slightly higher degree of direct experience.

Data analysis

All data analyses were carried out using STATA 13. Population weights were employed when analyzing the municipal samples to achieve proportional samples reflecting population size. Two-way ANOVAs were conducted for each experience, existence and attitude item separately, with measurement point and sample as independent variables. This was followed by Tukey–Kramer post hoc mean comparison tests between sampling groups (Dunnett 1980, Hayter 1984). Scales were created for each set of items using a combination of Cronbach's alpha-based coherence tests and principal component analysis (Sokal and Rohlf 1981).

Measurements

We measured experience with two questions repeated for each species with the answer alternatives: never, once, and more than once. Translated from Swedish, the questions were: "Have you ever seen bear/wolf tracks?" and "Have you ever seen a wild bear/wolf?"

The attitude items were measured with two questions repeated for each species. In both cases, the alternatives ranged from 1 to 5 where 1 or 2 represented a negative attitude/a wish to reduce the policy goal and 4 or 5 represented a positive attitude/a wish to increase the policy goal; 3 was the neutral/acceptable alternative. Translated from Swedish, the questions were roughly: "What is your opinion of the fact that bears, wolverines, lynx and wolves exist in Sweden?" and "In the spring of 2001, the Swedish parliament decided how many large carnivores we should have in Sweden. The first goals were set for the number of reproducing females, corresponding to at least 1000 brown bears (1500 lynx, 400 wolverines and 200 wolves). What is your opinion of the goals set by the parliament for large carnivores in Sweden?" A high degree of correlation (r_p) among the attitude items within each group of items (0.74 between the existence items and 0.71 between the policy items) encouraged the use of principal component analysis to avoid multicollinearity (Morgan and Sonquist 1963).

The PCA produced one-component solutions for all three set of items ($k > 1$) with internal reliability values (Chronbach's alpha) of 0.70 for the experience items, 0.84 for the existence items, and 0.82 for the policy items. To facilitate interpretation, we substituted the component scores with the raw sums of the items as these correlated highly ($r_p > 0.99$). This process resulted in three 10-step scales where a low value indicated a lesser degree of direct experience, a less positive attitude towards the existence of the species in Sweden, or a willingness to reduce the policy goals of the species.

Results

Direct experience

In both samples more respondents reported having direct experience with bears and wolves in 2009 than in 2004, and direct experience with bear (Table 1) was more common than with wolves (Table 2). In the carnivore area 73% of the respondents had seen bear tracks in 2009 compared to 68% in 2004. In 2009 36% had seen a wild bear compared to 31% in 2004. In the national sample 27% and 21% of the respondents had seen bear tracks in 2009 and 2004 respectively, and 13% had seen a wild bear at both measurement points.

In the carnivore area wolf tracks had been seen by 38% of the respondents in 2009 and 30% in 2004. 18% had seen a wild wolf in 2009 compared to 13% in 2004. In the national

Table 1. Reports of direct experiences with bears. Letters indicate a significant ($p < 0.05$) difference from groups denoted with that letter.

	Carnivore area		National sample	
	2004 (a)	2009 (b)	2004 (c)	2009 (d)
Bear tracks				
never	32%bc	27%ad	79%ad	72%bc
once	19%bc	19%ad	13%a	14%b
more than once	49%bc	54%ad	8%ad	13%bc
Wild bear				
never	69%bc	64%ad	89%a	89%b
once	17%bc	18%ad	7%a	7%b
more than once	14%bc	18%ad	4%a	4%b

Table 3. Attitude items relating to the existence of bears and wolves in Sweden. Letters indicate a significant ($p < 0.05$) difference from groups denoted with that letter.

	Carnivore area		National sample	
	2004 (a)	2009 (b)	2004 (c)	2009 (d)
Bear				
like	70%bc	63%ad	80%a	76%b
neutral	20%c	23%	15%a	19%
dislike	10%bc	14%ad	5%a	6%b
Wolf				
like	61%bc	56%ad	75%a	71%b
neutral	20%c	21%	16%a	18%
dislike	19%bc	23%ad	9%a	11%b

sample 21% of the respondents answered that they had seen a wolf tracks in the 2009 survey while the corresponding figure in 2004 was 16%. 12% had seen a wild wolf in 2009 compared to 9% in 2004.

Respondents in the carnivore area had more direct experience with carnivores than the respondents in the national, more urban, sample in both surveys; the difference between the two time periods was greater in the carnivore area than in the national sample. The ANOVA produced significant simple main effects ($p < 0.05$) with regards to both measurement point in time and sample across all experience items, as well one statistically significant interaction effect ($p < 0.05$) between measurement point and sample for the seen bear tracks item, $F_{1,12593} = 10$, 92 Indicating that being a part of the carnivore area sample led to a more rapid increase in the direct experiences in relation to bear tracks over time, than in the national sample.

Existence

Respondents in the carnivore area supported the existence of bears and wolves (Table 3) in Sweden with a majority of the respondents 'liking' the existence of both species in Sweden. Wolves had the lowest support in both time frames, with 56% in 2009 and 61% in 2004; the corresponding values for bears were 63% and 70%. An increase in selection of both the neutral alternative for bears and wolves, and the dislike alternative, indicate a transition to less positive attitudes towards the existence items in 2009 than in 2004. The national sample showed no significant ($p < 0.05$) difference between 2009 and 2004, but exhibited more positive attitudes than the carnivore sample over both items in 2009 and 2004.

The ANOVA produced significant simple main effects ($p < 0.05$) with regards to both measurement point in time and sample across all existence items, but showed no statistically significant interaction effects between measurement point and sample.

Policy

In the carnivore area sample, acceptance for the current bear policy was lower in 2009 (47%) than in 2004 (53%). The wolf-related items showed little or no change in terms of acceptance (Table 4). However the support for increasing the wolf policy goal for wolves was lower in 2009 than in 2004, and the support for decreasing the policy goal was higher in 2009 than in 2004.

The ANOVA produced significant simple main effects ($p < 0.05$) with regards to both measurement point in time and sample across all policy items, and a significant ($p < 0.05$) interaction effect between measurement point and sample $F_{1,12470} = 7.44$ with regards to the bear policy item. This indicates that the bear policy acceptance have decreased faster in the carnivore area than in the national sample.

The national sample showed a lower "should be increased" rating for bears and for wolves, and a lower support for increasing and for accepting the wolf policy when comparing 2009 to 2004. Policy support in the carnivore sample was lower than in the national sample with regards to all items except the 2004 measurement of acceptance of the wolf policy goal.

Table 2. Reports of direct experiences with wolves. Letters indicate a significant ($p < 0.05$) difference from groups denoted with that letter.

	Carnivore area		National sample	
	2004 (a)	2009 (b)	2004 (c)	2009 (d)
Wolf tracks				
never	70%bc	63%ad	84%a	79%b
once	17%	19%d	11%	12%b
more than once	13%bc	19%ad	5%ad	9%bc
Wild wolf				
never	87%b	82%ad	91%a	88%bc
once	10%	13%	6%	9%
more than once	3%b	5%ad	3%	3%b

Table 4. Attitude items relating to the Swedish policy goals towards bear and wolf. Letters indicate a significant ($p < 0.05$) difference from groups denoted with that letter.

	Carnivore area		National sample	
	2004 (a)	2009 (b)	2004 (c)	2009 (d)
Bear policy goal				
should be increased	17%bc	15%ad	27%a	25%c
accept	53%bc	47%ad	62%a	60%c
should be decreased	30%c	38%d	11%a	14%c
Wolf policy goal				
should be increased	27%bc	22%ad	38%a	30%c
accept	44%	43%d	50%d	55%bc
should be decreased	29%bc	35%ad	12%ad	16%bc

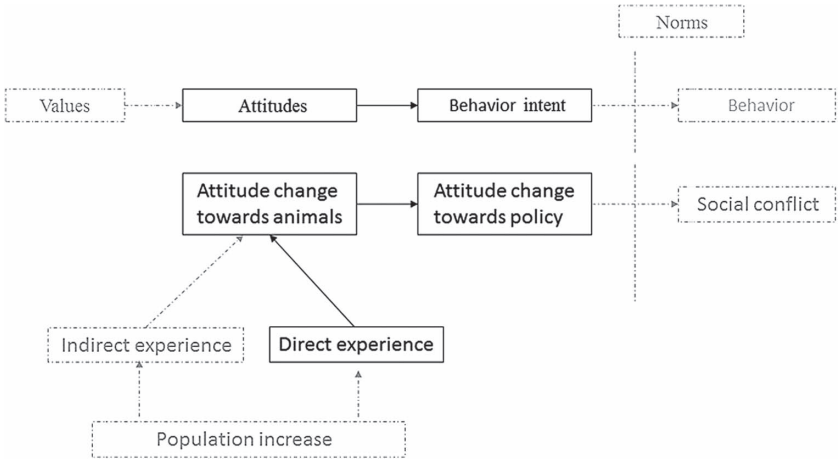

Figure 1. Hypothesized relationships between population increase, experience with large carnivores, attitudes towards large carnivores, and large carnivore policy. Solid items are measured in this study, while dashed items are not.

The differences in mean scores of the raw sum scales between 2004 and 2009 were statistically significant ($p < 0.05$) for all three scales within the carnivore area sample: the mean values of the existence scale and the policy scale were lower in 2009 (0.19 scale points and 0.33 scale points, respectively), and the mean score of the experience scale was 0.34 points higher. The national sample showed a significant result in the case of the policy scale, which was 0.22 scale points lower in 2009.

The carnivore area sample exhibited a statistically significant ($p < 0.05$) correlation between the experience scale and the other two scales within each time period, with correlations (Pr) of –0.10 within each time period, while no such correlation was found in the national sample. Effect sizes ranged from 0.02 to 0.08, which is to be expected given the slow rate of attitude change.

The carnivore area exhibited higher levels of direct experience in 2009 than in 2004, and less positive attitudes to both the existence scale and the policy scale in 2009 compared with 2004. In the non-carnivore area, the policy scale exhibited a significant difference ($p < 0.05$) with less positive attitudes in 2009 compared to 2004. In the non-carnivore area, there was a statistically significant difference in the policy scale ($p < 0.05$), with the 2009 score being lower than the 2004 score. The carnivore sample also exhibited a higher proportion of respondents reporting direct experience of bears and wolves in 2009 compared to 2004. The degree of acceptance towards the existence of bears and wolves was higher in 2004 than in 2009, while no such differences could be established in the national sample. These findings are all in line with our theoretical predictions, supporting a negative direction of effects between direct experience and attitudes towards bears and wolves, and thus making a causal link between direct experience with bears and wolves and attitude change plausible.

Discussion

Attitude change on an aggregate level is normally considered to be a slow process, driven by broad societal trends (Williams et al. 2002) or generational value shifts (Inglehart 1995). However more rapid attitude change have been observed in connection with growth of large carnivore populations (Duda et al. 1998, Treves et al. 2013). Our results show an attitude change in the general public with regards to bears and wolves between 2004 and 2009. This change is likely the result of people being subjected to direct experience with an attitude object forcing them to reevaluate their loosely held attitudes towards that attitude object (Fazio et al. 1982, 1983, Olson and Zanna 1993, Eagly and Chaiken 1998, Williams et al. 2002, Ericsson and Heberlein 2003, Heberlein and Ericsson 2008); as previous research has indicated that the Swedish context is characterized by low levels of direct experience (Williams et al. 2002, Heberlein and Ericsson 2008), and attitudes based mostly on indirect information (Heberlein and Ericsson 2008). Our empirical findings is consistent with a causal connection between direct experience of, and attitude change towards, bears and wolves and their respective policies.

Such a causal connection, primarily linked to change in population size of, in this case, brown bears and grey wolves has a number of interesting implications. It means that differences in attitudes between urban and rural areas need to be understood in terms of overlap of carnivore areas and rural areas in addition to the cultural factors observed in previous research (Skogen and Krange 2003, Heberlein and Ericsson 2005, Krange and Skogen 2007), thus making differences in attitudes an issue of proximity (sensu Karlsson and Sjöström 2007) and direct experience.

Increases in the populations of bears and wolves leads to a more rapid change of attitudes in the areas housing those populations compared to areas with few or bears and wolves. The role of the wolf as a driver of attitudes and attitude change (Ericsson et al. 2008) offers an important explanation of the social conflicts arising in connection to growing numbers of wolves and reintroduction of wolves in different contexts (Kellert 1987, Bath and Buchanan 1989, Ericsson and Heberlein 2003, Dickman 2010). The wolf, is not only a symbol of, for example, urban power over rural areas (Skogen and Krange 2003) but also have a more direct effect on attitudes via direct experience (Fazio et al. 1982,

Williams et al. 2002, Heberlein and Ericsson 2008). Furthermore, the uneven distribution of the animals geographically naturally creates different rates of attitude change in rural and urban areas, which generates friction between urban and rural groups in society.

From a theoretical perspective, it is also important to differentiate between the attitudes towards the species per se and the policy objectives linked to the species. While there are changes in attitudes to both the species and the policy objectives related to these species in areas where people have direct experience of bear or wolf, another pattern emerges in areas with limited direct experience of bears or wolves. Although attitudes towards bears and wolves are more positive in urban areas, the attitudes to the policy become less accepting or even negative over time. Our findings thus show that people are able to distinguish between different attitude items and evaluate policy issues and their effects without direct experience, indicating that attitudes to different policy alternatives are probably easier to change and influence through indirect experience than attitudes to the existence of bears and wolves in the fauna.

There are several lessons to be learnt from our findings in terms of conservation policy. Since the difference in acceptance between rural and urban is, in part, related to the distribution of the animals and direct experience rather than solely created by slow changing cultural differences, this suggests that social conflicts could be ameliorated more quickly than previously assumed. This, however, calls for a more differentiated policy that would take into consideration regional and local aspects including local and adaptive management (Sandström 2009).

More direct experience seems to lead to lower policy acceptance. Since Sweden can sustain considerably larger populations of bears and wolves from a biological perspective, and populations are currently growing and expanding their geographical range (Swedish Government Official Report SOU 2012:22) the issue becomes political in nature rather than biological as the ultimate limits to growth is given by the policy goals, which is connected to public acceptance. The revision of Sweden's national large carnivore policy (Prop. 2012/13:191) essentially meant a lowering of the populations targets, and could reflect the lower levels of acceptance of the policy from 2000 observed here.

Future research needs to repeat, solidify and conceptually improve the understanding of the underlying mechanisms behind our findings with respect to experience. Our work stops at establishing zero order correlations at an aggregate level. It would be rewarding to expand the model to account of other variables in addition to direct experience, lengthen the time series in order to say something about development over time, and complement these results with a panel study design in order to follow the development of respondents over time on an individual level in order to track attitude change over time on the individual level.

Conclusions

Acceptance of bears and wolves in Sweden is generally high, but the previously observed pattern seen in 2004 (Ericsson et al. 2006) of lower acceptance of these animals in the carnivore areas was repeated in 2009. These variations seems to be increasing with the carnivore area having less positive, and more rapidly changing attitudes than the national sample. Our empirical findings thus support the theoretical assumption that direct experience drives attitude change. The carnivore area sample saw a larger attitude change than the national sample, and displayed an increase in direct experience which was not found in the national sample. This makes direct experience of bears or wolves a plausible link between changes in the size of the animal populations and attitude change. This would make the uneven geographical distribution of the populations of bears or wolves in Sweden a potential social problem, as rural discontent is likely to increase in tandem with growing carnivore populations and increased direct experience with bear and wolf.

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