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Concern about climate change, biodiversity loss, habitat degradation and landscape change: Embedded in different packages of environmental concern?

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ABSTRACT

Climate change and biodiversity loss are often seen as the two most serious environmental threats facing humanity. It also seems to be a common notion that concerns about these issues are embedded in the same package of environmental concern among the public. In this article, we probe the relationship between dimensions of concern about environmental challenges. In a general population survey in Norway, respondents were asked how concerned they were about several environmental issues. Factor analysis revealed that concern about climate change and concern about major causes of biodiversity loss, such as habitat destruction, loaded on different factors. When respondents ranked the three issues they were most concerned about, there was minimal overlap between climate change and biodiversity loss. It appears that relatively distinct profiles exist, based on different interpretations of current environmental challenges. The profiles are differently related to background factors such as social class, education and gender. These relationships are not strong, but the association between confidence in various institutional actors and the concern profiles is quite distinct, and different for the two. Further research is needed to properly elucidate drivers behind the different orientations.

1. Introduction

Climate change and biodiversity loss are frequently presented as the two major environmental challenges of our era. In the scientific community, and frequently also in the media, biodiversity loss is claimed to be causally tied to climate change, although of course the drivers of biodiversity loss are manifold (c.f. Mace & Baillie, 2007; Rands et al., 2010; Sachs et al., 2009). The seriousness of both issues, their prominence in the public discourse, and the potential connection between them, could lead us to believe that concern for these two aspects of environmental threats are part of one general, overarching understanding of current challenges. Such an impression is strengthened by the fact that several large environmental organizations (e.g. the Sierra Club in the USA and Friends of the Earth Norway) highlight both issues and not least the connection between them. There are, however, indications that the picture may be more complex. For example, some of the efforts to stem climate change – e.g. wind farms, hydro power, solar plants, and bio-fuel production – are met with resistance on the grounds that they threaten biodiversity and many other qualities of nature (Aitken, McDonald, & Strachan, 2008; O'Keeffe & Haggett, 2012; Otto & Leibenath, 2014). Factors unrelated to climate change, such as habitat destruction, degradation and fragmentation, are in fact more critical drivers of biodiversity loss (Maxwell, Fuller, Brooks, & Watson, 2016), and could also be conceptually tied to negative landscape change and the loss of natural beauty. If people's concern about environmental issues originate from different frames of experience and are embedded in different worldviews, so that their sense of environmental urgency pulls in different directions, this may contribute to real and potentially desctructive conflicts over environmental solutions. It would also pose a challenge to communication about environmental issues for many actors in the field, including government, NGOs or scientists.

Using a general population sample from Norway, we examine the relationships between concern for specific environmental challenges, including aspects of climate change, biodiversity loss, land use change and habitat degradation. We are interested in the potential existence of *profiles*, and particularly the position of climate change related to other perceived threats. Our aim is not to identify general profiles of "environmental attitudes" including basic value orientations, such as "ecocentrism", "anthropocentrism", "dominance", "altruism", and so on (see e.g. Milfont & Duckitt, 2010; Wesley Schultz et al., 2001). We are

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looking for patterns in people's concern about concrete environmental issues, *all of which* could be seen as problems.

We go on to explore how concern vary across background variables that have previously been shown to affect environmental attitudes (e.g. gender, age, level of education and social class). Furthermore, we examine the relationship between concern and confidence in different actors in the field of environmental politics and governance. Finally, we look at respondents' ranking of climate change and biodiversity relative to each other.

1.1. Climate change

Climate change is regularly described as the largest and most complex global environmental problem currently facing humanity (Brechin, 2010; IPPC, 2014). The scientific consensus on the reality of climate change has grown and solidified in the past quarter century since James Hansen gave his famous testimony on global warming before the United States Congress urging society to take action in order to avoid disastrous future effects (John et al., 2016). The IPPC's fifth assessment report states that it is extremely likely that more than one-half of the global average surface temperature increase during the last sixty years was caused by anthropogenic greenhouse gas emissions (IPPC, 2014).

Although several weather phenomena already occurring – droughts, floods, rising temperatures - may point to the reality of climate change, this threat is still relatively abstract and can be perceived primarily through mediation of scientific research (Russill & Nyssa, 2009; Spence, Poortinga, & Pidgeon, 2011; Weber & Stern, 2011). Yet, and despite skepticism in segments of the public, studies have shown that majorities within countries like USA and Norway acknowledge that climate change is real and partly caused by human activity. This majority seems to be fluctuating, however, and may have declined recently in both Norway (Austgulen & Stø, 2013) and the USA (Leiserowitz et al., 2014; Scruggs & Benegal, 2012). Furthermore, recent political development in the USA, and previously in countries like Canada and Australia, highlights that views on climate change may indeed be diverse in powerful circles, and this is most likely not unrelated to diversity in views held by the public.

1.2. Biodiversity loss

There is broad scientific consensus that biodiversity loss is a global environmental challenge (Dawson, Jackson, House, Prentice, & Mace, 2011). According to research, biodiversity is declining at a steady rate and the pressures on biodiversity are increasing, both at a global scale (Butchart et al., 2010) and in the Nordic countries (Normander et al., 2012). Biodiversity loss depletes large areas across the globe, which are vital for a range of ecosystem functions such as climate regulation, soil and water supply, erosion control, pollination, food production, recreation, cultural heritage, sense of place and education. Ultimately, biodiversity loss threatens human well-being and possibly human existence (Cardinale et al., 2012; Naeem, Chazdon, Duffy, Prager, & Worm, 2016)

Biodiversity is not merely a scientific concept, but also a mental construct that can carry multiple meanings depending on cultural, social and individual contexts (Buijs, 2009; Kaltenborn, Gundersen, Stange, Hagen, & Skogen, 2016, Fischer, Bednar-Friedl et al. 2011; Fischer, Langers, Bednar-Friedl, Geamana, & Skogen, 2011; Valiverronen, 1999). Scientists also take different approaches to biodiversity and may disagree on the relative importance of diversity within and between both species and environments. Experts (and lay people) can also disagree on what constitutes 'nature', i.e. to what extent one should incorporate humans, human practices and artefacts in the concept (Biermann & Mansfield, 2014). Documentation of dramatic loss of biodiversity over the past years has gradually entered the public arena outside the scientific realm and intensified the public discourse on environmental threats. However, the diversity of meanings people attribute to the term is poorly understood (but see Fischer, Bednar-Friedl et al. 2011; Fischer, Langers et al., 2011). How biodiversity loss (however conceptualized) is seen as tied to other environmental issues such as climate change appears to have received even less research attention.

Land use change, landscape modification and habitat destruction are conceptually not the same as biodiversity loss. It is, however, reasonable to assume that concern for the physical transformation of nature including the demise of fauna and flora – being quite obviously related – will be closely linked in people's minds.

1.3. Climate change and biodiversity loss

It is reasonable to say that a hegemonic environmental discourse exists today, with climate change as a centerpiece. However, allusions to a rift between climate change concern as reflected in concrete mitigation efforts and the conservation of landscapes and biodiversity are found in the literature that deals with conflicts between conservation and renewable energy development. Here, the focus is on priorities related to specific projects and areas, where the two issues are pitted against each other (at least in terms of rhetoric) and where one has to lose. Mostly there is a focus on physical impacts, i.e. "conflicts" in terms of specific negative impacts from climate mitigation efforts on biodiversity, and not on more general and fundamental differences in understandings of climate change and other environmental challenges. Despite the localized origins of many efforts to stop renewable energy development, the NIMBY explanation has been generally refuted by research. NIMBY explanations assume that e.g. opponents of wind farms are in favor of wind power in general but oppose it when it is proposed in areas where it impacts on themselves. Yet, the literature has found little evidence to support such explanations and instead illustrates that public responses are highly complex, nuanced and flexible (Batel & Devine-Wright, 2015; Burningham, Barnett, & Walker, 2015). While they may have been triggered by specific development projects, they often evolve into more comprehensive critique of energy development, energy consumption, and even more fundamental aspects of modern societies (e.g. Aitken, 2012; Wolsink, 2000). Although most studies seem to have focused on groups who actively oppose renewable energy projects, the findings indicate the existence of a discourse about renewable energy and nature that diverts from the hegemonic narrative about climate change and what has to be done to curtail it. To a large degree, this is a narrative about technology and the need to produce more renewable energy from wind, hydro and sun, a narrative that fits well with the concept of "ecological modernization", i.e. that economic growth can be maintained if only it turns "green" (see Buttel, 2000; Crist, 2015). There are also various other bases for questioning the rationale behind specific renewable technologies or strategies for their implementation, e.g. that they are ineffective, expensive, etc.

However, the potential existence of cleavages along such lines in the general population has not received much research attention.

2. Research questions

Our objective is to investigate relationships between different aspects of environmental concerns. We also probe how these concerns might be related to background factors and confidence in relevant actors. We found no literature dealing with differences between concern about climate change and concern about biodiversity loss (or concern about transformations of nature that may lead to biodiversity loss), and what background factors might be associated with such differences, should they occur. However, given that all potential concern profiles will be expressions of concern for the environment, we do not hypothesize very diverse relationships with the relatively coarse background factors available to studies such as this one. We therefore aim mainly to establish, by means of an exploratory approach, if different

profiles do indeed exist, and the degree of overlap between them, but we also conduct an open-ended search for connections with independent variables.

To sum up, our aim is 1) to establish the existence of profiles, 2) to probe the relationship between them, and 3) to investigate their relationship with such other relevant variables as are available to us here. We anticipate that more targeted research is needed to explore in more depth the connections between concern profiles and other factors, most notably how concern is embedded in value systems and political orientations, something we have not been able to do in this study.

3. Method and sample

In 2012, 4077 Norwegians aged 18 to 87 completed an online questionnaire with a wide range of questions on climate and the environment. Respondents were drawn from the large nationally representative TNS Gallup panel (GallupPanelet), which comprises approximately 50 000 individuals. The panel belongs to TNS Gallup, and they conducted the sampling and data collection according to procedures specified by us. The survey was not part of an omnibus, and was presented to respondents as a study conducted by the Norwegian Institute for Nature Research. TNS Gallup had no role in data analysis.

Approximately 7000 respondents were contacted, leaving us with a response rate of 57 percent. However, as is customary when using this method, the website was closed when the target sample size was reached. Hence, the response rate could have been higher if everyone who wanted to answer had been given the opportunity.

Panels have the advantage that sampling corrections can be made during the course of data collection, if disproportions are observed. National statistics on gender, age, education level and geography were compared to the sample's social composition. Personnel from TNS Gallup who supervised the data collection concluded that no adjustment was necessary.

The sampled respondents were provided access to the self-administered questionnaire through TNS Gallup's website. This approach has advantages and disadvantages. While effective compared to conventional mail surveys (which often generate a dismal response rate), it may potentially increase non-response bias for some groups of respondents, particularly older people, who are not familiar with Internet use or may not have access. Generally speaking, however, internet access is now close to universal in Norway. 93% of households were connected in 2014, and 95% of the population (age 16–75) were online during "last three months" (SSB, 2015). Still, the technology may favor those groups that are most used to it (Lindhjem & Navrud, 2011). The recruiting process for the panel itself is also subject to attrition. However, considering the declining, and sometimes dramatically low, response rates obtained in mail surveys, and associated non-response bias, there is no reason to believe that web-based panel surveys produce results with a lower reliability.

TNS Gallup had previously stored background information about the panel, providing a data set containing more information about each respondent than we collected through our own questionnaire. This is also an advantage that panels have compared to other sampling methods.

4. Results

4.1. Profiling concern

The respondents were presented with 16 different environmental issues, and were asked how concerned they were about them (Table 1). The response options ranged from "Very concerned" to "Not at all concerned" on a five-point Likert scale.

We conducted an exploratory factor analysis (with principal component Varimax rotation), and found three factors with eigenvalues larger than one. Together the three factors accounted for 621% of the total variance. The results from this factor analysis and descriptives of the items are presented in Table 1. The first factor (which accounted for 45.5% of the variance) is related to climate change but also pollution and biodiversity loss. The second (which accounted for 10.1% of the variance) comprises primarily land use changes ("development"), habitat loss, fragmentation, etc., but also biodiversity loss. The third factor (which accounted for 6.5% of the variance) comprises radiation and toxins in food, i.e. directly health-related issues. While this latter "health" factor is interesting in its own right, we will not discuss it further here, as our purpose is to probe the relationship between concern about climate change and biodiversity loss – and, as it turns out, concern about habitat loss and transformations of nature with potential biodiversity impacts. We label the two first factors "Climate and pollution" (C&P) and "Habitat and landscape" (H&L) respectively.

Biodiversity loss and habitat loss load on both these factors. Biodiversity loss actually loads more strongly on the C&P factor than on the H&L factor, whereas it is the other way round for the item "habitat loss". It appears reasonable to think that in a context where respondents are not required to prioritize, concern for biodiversity loss and habitat loss is reported by many in accordance with the hegemonic discourse on current environmental threats (where precisely these terms are prominent), as described above. However, most interesting here is that specific causes that *lead* to the loss of habitat and biodiversity, *except climate change*, load on a separate factor. Except for the two items that load on both factors, loadings for each item are quite different, also for major climate change items like "general climate change" (.840 vs .212) and "global warming" (.804 vs .256), and major biodiversity items like "habitat fragmentation" (.775 vs .238).

We retained factor scores as variables. We interpret the "climate" factor as encompassing primarily a concern aligned with what we have termed a "hegemonic discourse", and the expression "political correctness" comes to mind. This is not to say that concern for climate change and pollution is not genuine, but simply that this factor contains elements that *actually* align with the hegemonic discourse on environmental challenges, centered on climate change.

We will return to the specific issue of biodiversity loss later, based on a different instrument where respondents are requested to *prioritize* different environmental issues, including climate change and biodiversity loss.

4.2. Concern about environmental challenges and background factors

In the literature, various operationalizations of "environmental concern" have been shown to correlate with a number of background factors (e.g. Gifford & Nilsson, 2014; Newman & Fernandes, 2016). However, relationships are strongly dependent on the definition of environmental concern, and not only which environmental issues are emphasized, but also whether the focus is on factual issues (e.g. "pollution", "recycling" or "species protection"), or on identification with the environmental movement, or voting patterns.

Among the obvious background factors are gender and age. Despite some inconsistency (Fransson & Gärling, 1999) there seems to be a tendency that women are more concerned about environmental problems than are men (c.f. Wesley Schultz et al., 2001). In particular, this applies to aspects of environmental problems related to risk and health (Bord & O'Connor, 1997), and environmentally friendly behaviors (Yates, Luo, Mobley, & Shealy, 2015). Women have been found to identify more strongly with "mainstream" environmental NGOs (McCright & Dunlap, 2015), but are not generally more active there (McFarlane & Boxall, 2003; Tindall, Davies, & Mauboulès, 2003).

A relationship between age and environmental attitudes has not been consistently established. A simplistic hypothesis could be that young people anticipate more severe effects of climate change and environmental degradation in their lifetime – given that they will simply live longer into an uncertain future than will older people – but some studies find that young people are less concerned about the

Table 1
Environmental concerns Rotated Factor loadings from Varimax rotation.

	Rotated Component Matrix					
	Component:					
	1	2	3	Mean	S.d.	N
Climate change in general	,840	,212	,018	2,66	1,27	4064
Biodiversity loss	,634	,494	−,024	3,04	1,35	4054
Extreme weather	,751	,013	,389	2,97	1,32	4060
Pollution of air and water	,645	,296	,334	3,37	1,31	4063
Destruction of nature due to construction, roads, logging, etc.	,439	,591	,166	3,01	1,39	4065
Increased precipitation	,616	,064	,503	2,75	1,32	4063
Raditation from e.g. mobile towers and high voltage grid	,136	,220	,769	2,42	1,33	4063
Global warming	,804	,256	,156	2,82	1,35	4064
Toxins in food	,210	,353	,648	3,27	1,41	4059
Second home devlopment	,099	,727	,200	2,25	1,31	4055
Milder winters due to climate change	,582	,370	,124	2,31	1,28	4055
Loss of habitats for animals and plants	,484	,657	,082	3,12	1,37	4045
Hydroelectric development (i.e new dams & infrastructure)	,158	,703	,208	2,23	1,29	4055
Modern forestry (clear-cuts and heavy machinery)	,183	,749	,167	2,46	1,35	4048
Invasive species	,133	,478	,398	3,10	1,39	4055
Fragmenting of pristine areas	,238	,775	,175	2,65	1,31	4055
Eigenvalue	7,28	1,61	1,04			
% of variance	45,5	10,1	6,5			

environment than are older cohorts (European Commssion, 2014; Grønhøj & Thøgersen, 2009). The latest Eurobarometer report on climate change (European Commsion, 2015) found no difference between age groups in concern about climate change (it was lower than concern for poverty, the economy and terrorism in all cohorts). A survey covering 119 countries did not identify an age effect on climate change awareness (Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015). Potential effects of age still need to be explored in studies such as ours.

Living with children has been assumed to influence attitudes towards environmental problems because parents could be expected to worry about the future wellbeing of their children. Some studies have found this to be the case (c.f. Dupont, 2004; Hoyos, Mariel, & Fernández-Macho, 2009) while others found no relationship (c.f. Schumacher, 2014). However, these (and other) studies have employed different operationalizations of "concern". An effect cannot be ruled out, and we will include this variable in our analysis.

Correlations with background factors are affected by the operationalization of dependent variables, but also of the background factors themselves. This is notably the case concerning the complex category "social class", where income and education often serve as proxies – either because more sophisticated models are not feasible based on a given data set, or because authors are not really interested in class as an analytical category.

Yet, building on the theoretical assumption that modern environmentalism has been predominantly a middle-class (or even *new* middle-class) phenomenon, several studies explored this connection and did indeed find a correlation between environmental concern and belonging to certain middle class segments (Cotgrove & Duff, 1980; Eckersley, 1989; Kriesi, 1989, Author). However, few – if any – survey studies have focused on class and environmental concern in recent years. There is no reason to abandon a class perspective in studies of environmental concern, especially since several of the older studies also struggled with deficient data and class models not well suited to singling out the theoretically interesting segments of the middle class.

Our social class variable was constructed by categorizing occupations according to the ILO ISCO-88 standard (adapted by Statistics Norway, SSB, 1998). Occupations were grouped into the following six categories: Economic and professional elite, technical/economic intermediate strata (TEIS), humanistic/social intermediate strata (HSIS), clerical and service workers, farmers and fishermen, and manual workers. Examples of occupations placed in the TEIS category are engineers, economists and researchers in technology, whereas occupations like physicians, teachers, social workers and artists were placed in the HSIS category. It has proven productive in earlier studies (see Author).

As noted by e.g. Crompton (1993), most reasonable models of social stratification produce relatively similar patterns when used as independent variables as we do here. Unless the aim is sophisticated and theory-driven class analysis, several models can work equally well. However, a particularly salient point in our context is the segmentation of the middle class. In our case, we revitalize a model we used with some success previously (Pedersen, 1996, Author), specifically to allow for the distinction between the two middle-class strata. The HSIS resembles what in some studies has been termed the "new middle class", and which particularly predicted an "environmentalist" outlook and new social movement affiliation (Elder, 1996, 1993; Kriesi, 1989, Author). However, any single measure of class position – like occupation – must be expected to underplay actual class differences (Davies, 1994).

Over the years, several authors have reported a relationship between environmental concern level of education and to some extent income. These correlations are generally not strong, and assumptions about a linear relationship between e.g. income and degree of concern seem to be based on rather simple notions about "post-materialism" a la Inglehart (Inglehart & Welzel, 2005; Inglehart, Basañez, & Menéndez Moreno, 1998). However, for example McCright and Dunlap (2015) did find a modest positive relationship between level of education and identification with the environmental movement, and Lee and associates found educational attainment to be a consistent predictor of climate change awareness (Lee et al., 2015).

Another aspect of social differentiation is what Bourdieu (1984) termed *cultural capital*. For example, [Author] and Fischer, Langers et al. (2011) found that environmental attitudes were related to amount of cultural capital. In these studies, cultural capital was understood as "familiarity with the complicated forms of expression of the dominant culture" (Pedersen, 1996:261), and approximated simply through the number of books the respondent had at home. [Author] postulated that sharing the "modern middle-class notion of nature, which expresses rejection of a utilitarian relationship with nature and the unaesthetic consequences of capitalism" could be seen as cultural capital in contemporary society, given the hegemonic environmental discourse. Indeed, they found that their proxy of cultural capital was negatively related to political traditionalism, and positively to ecocentrism. Similarly, Fischer, Langers et al. (2011) found that number of books to some extent predicted attitudes towards European plants and animals, and

was negatively correlated to the construct "conservation apathy".

Research has shown that confidence in significant actors (such as politicians, government agencies, scientists and NGOs) is associated with views on core environmental issues (c.f. Hammar & Jagers, 2006, Author). This is in line with our own previous work dealing with another topical environmental issue, namely large carnivore management (Author). Confidence in government institutions and mainstream environmental NGOs tend to predict an adherence to the current "dominant paradigm" about environmental challenges, entailing for example concern about issues such as climate change (Hammar & Jagers, 2006), or support for large carnivore conservation (Author). Confidence in informal information sources and actors that do not (necessarily) adhere to the dominant environmental paradigm, such as "ordinary people", local politicians and "common sense" in general, tends to predict less support for e.g. large carnivore conservation (Author).

On this basis, we hypothesized that confidence in different actors in the field of environmental politics and governance could be related to views on climate change, biodiversity loss, land use change, and habitat degradation. The questionnaire contained an instrument designed to measure this. Respondents were asked to indicate how strong confidence they had in a number of actors regarding climate change and other environmental issues. This was scored on a four-point scale ranging from "no confidence" to "very strong confidence". There was also a "not heard of" option, which was coded as missing in a factor analysis. This analysis yielded three factors with eigenvalue > 1, accounting for 59.6% of the total variance. These were very much in line with what we have seen in previous surveys (Fischer, Langers et al., 2011, Author). The results from this factor analysis and descriptives of the items are presented in Table 2 below. The first factor (which accounted for 40.8% of the variance) indicated confidence in public bodies and organizations that we may term the "environmental establishment", including scientists. The second (which accounted for 12.4% of the variance) indicated confidence in economic actors and public bodies not primarily associated with the environment, such as the EU, and we labelled it "political/economic establishment". The third factor (which accounted for 6.4% of the variance) had mostly weak factor loadings, but two items stood out: confidence in "ordinary people who use common sense" and "local politicians". We label it "common sense".

Table 2
Confidence in different actors related to environmental issues Rotated Factor loadings from Varimax rotation.

	Rotated Component Matrix					
	Component:					
	1	2	3	N	Mean	S.D.
Ministry of environmental protection	**,563**	,457	−,119	3937	2,41	0,76
WWF	**,742**	,063	−,044	3853	2,76	0,82
Ordinary people with common sense	−,122	,035	**,864**	3966	2,57	0,83
Climate scientists	**,694**	,245	−,138	3958	2,63	0,79
Parliamentarians	,321	**,721**	,112	3970	1,70	0,69
Biologists	**,676**	,147	−,057	3930	2,87	0,73
The UN's Climate Panel (IPPC)	**,662**	,384	−,226	3862	2,48	0,90
Friends of the Earth Norway	**,826**	,105	,042	3918	2,60	0,89
Local politicians	,133	**,585**	**,522**	3936	1,75	0,72
Sellers of [carbon offsets]	,265	**,703**	,099	3718	1,46	0,63
Bellona (Norwegian environmental NGO)	**,746**	,080	,152	3825	2,41	0,90
The directorate for nature management[a]	**,715**	,304	,029	3749	2,55	0,82
EU	,237	**,692**	−,149	3893	1,80	0,75
Authorities in countries receiving Norwegian environmental aid	,248	**,727**	−,013	3708	1,49	0,62
Economists	−,042	**,697**	,099	3822	1,56	0,69
The climate and pollution agency[b]	**,632**	,463	−,086	3637	2,31	0,79
Eigenvalue	6,53	1,98	1,02			
% of variance	40,8	12,4	6,4			

[a] Merged with the Climate and pollution agency in 2014, forming the Environment Agency.

[b] Merged with the Directorate for nature management in 2014, forming the Environment Agency.

Below we examine how background factors and the confidence dimensions are correlated with the two first environmental concern factors (the C&P and H&L factors, Table 1). In Table 3, we present results from linear regression models (OLS) with the environmental concern factors as dependent variables.

Our aim here is to determine the effects of the background variables and the confidence factor scores on each of the concern variables. If we look at background variables and C&P concern first, we observe that there are positive effects of having a mother with higher education, belonging to the HSIS (in block 2, we also observe an effect of belonging to farmers/fishermen category), being a student, having many books at home, having attained higher education, being a woman and being over 45 years of age.

Moving on to H&L concern, we see positive effects of belonging to the HSIS and "clerical and service workers", being a student, and number of books at home. There is a negative effect of living with children (people who do, are somewhat less inclined to be concerned than people who do not).

Effects of background factors are generally not strong, but for C&P concern in particular, they do point in a direction that confirms earlier studies of environmental concern. For the C&P profile, we see that a family background where mother has higher education, as well as own higher education and belonging to a social segment (here label HSIS) that generally constitutes the core constituency of the environmental movement, are all factors that point to a higher concern for C&P. The effect of cultural capital (here number of books at home), although weak, pulls in the same direction. Women also tend to be more concerned than men, in accordance with previous studies (as outlined above). More surprising perhaps is the age effect, where people above the age of 45 tend to be slightly more concerned than younger people.

If we look at the H&L concern profile, we see contours of a similar pattern. Not all the same background factors play a role here, but if respondents themselves belong to HSIS (or Clerical & service), are students, or have many books at home, there is a tendency that they are more concerned about H&L. Educational level in background family (specifically mother's) does not play a role, and neither does respondents' own level of education. We see no effect of gender, but interestingly – and somewhat surprisingly – living with children reduces the chance of a strong H&L concern.

Despite the (modest) differences between the two concern profiles in terms of the effect of background variables, the main impression is that both are associated with factors that have previously been shown to predict stronger environmental concern. The lack of effect of education (own as well as mother's) on H&L concern is interesting. The effect of social position is also somewhat different, in that belonging to the Clerical & service category (as well as HSIS) indicates stronger H&L concern. Taken together, strong H&L concern could seem to be somewhat less "elitist" than strong C&P concern.

Living with children predicts lower H&L concern, whereas being a woman predicts stronger concern for C&P. This could indicate that the C&P profile is slightly more in line with previously identified "modern environmentalist" orientation (Beck, 1992, 1995; Eder, 1993, 1996), compared to the H&L profile. Yet, the main impression is that the background variables explain a limited amount of the variation, as can also be seen from the modest R square.

When we introduce the confidence factor variables in model 2, we observe interesting effects, some of which are considerably stronger

Table 3
Linear regression (ordinary least squares) with environmental concern profiles as dependent variables.

	Climate & pollution factor 1				Habitat & landscape factor 2			
	Model 1		Model 2		Model 1		Model 2	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Mother higher education	**0,144**	0,053	**0,094**	0,047	−0,008	0,055	−0,028	0,054
Social class (ref. Elite)								
TEIS	0,124	0,091	0,047	0,081	0,094	0,094	0,065	0,092
HSIS	**0,278**	0,097	0,110	0,086	**0,314**	0,100	**0,242**	0,098
Clerical & service	0,124	0,097	0,059	0,086	**0,333**	0,100	**0,310**	0,098
FarmFish	0,273	0,191	**0,355**	0,169	0,058	0,197	0,079	0,192
Manual workers	0,050	0,097	0,071	0,086	0,196	0,100	0,174	0,098
Students	**0,565**	0,123	**0,330**	0,109	**0,298**	0,127	0,219	0,124
Retired	0,063	0,101	0,126	0,090	0,053	0,104	0,095	0,102
Others outside labor force	0,096	0,118	0,151	0,105	0,200	0,122	0,217	0,120
Number of books	**0,035**	0,014	0,006	0,013	**0,052**	0,015	**0,040**	0,015
Yearly income > 400 000	−0,001	0,001	−0,001	0,001	0,001	0,001	0,001	0,001
Higher education	**0,266**	0,047	**0,139**	0,042	0,039	0,048	0,028	0,048
Gender (men = 1, Women = 2)	**0,159**	0,040	**0,075**	0,035	0,016	0,041	−0,020	0,040
Living with children	0,061	0,044	0,006	0,039	**−0,134**	0,045	**−0,151**	0,044
Age (ref. 25–45)								
15–24	0,103	0,085	0,111	0,075	−0,068	0,087	0,000	0,086
46+	**0,111**	0,046	**0,184**	0,041	−0,066	0,047	−0,045	0,047
Conf. environmental establishment			**0,446**	0,017			**0,191**	0,019
Conf. political/econ. establishment			**0,070**	0,017			**−0,119**	0,019
Conf. common sense			**−0,154**	0,017			0,017	0,019
Constant	**−0,794**	0,118	**−0,443**	0,106	**−0,399**	0,122	**−0,268**	0,120
N	2803		2803		2803		2803	
Adj. R2	0,066		0,265		0,016		0,061	

Bold: significant at $p < 0.05$.

than the ones described above. For the C&P factor, we observe a strong positive effect of confidence in the "environmental establishment" (EE), and a weaker but significant positive effect of confidence in the "political/economic establishment" (PEE). There is a *negative* effect of confidence in "common sense" (CS).

For the H&L factor, there is also a positive effect of confidence in EE, although markedly weaker than the one we saw for C&P. There is a modest *negative* effect of confidence in PEE, and no significant effect of confidence in CS.

With the confidence factors in the model, we observe that C&P and H&L diverge more markedly. Confidence in EE is associated with more pronounced concern for both "packages" of environmental challenges, but clearly more so for C&P compared to H&L. While there is a modest positive effect on C&P concern of confidence in what we may perhaps term the "conventional" political/economic establishment, the effect on H&L concern is negative. Confidence in "common sense" is negatively correlated with C&P concern, whereas there is no relationship between such confidence and H&L concern.

This indicates that of the two, the C&P profile is more strongly attached to a perspective derived from hegemonic institutions and based in dominant scientific knowledge, and at the same time denouncing common sense as a source of knowledge about environmental issues. Concern for H&L lacks the negative relationship with common sense, as well as the positive relationship with the PEE, and the positive effect of confidence in EE is weaker. It appears that this concern profile is more independent of the institutional perspective and dominant forms of knowledge that influence the C&P profile.

4.3. Difference between concern factors

In order to examine how people rate the two different aspects of environmental challenge (as expressed through the factor scores) *relative to each other*, we first constructed a new variable by subtracting the C&P factor from the H&L factor. For this new variable, positive values means that C&P concerns are stronger than H&L concerns. In Table 4, we have regressed the same independent variables as in Table 3 on this new «difference-in-concern» variable.

Table 4
Ols, C&P concern score minus H&L concern. Difference factor 1 (C&P) and factor 2 (H&L).

	Model 1		Model 2	
C&P minus H&L	B	S.E.	B	S.E.
Mother higher education	**0,152**	0,077	0,122	0,075
Social class (ref. Elite)				
TEIS	0,031	0,132	−0,018	0,128
HSIS	−0,037	0,140	−0,131	0,136
Clerical & service	−0,209	0,141	−0,251	0,137
FarmFish	0,214	0,277	0,275	0,269
Manual workers	−0,146	0,141	−0,103	0,137
Students	0,267	0,178	0,111	0,173
Retired	0,010	0,147	0,031	0,142
Others outside labor force	−0,104	0,172	−0,066	0,167
Number of books	−0,017	0,021	−0,033	0,020
Yearly income > 400 000	−0,002	0,001	−0,002	0,001
Higher education	**0,227**	0,068	0,111	0,067
Gender (men = 1, Women = 2)	**0,144**	0,058	0,095	0,056
Living with children	**0,194**	0,063	**0,157**	0,062
Age (ref. 25–45)				
15–24	0,171	0,123	0,111	0,120
46+	**0,176**	0,067	**0,229**	0,066
Conf. environmental establishment			**0,256**	0,027
Conf. political/econ. establishment			**0,188**	0,026
Conf. common sense			**−0,172**	0,027
Constant	**−0,395**	0,172	−0,175	0,168
N	2803		2803	
Adj. R2	0,020		0,077	

Bold: significant at $p < 0.05$.

There are no significant differences between the segments in our class model, but those who have a mother with higher education and who have completed higher education themselves, tend to be more concerned about C&P than about H&L. The same is the case for women compared to men, and for people who live together with children. Both the youngest and the oldest age group are more concerned about C&P

relative to H&L, compared to those in between.

Again the confidence factors yield clear effect coefficients, and the introduction of these variables weaken the effects of the background factors. For example, in Table 4, model 2, there is no longer a significant gender difference. The confidence factors display an interesting pattern, in that confidence in the two 'establishment' factors (particularly the environmental establishment) points in the direction of more C &P concern, whereas confidence in 'common sense' does the opposite – the effect is negative.

To sum up at this point, the emergence of separate factors and the relationships between these factors and some potentially meaningful independent variables (particularly confidence) indicates that concern about climate change and pollution, and concern about detrimental transformation of nature are, to some extent, part of different 'packages' of concern for environmental issues.

4.4. Priorities

The respondents were also asked to prioritize different environmental challenges and rank the three they saw as most serious (not the same instrument as we used for the regression in Table 3). Among the items were *climate change* and *biodiversity loss*. The previously reported factor analysis was based on an instrument where people were not forced to prioritize concern for specific issues. It indicated overlap between profiles, and indeed showed "biodiversity loss" to load on both factors. We use the terms here in a different setting: Respondents *must* rank them.

We have sorted the respondents into six groups according to their ranking of the two items relative to each other: The first group ranks climate change on top, but do not rank biodiversity loss among the top three. The second group ranks climate change second or third, and do not rank biodiversity loss among the top three. The third category did not include any of them among their three top priorities. The fourth category ranks biodiversity loss on top, and do not rank climate change among the top three, whereas the fifth category ranks biodiversity loss second or third, but do not include climate change among the top three. The last category comprises those who have included both climate change and biodiversity loss. In Table 5 we can see how the respondents were distributed across these categories.

Interestingly, less than 15% mentioned both issues among the top three priorities, going against a notion that they are widely seen as the two most serious environmental challenges of our time.[1] In the same vein, almost 35% mentioned none of them. 32% mentioned climate change (as 1,2 or 3) without mentioning biodiversity loss, whereas more than 18% mentioned biodiversity loss without mentioning climate change. As we can see, a more polarized picture emerges when people are required to prioritize, and "biodiversity loss" as a concept departs from "climate change".

Table 5
Environmental challenges: Top three priorities.

	Freq.	Percent
Climate top priority, biodiversity not mentioned	568	13.93
Climate a priority (not top), biodiversity not mentioned	740	18.15
Mentioned none of the two	1414	34.68
Biodiversity a priority (not top), climate not mentioned	541	13.27
Biodiversity top priority, climate not mentioned	214	5.25
Mentioned both	600	14.72
Total	4077	100

5. Discussion

Based on these exploratory exercises our main finding is simple, but we think important: Different profiles exist related to concern for a variety of potential environmental threats, and climate change is a prominent factor in only one of them. When people rank environmental challenges according to gravity, concern about climate change and biodiversity loss show little overlap. When respondents are not forced to prioritize, both biodiversity loss and climate change load on one factor that quite neatly confirms to a "politically correct" or hegemonic environmental discourse. However, major factors that *drive* biodiversity loss and that generally have a more direct and probably more dramatic impact, such as habitat destruction in various forms, constitute a factor of their own.

These findings are intriguing, but - not surprisingly - our exploration of their relationships to relatively crude background variables yield limited insights. However, the findings point towards patterns that should guide future research. By way of drastic simplification, we might say that the H&L profile emerges as somewhat less elitist compared to the C&P profile, and less in line with the understanding of the social basis of modern environmentalism developed in earlier scholarship.

Moving on to another level, we see that confidence in various factors in the environmental field clearly does impact the two profiles differently. We do not see confidence as a background variable, but understand it as representing a level of interpretation reflecting respondents' value orientations. When we introduce the confidence factor variables in model 2 (Tables 3 and 4), we observe effects that are considerably stronger than the ones derived from background variables.

Altogether, the introduction of the confidence factor scores in our models strengthen the vaguer impression from the background variable effects. We now have clearer indications that H&L concern – unlike C&P concern – represents a perspective on environmental challenges that to some extent departs from what we have called the hegemonic discourse, and which relates differently to information from certified expert sources (be they government, NGOs or science).

It is well established that different levels of confidence in significant actors (particularly institutional ones), not least as information providers, are related to "environmental attitudes". This touches upon the matter of valuation of scientific or expert knowledge in different social groups, which has been the topic of numerous studies (e.g. Author, Wynne, 1996). A critical stance towards conservation is often accompanied by a lack of trust in scientific knowledge, and a feeling that practical lay knowledge is generally devalued (von Essen, 2015; Wynne, 1996). This has also been a leitmotif in our previous work on conflicts over large carnivore conservation, and has surfaced in quantitative (Author) as well as in qualitative studies (Author).

While background factors do have a certain influence on both profiles, they have very limited impact on the difference between them (Table 4). Given that both profiles express environmental concern, this is not too surprising. For example, both profiles are affected by class background, in line with previous research on environmentalism and class (but again, the H&L profile less so than the C&P profile).There are no class effects on the difference. However, the confidence factor variables retain a certain effect also there, indicating that they are indeed important elements in an explanation of the pattern we see. However, we must keep an open mind regarding causal directions. We cannot say, for example, that lack of confidence in certain institutional actors *leads to* less concern about climate change. While this may be a likely mechanism, an opposite causal link may also play a part. Establishing the link is still important.

Furthermore, we may surmise that our findings could mask a diversity particularly among those who are most concerned about nature degradation. The H&L factor's weaker connection to the variables higher education (own and mother's), and confidence in the environmental establishment, could cover a diversity where many are as highly educated and in general have a similar background as the typical climate concern constituency, but where there may also be a significant

[1] The most common top priority was "toxins in food" (26,9 %), followed by "climate change" (22,0 %).

number who have arrived at their stance from a different starting point, entailing skepticism towards science (e.g. dominant climate science) and modern-day climate-oriented, elitist environmentalism. Not least, it is probable that many people with strong convictions concerning land use and landscape modification have developed these convictions based on specific experience, e.g. related to controversial development projects, forestry practices, etc. While impressions of habitat degradation and landscape change are also shaped by indirect accounts based on science, personal experience is more likely to play a part here. This may or may not be subsumed under a more comprehensive ideological umbrella. A comprehensive perspective (e.g. negative views on renewable energy in our current economic system as climate change mitigation) may be adopted following engagement with specific development projects that threaten landscapes or habitats. This is in accordance with research as well as anecdotal evidence (e.g. media reports) from battles over energy development, such as wind farms, but underlines the need for more research – particularly qualitative studies, as pinpointing the causes behind this (anticipated) diversity is quite demanding by means of quantitative methods.

Even at a very general level, the mechanisms that drive the development of divergent profiles of concern for environmental problems can only be determined through further research. Since this research also needs to be exploratory in nature, again a qualitative approach is called for. This would be important in its own right to identify and explain interpretations of environmental threats, but also to pave the ground for targeted survey studies, equipped with more sophisticated measures of relevant aspects of environmental concern, and including more measures of mediating factors that may be identified in qualitative studies.

Our contribution here has been to confirm a suspicion that concern for climate change and concern for landscape and habitat degradation are not necessarily part of the same package, and that even concern for biodiversity loss may part ways with climate change concern when people prioritize. We think this is a good foundation for future work. Understanding environmental concern in its context of different worldviews and experiences is essential if we are to understand environmental concern – for example as a basis for action – at all. This is clearly not only of scientific interest, but could have crucial implications for communication about the major environmental issues in our time.

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