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ABSTRACT: One of the most popular measures of ecological worldview, predicting environmental attitudes and behaviors is the New Ecological Paradigm (NEP) Scale developed by Dunlap and Van Liere has been applied to measure children's environmental attitudes across cultures. There is however some controversy about the cross-cultural applicability and the relevance of the NEP scale items. This article reflects on the case study of 59 Dutch school children between the ages 10 and 12, probing their comprehension of the NEP scale through focus group discussions and in-depth interviews. It appears that some items in the NEP scale appeared ambiguous revealing differences in cognitive beliefs (knowledge) and affective states. On the basis of this study, the author calls for a deeper ethnographic analysis of the socio-cultural context in which the children form their worldviews to complement and deepen the largely quantitative studies. In conclusion, it is suggested that qualitative approach adds contextual complexity to the otherwise sound system of measurement, allowing probing of theories about the influence of social, political and institutional influence in shaping environmental attitudes.

Key words: Environmental attitudes, Environmental sociology, Focus groups, Interviews

INTRODUCTION

While anthropology has historically dealt with subjects ranging from native belief systems and the interaction between humans and their environment, the measurement of environmental attitudes were left to the more quantitative social sciences. Studies of environmental views come from a wide variety of fields including sociology, psychology, teacher education, and the life sciences (see for example Wals, 2009; Chawla, 1999; Kahn, 1999; Pilgrim *et al.*, 2008), contributions by anthropologists are surprisingly scarce (Efird, 2011; Kopnina and Shoreman-Ouimet, 2011). Studies measuring environmental awareness by school and college students are still limited to sociological, pedagogical or psychological studies (Reid et al, 2008; Miller, 1975; Eagles and Demare, 1999). Instead of providing a complementary perspective on quantitative studies, anthropologists seemed to have shied away from any 'measurements' and preferred to carry on with their specialty of case studies, participant observations and 'thick description' (the term coined by Clifford Geertz) in domains unoccupied by their more numerically-prone colleagues. Yet, as the author, herself an anthropologist, would argue, there is enough to be added by anthropologists to the existing scholarship of environmental values that could strengthen, complement, challenge and sometimes contradict more 'exact' social sciences. This article is an attempt to bring anthropology closer to measurement of environmental attitudes and to simultaneously enrich the interdisciplinary depository of studies of the cultural variants in perception of environment in children.

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From the nineteen eighties, studies of environmental attitudes in children and young adults were concerned with perceptions of specific local environmental issues, such as energy use at home (Pallak *et al.*, 1980) or pollution and the misuse of natural resources (Iozzi, 1981). More recent efforts have moved away from local approaches to broader conception of our relationship to nature (Mayer and Franz, 2004: 503). Broader conceptions included relationship between pro-environmental views and personal values (Schultz & Zelezny, 1999); cultural values and environment (Stern & Dietz, 1994; Stern, 2000).

Translation from beliefs, attitudes, views and values to actual behavior was developed by Paul Stern, Tom Dietz, and other colleagues who pioneered their widely used value–belief–norm (VBN) model of environmental concern and behavior (Stern *et al.*, 1995 and 1998). Various techniques were used for the study of green values and bahavior in children and

adolescents, such as a behavior-based attitude scale, which is based on people's recall of their past behavior (Kaiser *et al.*, 2007).

Psychologists, focusing on the issues of human choices and actions, had much to contribute to the issues of environmental sustainability (Mayer and McPherson, 2004:503). Social psychologists interested in environmental sustainability have applied knowledge from the research literatures on attitudes (Kellert, 1993; Rauwald & Moore, 2002), conversion of environmental intentions to environmental behaviors (Gardener and Stern, 2002; Evans *et al.*, 2007; Kaiser, 2004), responsible environmental behavior (Hines *et al.*, 1987), behavior-based environmental attitudes (Kaiser *et al.*, 2007), moral reasoning and persuasion (Davis, 1995; Evans et al, 2007; Kahn, 1999; Kellert, 1995), reasoning about environmental dilemmas (Kahn and Kellert, 2002), commitment (Pallak *et al.*, 1980; Werner *et al.*, 1995), normative influence (Aronson & O'Leary, 1982; Cialdini et al, 1990), and incentives (Levitt & Leventhal, 1986).

A number of measuring scales were developed to measure environmental knowledge, attitudes and behavior. Maloney, Ward, and Braucht's (1975) developed a scale of adult environmental attitudes was developed based on measurements of behavioral commitments, affective states, and knowledge. Wiegel and Wiegel (1978) have tested and endorsed the reliability and validity of the Environmental Concern Scale, a 16-item Likert scale assessing respondents' concerns about conservation and pollution issues. The General Environmental Behavior (GEB) Scale was developed (Kaiser, 1998; Kaiser & Biel, 2000).

Connectedness to nature, or 'the extent to which an individual includes nature within his/her cognitive representation of self' (Schultz, 2001) was measured by the 'inclusion of nature in the self' scale (INS). This is a single item measure consisting of seven pairs of circles, ranging from 'me' to 'nature', whereas the respondents are asked to choose the pair that best represents their sense of the world. Mayer and Frantz have developed the connectedness to nature scale (CNS), a 'measure designed to tap an individual's affective, experiential connection to nature' (Mayer and Frantz, 2004:504).

The New Ecological Paradigm (NEP) Scale was developed to predict environmental attitudes and behaviors and to measure people's shifting worldviews from a human dominant view to an ecological one, with humans as part of nature. The Dominant Social Paradigm (DSP), positing endless progress, growth, abundance and attitudes contributing to environmental degradation, is then opposed to the New Ecological Paradigm (NEP), which highlights the disruption of ecosystems caused by modern industrial societies exceeding environmental limits (Dunlap & Van Liere, 1978). In NEP, nature is seen as a limited resource, delicately balanced and subject to deleterious human interference.

Additional elements were added to the original scale, included the balance of nature, anthropocentrism, and limits to growth expanded by adding new dimensions, human exemptionalism (the idea that human beings are exempt from constraints of nature), and ecocrisis (concerns about the occurrence of potentially catastrophic environmental changes (Dunlap, 2008). The 15-item NEP scale, which consisted of eight items assessing an ecological—'humans as part of nature'—view, and seven items assessing an anthropocentric—'humans as rulers over nature'—view. For example 'humans are greatly mistreating the environment' is an ecological item and 'humans will someday learn enough about how nature works to be able to control it' is an anthropocentric item. The NEP scale was applied in standardized, national-level NEP scores for 36 countries and correlated with a wide range of national characteristics and national-level scores on several social-psychological characteristics obtained from prior cross-national studies.

Williams and McCrorie (1990) and Leeming and Dwyer (1995) developed the scale for measuring first to seventh graders behavioral commitments, affective states and knowledge about the environment based on NEP scale. However, this scale was based on outdated notions of environmental issues and included that falls outside of children's volitional control (e.g., for example, driving a car or choosing to take a bus) and might have difficulty comprehending (Evans *et al.*, 2007: 638). Musser & Diamond (1999) have developed an assessment tool for young children that do not suffer from inclusion of items young children have no discretion over and included updated items related to current environmental problems.

Manoli, Johnson, & Dunlap (2007) using a standard Likert-type format of NEP scale with wording changes to make it suitable for use with upper elementary school-aged children. The authors validated the modified NEP scale and suggested that a 3-dimensional modified NEP Scale for Children, with 10 instead of 15 items and revised wording, is appropriate for use with children aged 10-12 years. These items, listed in Manoli et al. (2007:9) were:

1. Plants and animals have as much right as people to live.
2. There are too many (or almost too many) people on earth.

3. People are clever enough to keep from ruining the earth.
4. People must still obey the laws of nature.
5. When people mess with nature it has bad results.
6. Nature is strong enough to handle the bad effects of our modern lifestyle.
7. People are supposed to rule over the rest of nature.
8. People are treating nature badly.
9. People will someday know enough about how nature works to be able to control it.
10. If things don't change, we will have a big disaster in the environment soon.

MATERIALS & METHODS

The study was conducted among 59 students between the ages 10 and 12 recruited at two select state-owned schools in Amsterdam area, The Netherlands, between April and June 2010. Recruitment was facilitated by the fact that these were the same schools the researcher's children attended and that parental consent was obtained from the parents the researcher personally knew. Six focus group meetings were held in groups of pupils in mixed age groups, followed up by 15 in-depth interviews. Consequent research will include larger and more stratified sample. Obvious sample limitations can be noted, including small sample size, a self-selection bias (the fact that children and parents more interested in environmental issues volunteered to participate) and characteristic of the sample itself having to do with the fact that both schools were located in the predominantly 'white', well-to-do areas of Amsterdam. Studies of migrant groups in the Netherlands reveal large inter-generational behavioral differences between, for example, the Turks (for example Bengi-Arslan *et al*., 1997). Cross-cultural studies on children's attitudes in more ethnically heterogeneous schools might offer very divergent data and valuable insights. The focal question of the focus groups and interviews was comprehension and discussion about 10 items of the NEP scale, presented above. The items were read out one by one by the discussion leader. In group discussions, having explained the goal of an exercise, the researcher herself stayed 'away' from discussion and just recorded the speakers. The goal of the discussion was, in the case of focus group, to generate peer-group dynamic and discover common as well as divergent views; in the case of interviews individual differences in perceptions were sought. During the interview, the interviewer took a more active role, specifically focusing on the question of how does the child himself (thinks) to arrive at certain opinions. Generally, the researcher does not position herself as an authoritative or objective 'expert' while interacting with participants, paying tribute to the self-reflective, subjectivist tradition of postmodern anthropology. The researcher's own 'involved' approach attempts to deploy both the subjective dialogue and personal activist position in eliciting participants' responses. This activist position refers to the ultimate goal of this research, namely understanding the comprehension of 'ecological' or anthropocentric items by the children. We shall discuss only three items, as anthropological notes and analysis typically take up a lot of space and would be impossible to fit in one article. Selected items were chosen because they are representative of the various attitudinal/ affective sub-themes supposedly evoked by the scale. Particular focus group and interview excerpts were chosen for analysis because the author deemed them representative of the full "texts" using analysis method of concept mapping. The results from the focus group meeting and interviews were aggregated and analyzed, using Kane and Trochim's methods (2006). First, the means of the importance ratings the participants assigned to each statement were calculated at an age group level. Secondly, multi-dimensional scaling techniques and cluster analysis were used to calculate how often statements were grouped into the same cluster. This resulted in a two-dimensional point map for each group. On these maps statements that were more often placed under the same theme by the group members are located closer to each other. The researcher selected the final number of clusters based on the proximity and the content of the statements depicted on the maps. Average importance ratings were computed for each cluster and labels were assigned to them based on the names proposed by the participants. Statements reported below were placed centrally in the concept maps thus suggesting their prominence. Complete results of this study will be reported in the forthcoming book Anthropology of Environmental Education (Kopnina, 2011).

RESULTS & DISCUSSION

Extract from the focus group discussion, 9 children (FGD):
[Barbara, 11]: I think so.
[Sacha, 10]: There are too many.
[Tim, 11]: There are too many in Amsterdam! [Laughs]
[Barbara] [to Tim]: Do you know how many there are?
[Tim]: In Amsterdam?
[Barbara]: No, on earth!
[Tim]: I don't know, too many.
[Dan, 11] [to Tim]: How can you say too many if you don't know how many?
[Tim] [aggressively]: You know how many?
[Dan] [authoritatively]: 7 million.
[Tim] [smugly]: Billion!
[Barbara, Sacha, Dan and Dora, 11]: 7 billion!
[Tim]: That's too many.

[Dan]: Too many for what?
[Tim] [starts saying something, interrupted by Barbara]: Too many to have enough food!
[Tim] [defensively, to Barbara]: You look like you have enough food!
[Aggressive exchange, laughing. Sacha interrupts]: There isn't enough food in Africa!
[Tim]: So, you go and work for that… that organization that… helps… Africa.
[General unrest, interrupted by the group moderator, waving the paper with item 1 on it. Dora, timidly]: There are too many people to have enough food for everybody…

Extract from interview 1 [Alice, 10]: I think there are too many people… I don't know how many exactly. Maybe more than a billion.
Interviewer: Is it good or bad?
Alice: I don't know.
Interviewer: Why do you think there are too many?
Alice: Because there isn't enough… space for everybody… Also for animals.
Interviewer: How do you know that?
Alice [uneasily] What do you mean?
Interviewer: That there isn't enough space?
Alice: Well, it's just that I saw forest being cut and all animals leaving… on TV… My dad says it's all… exaggerated.
Interviewer: He says there's enough space for everybody?
Alice: No, he says there is enough forest.
Interviewer: What about your mum?
Alice: I don't know… She never talks about this… stuff.
Interviewer: And in school, do you talk about this stuff?
Alice [enthusiastically]: Oh yeah! We watched a film… I don't remember which one… it was about the monkeys, I mean apes, and the forest…
Interviewer: Was there something in the film about too many people?
Alice [puzzled]: No…

Extract from interview 2. [Claire, 12]: I read somewhere that not enough children are born in The Netherlands.
Interviewer: Where did you read it?
Claire: I don't know… It was in a newspaper, that Dutch women don't have enough children. But the migrants have more children, so actually there are enough children being born…
Interviewer: Enough for what?
Claire: Oh, for… I don't know exactly, but I think… What they mean is… That we need to have more people working, so that the economy… I don't know exactly, but I think you need more people in The Netherlands to keep… economy going.
Interviewer: How do you think economy is related to population?
Claire: Oh, I… I don't know for sure, but I think if you don't have enough people, economy would not grow.
Interviewer: Is this a bad thing that economy would not grow?
Claire: Yeah, it's bad…[Uncertain]: Is it?
Interviewer: I don't know, I just want to know what you think… What about outside The Netherlands, are we getting close to having too many people on earth?
Claire: No… I don't know… You mean, how there are too many for nature?
Interviewer: What do you mean by that?
Claire: That if there are too many people, more nature is being used… But [sounds assertive] we also need people to save nature.
Interviewer: Is this your own idea? Or did you also read about it somewhere?
Claire: It's what our teacher says, she says we actually need more people to save nature.
Interviewer: Do your parents talk about it?
Claire: I don't have a dad, but mum says people are more important.
Interviewer: More important then what?
Claire: Just… We need to care for people. There is too much fuss about the animals.
Interviewer: Do you agree?
Claire: I don't know.

Item 4. People must still obey the laws of nature.

Extract from the focus group discussion, 12 children:
[Tim, 10]: You mean, like the rule of the jungle? [Others laugh]
[Bracha, 11]: No, it's like the laws of nature in physics! [Doubting exchanges from other]
[Focus group moderator, FGM]: Any further ideas on what 'the laws of nature' may be?
[Bert, 10]: Maybe it's the animal… Kind of like animals behave… [Others snort, shrug, giggle, Bert shifts uncomfortably in his chair but then raises his hand to speak]: People are also like animals, so….
[Tim]: Maybe you are, you're like… you look like a wombat [general amused noise]
[FMG] No name calling! I repeat: 'People must obey the laws of nature', who else wants to contribute?
[Bracha]: Human law is not the same as nature law…
[Tim]: Now, seriously, I think maybe it's like what Bert says: we are like animals… Nature is important for animals, like what whether there is, what climate…
[Hans, 12]: Maybe they mean animal nature, not climate and stuff… [after FMG's probing]: Well, I don't know , but maybe it's like humans have their emotions, and eh… anger, they also can do a lot of things, like build

stuff… That's what animals also do… Maybe it's kind of like unnatural for humans to… I don't know…
[Tim]: To like study at school? [amused reactions, after FMG's addressing the previously inactive members of the group, long pause].
[Fatima, 11]: I think people should obey nature because otherwise nature will punish them.
[Tim]: What do you mean, punish?
[Fatima]: I don't know, maybe there will be floods… You know, like with climate change, what our teacher said…
[Tim]: Yeah, like the end of the world! [amused reactions, FMG's disciplining intervention]
[Nabil, 12]: I think we should respect nature… Otherwise nature would… strike back…
[Bert]: Ans also like – we are part of nature… But I don't know what they mean by this.

Extract from interview 1. [Simone, 12]: Laws of nature are not the laws that people make. Laws of nature govern the people, but people think… that they govern nature.
Interviewer: You seemed to have thought about it well!
Simone: Naa, my father talks about it often… He says, we should not temper with nature… My mum doesn't like it, she says it sounds patronizing… It's like you're telling people not to be people.
Interviewer: And what do you think yourself?
Simone: Mmm, I guess it's not like people should or they shouldn't… it's not like somebody tells them… what to do. I mean, I don't believe in God or anything… I guess if people obey their own laws, like human laws, that's also good, because then there is… Then people don't get into, like, conflict situations and everything. I mean, I don't really see how we can obey nature… now that we live in big cities and there are many people… You need to have human laws, not just nature laws. [Long pause] I don't really know what the laws of nature mean to… humans now.
Interviewer: And in the past?
Simone: Yeah, in the past I think it was more so, I mean people had to hide from the rain and thunder, they believed in all these gods that control the weather, they had to hunt… In the past people feared everything, God and nature…. Now you get everything from the supermarket, we cultivate, like, everything we eat… Everything we grow… agriculture… it's stronger now, like with the GM – genetic or how do you call them – food and everything, if there is rain or draught it doesn't matter that much. Also houses – almost everybody has a place to live now… I don't know about the homeless – it may be their own choice… But most people are not worried about being flooded in their home… It's secure. Yes, people feel secure, they don't worry about food. I say, we are not as dependent on nature any more…. But I think nature is still stronger then us.

Item 2. What emerged was the complex pattern of individual differences in interpretation of the NEP scale item on population. Children's comprehension of the item was quite ambiguous, as their cognitive beliefs, derived from social, institutional and other sources, did not always link, in the case of the first item, population to environment, or in the case of second item, the 'laws of nature' and human behavior, or in the case of the third item, knowledge about (resilience) of nature and the effects of 'our modern lifestyle'. We may also argue that terminology used, such as 'laws of nature' or 'modern lifestyle' was not always clear. The focus group discussion centered around both effective values and cognitive beliefs, as the children both 'felt' that there were 'too many people on earth' and had a certain value judgment about it – and in some cases, knew how many there were but did not feel it was either 'good' or 'bad'. From the focus group extract, Item 1 is seen as 'anthropocentric' as the discussion turns from 'too many people' (implicitly 'for nature') to too many people for human wellbeing ('not enough food').

In the first interview segment, the girl linked information about animals and forest to human population, but the connection was unclear to her. In her case, the source of information was the media and the parents. While informed through the media about the effects of population growth on deforestation, the father of the respondent seems to exhibit the anthropocentric position but the child herself is swaying in her opinion. Similar case can be made about the second respondent's mother and her own attitude. In the second interview segment it appears that the 12 year old girl links population with economy, yet the connection is not clear for her and she tries to unlock the response of the interviewer, an authority fig. The respondent feels uncertain about her knowledge, especially in regard to effective value of human population, whether the population growth is 'good' or 'bad' and in relation to what (economy, on the one hand, nature on the other hand). Unlike in the first interview, the sources of information seem to be unidentified books and a school-teacher. We may note that both interviewed children exhibited a kind of 'transitional mentality' and the need for authoritative confirmation (in this respect, of the interviewer) of their beliefs.

In other focus group fragments and interviews not reported in this article, 'Africa' (particularly in the context of poverty and 'not enough food') was mentioned by children in 2 focus groups and during 8 interviews. Only one child in the interview indicated

that there are 'too many people' in Africa'. It would be interesting to know what do Zimbabwean children, for example, think about the subject of overpopulation. The bigger question in this respect may be whether children from different cultures might have even more divergent than these inter-personal differences. Another question that needs to be explored in consequent research is how the information sources – the social, institutional or others – play a role in shaping the children's world-view, and how 'transitional mentality' may evolve as different cohorts of children are examined. While the NEP scale for children can be a very useful tool in measuring cognitive beliefs, the comprehension of items on the NEP scale by the children needs to be tested before the standardized answers can be usefully interpreted and analyzed.

Item 4. In the focus group segment, dominated by 11 year old boy, Tim, who seemed to try to impress his classmates, a number of interesting questions pertaining to the children's understanding and definition of 'natural law' comes to the fore. The children try to think what this law exactly refers to (is it the law that governs nature outside humans, does it include humans, or is it similar to the laws that govern humans themselves?), or what it can be opposed to (like 'human law'). The discussion of whether humans are like animals is interesting in the context of NEP theory, human exceptionalism and anthropocentrism. Various points are being raised, ranging from the fear of nature's 'punishment' to the idea that humans are still vulnerable in the face of, for example, climate change. However, the ambiguity of the discussion, especially in the socially dynamic group, seems to suggest that Item 4, particularly the term 'natural laws' is not clear.

In the interview segment, the 12 year old girl Simone articulates that she believes both that the laws of nature apply less in industrial modern society due to technological innovations (such as 'strong' agriculture, GM foods) and complexity of human society that cannot just be governed by natural laws. However, while this seems like a clearly Western Dominant Paradigm point, Simone also reflects that 'nature is still stronger' then the humans. As in the case of the focus group discussion, it seems that respondent is not 'fixed' by one point of view or the other but rather shifts between the idea that either nature or humans are 'stronger' or may dominate each other.

Simone makes a clear distinction between 'now' and 'then', with the present being dominated by the lack of religious beliefs and fear (of both god and nature, as the child eloquently put it), with supermarkets and houses and the needs for hunting and shelter with associated dependency on environment, is greatly reduced. According to Simone, people are 'secure', and yet she reflects that this security can be a feeling, rather then a fact.

Simone's reference to her parents' opinion is also worth noting as she finds herself shifting between her father's asserted warning against 'tempering with nature' and her mother's stance that such a position is 'patronising'. The interview shows a great amount of critical thinking, but also ambiguity in relation to the term 'law of nature' and openness to new ideas.

Reflecting on this data, we need to examine its implications for NEP. However, NEP was criticized for being an inadequate measure of one's affective, experiential relationship to the natural world, as it seems to measure cognitive beliefs rather than affective experience (Mayer and Franz, 2004:505). NEP scale for children items contain statements like 'We are getting close to having too many people on earth' (adopted by Van Petegem and Blieck, 2006) taps a cognitive belief or factual knowledge about human population, not an emotional reaction to nature. One of the findings of the research conducted by the author is that it is both the knowledge of population facts and their interpretation, as well as knowledge of nature's strength and resiliency appears ambiguous in 10 to 12 year old Dutch children.

Secondly, there might be problems with the items applicability of the NEP scale. Manoli et al concluded themselves that caution must be used when interpreting the findings as the results of their research may not apply to children in other locations since the authors cannot generalize their results until we and other researchers have conducted further studies with children from other backgrounds and in other locations (Manoli *et al.*, 2007:11). Lalonde and Jackson (2002) suggested that the NEP Scale has outlived its usefulness and that the original NEP Scale were overly simplistic and outdated. In their sample of highly educated professionals, Lalonde and Jackson found respondents who questioned the usefulness of the items in the scale, for example a philosopher had problems with an item "that assumes humans and nature are distinct entities" (Lalonde & Jackson, p. 32), and a biologist had problems with another item and asked, "[A]re we talking about the physiological 'balance' of an individual organism, the ecological 'balance' of an ecosystem, or the 'balance' of fundamental laws of 'nature'?" (p. 34). Dunlap (2008) responded to this criticism by asserting that although these are understandable and intelligent responses from highly educated experts, it is difficult to imagine how one can phrase revised items to account for, for example, dynamic equilibrium of ecosystems that could

be used with representative samples of the general public whose technical knowledge of ecosystems is very limited. Thus, although Dunlap did not denying that individual items can be improved and updated, he found Lalonde and Jackson's (2002) critique to be unhelpful except to researchers who plan to conduct studies of highly educated and trained specialists in environmental issues (Dunlap, 2008: 10). However, as the author of this article needs to stress, the comprehension of items on the NEP scale by the children needs to be tested before the standardized answers can be usefully interpreted.

Another critique stems from the cross-cultural applicability of the NEP scale as the conceptualization of ecological worldviews may not be applicable outside of the developed Western nations (e.g., Chatterjee, 2008). While some studies supported cross-cultural validity of NEP scale (Kahn, 1999; Bechtel *et al.*, 1999; Vikan *et al.*, 2007; Bechtel *et al.*, 2006), others seem to suggest that the items are not always 'translatable' outside of Western countries. A number of studies in Eastern European nations (Gooch, 1995) and Latin American nations (e.g., Schultz & Zelezny, 1998) have found lower levels of internal consistency and more difficulty with respondents' understanding of some items than have studies in the United States and western European nations. In industrialized societies, acceptance of the NEP implies a clear rejection of the anthropocentric views of the DSP, whereas in less industrialized societies, such as Mexico and Brazil, the distinction between the two worldviews may not be as clear-cut, implicating a holistic view of the human–environment relationship (Bechtel *et al.*, 1999; Corral-Verdugo & Armendáriz, 2000).

In investigating cross-cultural environmental worldviews in children, Van Petegem and Blieck (2006) used the revised NEP scale for children aged 13-15. By administering the scale to children in Belgium and Zimbabwe, the authors found statistical differences between the two subgroups in their perspectives on human-environment interactions. While in the study applying revised NEP scale for children aged 10 to 12, Manoli et al. (2007), examined children's comprehension of the scale through interviews (words that the children didn't understand were replaced by easier and more familiar synonyms, with 672 American children validating the revised NEP scale), no such rigorous validation occurred for this study. Van Petegem and Blieck, having conducted the study among 613 Belgian and 524 Zimbabwean pupils, have only tested the comprehensibility of the scale 'with only a few children', reflecting that in future research this should be validated more widely (Van Petegem and Bliek, 2006:629). This is particularly surprising because the differences in perceptions between West European and African nation can be very large. Deeper ethnographic study focusing on socio-cultural factors influencing the children's comprehension of the items scale seems warranted.

Another remarkable feature of such cross-cultural NEP scale studies is the interpretation of the differences in ecological views found across nations. In Van Petegem and Blieck's study, the authors found that children in Zimbabwe and Belgium display similar ecological worldviews but differences occur at the human dominance dimension. Respondents in Belgium believe in human-nature equality, whereas Zimbabwean youngsters feel more dominant over nature and emphasize a utilitarian view of the environment. Unlike the Belgians, he Zimbabwean respondents displayed faith in the problem-solving abilities of science and technology and in the strength of nature to recover from human interference. In line with Wells & Lekies (2006) theory, Van Petergem and Blieck speculate that these differences could be explained by distinct experiences of the natural world acquired in early childhood as these influence environmental concern. To support the hypothesis that the early childhood encounters with nature are crucial for development of positive environmental values is supported by retrospective reports of environmentalists, which are replete with stories of early and memorable encounters with pristine nature (Kahn & Kellert, 2002). Relating this to the case study of the Dutch children, most of which grew up in a country that lost some 90% of the original forest in the Medieval times already due to agricultural developments and presently reside in the most highly populated countries in Western Europe, we would expect that their environmental values and attitudes will be low. This might be said to be in stark contrast with the experience of children growing up in developing countries who might have witnessed their pristine environment being encroached upon by western development, and yet exhibiting low environmental awareness (Kopnina and Shoreman-Ouimet, 2011). In line with Louv's reflective book, *Last Child in The Woods* (2005), however, we may speculate that the developed-country children grow up with a very different kind of environmentalism, based on distant knowledge, rather than experience (Louv, 2005:1).

Remarkably, however, Van Petergem and Blieck consider no theories about the influence of social context (the influence on children's world views of parents, peer groups) or political and institutional context (the role of the government-sponsored information, media, and the education itself). Once

again, an anthropological gaze could tackle these influences and help sociologists to develop more grounded and justified analysis of cross-cultural differences.

CONCLUSION

As outlined by Evans et al (2007), an important and unknown topic is the origin of young children's environmental attitudes and ecological behaviors. Parental environmental attitudes and behaviors may eventually play a role in shaping the development of children's environmental attitudes and behaviors. How and when this occurs is an important question worthy of scholarly attention. … How children come to frame environmental issues for themselves and then translate these beliefs into actions have critical implications for the future of our planet. Research on this important topic is truly in its infancy. Much important, path-breaking work lies ahead (Evans *et al.*, 2007:657).

In pondering how the Dutch children arrive at their environmental world-views, we may propose a number of possible sources, all of which will need to be studied in greater detail in subsequent research. Social sources may include the parents, the peers, and the educators. Media and literature sources may include study books, television, and (children's) journals and magazines. Institutional sources may include (environmental) education. Consequent research needs to address these sources of information as well as differences across ethnic, level of education (of the parents), and age variables to understand how the environmental knowledge and attitudes of children are being formed. It appears that the children selected for this research respond ambiguously to selected NEP scale statements. While the author is not trying to suggest that the entire format of NEP is flawed and that it should be replaced with a more qualitative, ethnographic method of getting at environmental understandings and attitudes, findings of this study suggest that the combination of NEP scale AND qualitative, context-specific, critical probing (both socially embedded, as in focus groups, and individual, as with interviews) would be better suited for testing both children's knowledge and affective states. Qualitative probing in cross-cultural contexts could also lead to a better phrasing of NEP items to get a fuller, clearer response. In line with the observation that the NEP scale is not an adequate measure of one's affective, experiential relationship to nature because it measures cognitive beliefs rather than effective experience (Mayer and Franz, 2004:504), the author found that in case of Items 2 and 4 that both the knowledge of scientific facts and their effective interpretation appears ambiguous in Dutch children. It might be too premature to analyze cross-cultural or cross-national studies using NEP scale for children before items are tested in each cultural or national setting through ethnographic research without careful contextual qualitative analysis. Quantitative tools for eliciting and evaluating environmental attitudes like NEP can be somewhat reductive and confusing unless supported by in-depth ethnographic, context specific studies. However, when strengthened by qualitative studies, such measurements of environmental awareness can be a crucial starting point for deeper understanding of environmental attitudes in children and possibly for developing educational programs that could strengthen the development of environmental values.

Theories about the influence of social context (the influence on children's world views of parents, peer groups) or political and institutional context (the role of the government-sponsored information, media, and the education itself) theory need to be further addressed. Qualitative approach, probing children's beliefs as well as socio-cultural context in which such beliefs are being formed, including sources of knowledge, may add a great deal of depth to the otherwise sound system of measurement.

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