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Environmental Attitudes of Pre-service Teachers: A Conceptual and Methodological Dilemma in Cross-Cultural Data Collection

Kevin Watson
University of Western Sydney
Australia

Christine M. Halse
University of Western Sydney
Australia

Human generated environmental problems are significant issues of global concern. Despite this, varying attitudes towards environments continue to exist across the globe, impacting on environmental decision-making and action at local, national and international levels. This paper probes some of the similarities and differences in environmental attitudes amongst pre-service teachers in Australia, Republic of Maldives and Indonesia. Data were collected using an established environmental attitude questionnaire and individual interviews. The three communities exhibited a similar range of environmental attitudes using the established questionnaire but significant differences emerged when the interview data were analysed phenomenographically. These differences reflect diversity within and across cultural groups that cannot be satisfactorily explained by the theory underpinning the established questionnaire. Consequently, a revised conceptual framework is proposed.

Key Words: Environment education, Attitude, Cross-cultural, Methodological, Phenomenography

Background

One of the greatest problems facing Earth at present is the impact of humans on environments (Arcury & Christianson, 1990; Stern, Dietz, & Kalof, 1993). Experts argue that the environmental problems caused by human development, such as global warming, the destruction of rainforests and threats to biodiversity, have reached an unprecedented scale and complexity in world history (Dunlap, Van Leire, Mertig, Catton & Howell, 1992; UNESCO, 1997). Since the 1992 World Environment Conference in Rio de Janerio, a succession of international environmental conferences have acknowledged that the threat to the Earth's ecosystems are global problems that need to be viewed and solved cooperatively by many people from a range of cultural backgrounds (UNESCO, 1997). Even when there is agreement to cooperate on environmental problems at an international level, achieving cooperation is another matter. Regional, national and local political and economic agendas come into play or are affected by unanticipated cultural differences across national boundaries. In the worst case scenario, faltering efforts cause tension and delay action, or goodwill and cooperation dissolves into a tense stand-off and defiant non-compliance.

A number of environmental researchers have endeavored to develop a theoretical framework that explains the nature and shifts in the environmental attitudes of people and society. Catton and Dunlap (1978, 1980) argue that a Human Exemptionalist Paradigm (HEP) has characterized western societies. The central thesis of this paradigm is that humans have exempted themselves from the laws of nature and installed themselves as rulers over the natural world. The

Kevin Watson, Senior Lecturer, School of Education, the University of Western Sydney and Christine Halse, Associate Professor, School of Education, the University of Western Sydney.
Correspondence concerning this article should be addressed to Dr Kevin Watson, School of Education, University of Western Sydney, Locked Bag 1797, South Penrith Distribution Centre, NSW 1797, Australia. Electronic mail may be sent to (k.watson@uws.edu.au).

HEP has been supplanted by what has been called a New Environmental Paradigm (NEP), and subsequently the New Ecological Paradigm (Dunlap, Van Liere, Mertig, Catton & Howell, 1992; Dunlap, Van Liere, Mertig & Jones, 2000). This theoretical framework sees people as players in a much wider natural world governed by the laws of nature and subject to its rule, where there are limits to human population and economic growth and technology as an instrument of people that is able to create as well as solve problems. Dunlap et al (1992) contend that the extent to which the New Environmental Paradigm reflects the attitudes of a community can be measured using a questionnaire, known as the NEP (Dunlap & Van Liere, 1978). The questionnaire consists of twelve questions. Eight questions reflect an NEP perspective and four questions reflect a HEP perspective on environmentalism. After reversing the scoring of the HEP questions and adding the item scores, a New Environmental Paradigm score can be established.

There have been attempts to develop a conceptual framework to illuminate the emergence of the NEP within general populations (Dunlap & Van Liere, 1978; Hooper & Nielsen, 1991). Schwartz (1977) developed a model that attempted to explain the causes of environmental attitudes, in an effort to offer an integrative theoretical Model of Environmental Concern (Stern et al. 1993). Stern et al. (1993) argued that the welfare of humans, including future generations, was only one dimension underlying pro-environmental attitudes and behaviours. As well as this *altruistic* value orientation towards humans, the Stern et al. model included *egoistic* and *biospheric* value orientations. The *egoistic* value orientation assumes that the motivation for pro-environmental action is predominantly economic and sociobiological and that the ultimate motivation for pro-environmental action is the benefit to be gained by the individual. In contrast, the *biospheric* orientation reflects the motivation of the 'deep ecologists' whose primary motivation for pro-environmental action is the welfare of ecological systems (Eckersley, 1992).

Within the broad framework of environmentalism, other researchers have begun to build theoretical frameworks based on specific areas, such as human value systems (Schultz, 2001), the inclusion of other in self (Aron, Aron & Smollan, 1992), ethics (Nash, 1990), ecosystem health (Rapport, 1995) and sustainability (Schoenfeld & Berkowitz, 1996). As yet, however, empirical studies of these frameworks and their inter-connectedness are limited.

Despite these efforts, the NEP remains the most commonly and widely used instrument for assessing environmental attitudes. There is growing agreement (see, for example, Shetzer, Stackman & Moore, 1991; Clarke, 1996) that the NEP instrument comprises three scales. The first scale is *humanity over nature* (*egoistic* following the Stern et al. model) and purports to measure the least pro-environment attitude. The second scale is *balance of nature* (*socioaltruistic* following the Stern et al. model) and is pro-environment but balances this view with the needs of or benefits to humans. The third scale is *limits of growth* (*biospheric* following the Stern et al. model) which is the most pro-environmental in terms of an ecological approach to environmentalism. Conceptually, the instrument allows for an overlap in views between an *egoistic* and an *altruistic* view and between an *altruistic* and a *biospheric* view of environmentalism, but does not conceive of any overlap between an *egoistic* and a *biospheric* view. It is the *biospheric* dimension of the NEP, that most clearly distinguishes it from the HEP. The environmental views of a 'deep ecologist' would be in sharp contrast to those of an 'economic rationalist'.

The conceptual framework underpinning the NEP is shown in Figure 1, and provided the basis for the current study.

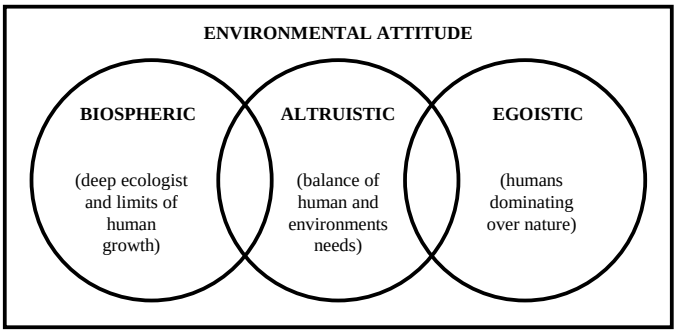

Figure 1. The dimensions of environmental attitude

A number of studies have used the NEP to investigate environmental attitudes in different countries. Furman (1998) measured support for the NEP in Istanbul, Turkey, and found it to be comparable with that reported for Pennsylvania. Support for the NEP was found to be much greater in Sweden than in Latvia and Estonia (Gooch, 1995). However, the level of concern for local environmental issues was much higher in Latvia and Estonia, possibly because people from these communities were more directly affected by such problems. Studies with Latino Americans have shown that their attitudes become less pro-environmental with acculturation into their host environment (Schultz, Unipan & Gamba, 2000). A survey of Nigerian secondary school students found

they had poor knowledge of environmental issues and a negative attitude toward environmental issues (Mansaray & Ajiboye, 1997).

Although the terms culture and country in no way equate, this collection of studies hint at a potential relationship between culture and environmental attitudes (Schultz, et al., 2000, p22) although the combination of cultural determinants that make up an environmental attitude may be unique to each cultural group or community. White (1967), for example, argued that the Judeo-Christian worldview was the cause of a western exploitative and damaging approach to nature. Kempton, Boster and Hartley (1995) explained differences in views about nature and environmental issues such as climate change using 'cultural models' and showed that some environmental actions were influenced by cultural values. Similarly, Wisner (1995) provided an insight into understanding African environmentalism in terms of place, livelihood and lifeworld, rather than in terms of western understandings.

It is unclear, however, whether the NEP questionnaire is the best instrument for accurately measuring environmental attitudes across cultures and communities. For instance, a study conducted in a Mexican city indicated that individuals held both pro-NEP and pro-HEP attitudes at the same time (Corral-Verdugo & Armendarez, 2000), even though the conceptual framework underpinning the instrument would hold that these two paradigms are mutually exclusive (see Figure 1 above; Bechtel, Corral & Pinheiro, 1997). One possible explanation for this phenomenon is the conceptual framework underpinning the NEP reflects a developed, western cultural perspective, and may not be adequate for assessing environmental attitudes in non-western or developing countries. Thus, probing environmental attitudes in non-western communities may require revision of the instrument and its conceptual underpinnings, or alternate data collection methods including scrutiny of why views are held in any given community. The purpose of the current study was to explore these issues by investigating the environmental attitudes held by pre-service teachers in three communities, one in each of Australia, Republic of Maldives and Indonesia, and to compare the similarities and differences between countries.

Research Framework

Sample

A community of trainee teachers in each of three different countries (Australia, Western Sydney, NSW, Republic of Maldives, Malé, and Indonesia, Surabaya, Central Java) formed the sample for this study. These communities were purposively selected because of their predominantly different ethnic and religious backgrounds, both of which are key

Table 1. *Gender, Nationality, Age and Religion Profile of Each Community*

Community	Gender	Nationality	Mean Age (SD)	Religion (%)		
				Christian	Islam	Hindu
Australia (N = 211)	Male 12.9% Female 87.1%	Australian 81.8% Other 18.2%*	22.2 (6.77)	97.3	2.2	0.4
Indonesia (N = 225)	Male 13.7% Female 86.3%	Indonesian 100%	20.9 (1.46)	2.8	92.4	4.7
Maldives (N = 199)	Male 20.2% Female 79.8%	Maldivian 100%	20.6 (1.88)	6.0	94.0	0

*Respondents listed a total of 28 different countries in response to the question about nationality

elements in the constitution of a cultural identity, and to increase the probability of cultural differences between the countries in the study. The Republic of Maldives is an Islamic country and relatively homogeneous in terms of culture and ethnicity. Indonesia has a range of cultural and ethnic groupings although the town of Surabaya is predominately inhabited by Javanese. The dominant religion is Islam but other religions such as Christianity are also present. Australia has diverse cultural and ethnic groupings particularly in Western Sydney where there are a diverse range of religions practiced. It was recognised that the study's cross cultural context could have been enhanced if one of the Islamic communities was replaced by a non Islamic, non western community; however, this was not able to be achieved in the time frame available for the study.

Student teachers were identified as an appropriate population because the literature had identified a range of attitudes towards and knowledge about environmental issues amongst senior school students (Clarke, 1996) and student teachers (Leeming, Dwyer, Porter & Cobern, 1993), and because teachers, as a group, are potentially influential in shaping the environmental attitudes of future generations.

The NEP (Dunlap & Van Liere, 1978) questionnaire (see Table 2) was administered to a total sample of 635 pre-service teachers, comprising 211 from Australia, 225 from Indonesia and 199 from the Republic of Maldives. Table 1 documents the sociodemographic data for each of the three groups of participants.

A sub-sample of ten volunteer students from each community was interviewed to probe the detail of their environmental attitudes using an in-depth interview and phenomenographic analysis. The number of interview participants was less than desired, but considered adequate based on the detail of the data to be collected and the samples sizes cited in the literature on phenomenological methods (Marton & Saljo, 1984; Marton, 1994; Biggs, 1994).

Methodology

The NEP (Dunlap & Van Liere, 1978) was used in the current study. Although the questionnaire was updated by Dunlap, et al. (2000), this version had not been widely used when the study was conducted and its predecessor was used to maximize the potential for comparisons with other research. For administration of the questionnaire in Surabaya, the questionnaire was translated into Javanese and then back-translated into English by experienced translators to check the accuracy of the translation. For administration in the Republic of the Maldives, an English version was used because English is the language of instruction in schools and teacher education programs, and widely used in everyday social interaction.

The NEP questionnaire sought to identify the environmental attitudes present in each sample group using a five point bi-polar Likert scale (1 = strongly disagree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly agree). The questionnaire data were analysed statistically to calculate means and standard deviations for each of the three scales (*biospheric*, *altruistic* and *egoistic*). Cronbach alpha values were calculated to ascertain the internal consistency of each scale, and a total NEP score for each respondent was calculated to indicate respondents' pro-environmental perspective. The NEP score was achieved by reversing the

Table 2. *Scales in the NEP Questionnaire*

Scale	Statements Comprising Each Scale
Biospheric	• We are approaching the limits of people the Earth can support. • The Earth is like a spaceship with only limited room and resources. • There are limits to growth beyond which our industrialised society cannot expand. • Humans are severely abusing the environment.
Altruistic	• The balance of nature is very delicate and easily upset. • When humans interfere with nature it often produces disastrous consequences. • To maintain a healthy economy industrial growth should be controlled. • Humans must live in harmony with nature in order to survive.
Egoistic	• Humans have the right to modify the environment to suit their needs. • Humans were created to rule over the rest of nature. • Plants and animals exist primarily to be used by humans. • Humans need not adapt to the natural environment because they can remake it to suit their needs.

scores for the *egoistic* scale (because the questions were phrased from an anti pro-environmental perspective) and adding these to the *biospheric* and *altruistic* scores. The total NEP scores ranged from a minimum of 12 to a maximum of 60. These data were converted to a mean and standard deviation for each community on a 1 to 5 scale to facilitate comparison with means and standard deviations of the *biospheric*, *altruistic* and *egoistic* scales. To determine similarities and differences in environmental attitudes, an analysis across the three countries was carried out using SPSS one way ANOVA and MANOVA. Significant differences were identified at the .05 level using Bonferroni Post Hoc tests.

For all three communities, at least 80% of respondents were female. This gender bias in teacher education is common across the globe. Analysis showed that there were no significant differences in the views held by male and female respondents in all three communities, across all dimensions analysed.

The questions for the interview schedule were developed to provide a more nuanced understanding of the reasons for participants' questionnaire responses, and informed by an existing program of research in cultural identity (see for example Halse, 2001; Halse. & Baumgart, 2000; Baumgart & Halse, 1999). The interview schedule was piloted with 6 Australian pre-service teachers and an initial phenomenographic analysis conducted, as outlined below. Three minor changes were subsequently made to the wording of two questions to enhance the clarity of the responses from participants. The final schedule for the semi-structured interviews is presented in Figure 2.

The interviews were analysed phenomenographically to ascertain the environmental views of participants. This method of analysis is grounded in the data and allows an individual's attitudes and views to emerge from what they say (Marton, 1994), rather than from predetermined categories. The different experiences, perceptions, understandings, views and attitudes identified are stated as 'categories of description', that are logically related to each other and from hierarchies against a given criteria. Such an ordered, hierarchical set of categories of description is called the 'outcome space' of the phenomenon (Biggs, 1994; Marton, 1994). The 'categories of description' and the 'outcome space' are the results of a phenomenographic analysis (Marton & Saljo, 1984; Biggs, 1994; Marton, 1994). In phenomenography, views and attitudes are not considered in isolation from the reasons for them and phenomenographic analysis not only reveals existing views and attitudes but also indicates what it *means* to have these views and attitudes. A phenomenographic analysis allows for the emergence of different or alternative attitudes towards environments. The emerging views can then be compared with those identified in the literature and questionnaire data, as was the case in the current study. This comparison is based on the differences between the views identified, rather than examining their essence to classify them within groups already identified.

Q1	Briefly tell me about yourself your background and your culture.
Q2	The word environment is different for different people. Tell me what the word environment means to you.
Q3	Where did you get your information about environments from?
Q4	At present there are environmental issues that some people think are a threat to the Earth. Tell me what you know about environmental issues, for example the greenhouse effect, acid rain and the ozone layer.
Q5	Sometimes human interests and the needs of environments come into conflict. When these situations arise which do you think should have priority?
Q6	As technology advances and communication improves some people say the world is changing. Do [insert name of country] think the world is changing? Why do [insert name] have this view?
Q7	What action do you and other people in [insert name of country] take to reduce the impact of humans on environments?
Q8	People view different aspects of the world differently. Some aspects of a person's world are very important and influence their view. What are some aspects of your and [insert name of country] views of the world that influence people?

Figure 2. Semi-structured interview schedule

Analysis

Survey Questionnaire

The *biospheric* scale views attitudes towards environments from a deep ecological perspective where pro-environmental

Table 3. *Biospheric, Altruistic and Egoistic Perspective Showing Means and Standard Deviations for Each Community*

NEP Dimension	Community	Mean (1 to 5)	Standard Deviation	Cronbach alpha
Biospheric	Australia	3.64	0.59	0.66
	Indonesia	3.53	0.76	0.82
	Maldives	3.44	0.64	0.75
Altruistic	Australia	4.38	0.51	0.65
	Indonesia	4.30	0.56	0.77
	Maldives	3.97	0.70	0.77
Egoistic	Australia	2.03	0.73	0.85
	Indonesia	2.70	0.63	0.65
	Maldives	3.10	0.87	0.74

action is motivated by concern for the welfare of ecological systems. The *altruistic* scale views attitudes towards environments as a balance between the needs of humans and the needs of environments. The *egoistic* scale views attitudes towards environments as being dominated by human needs. The means and standard deviations for the *biospheric altruistic* and *egoistic* perspective for each community are shown in Table 3.

For the *biospheric* perspective oneway ANOVA indicated a significant difference [$F(2,632)=4.75$ ($p < .01$)] in at least one pair among the three communities. Bonferroni Post Hoc tests showed Australia to be significantly different ($p < .05$) from the Maldives. For the *altruistic* perspective oneway ANOVA indicated significant differences [$F(2,632) =27.27$ ($p < .01$)] between means. Bonferroni Post Hoc tests showed Australia and Indonesia to be significantly different ($p < .05$) from the Maldives. For the *egoistic* perspective oneway ANOVA indicated significant differences [$F(2,632) =111.56$ ($p < .01$)] between means. Bonferroni Post Hoc tests showed Australia, Indonesia and the Maldives all to be significantly different ($p < .05$) from each other.

These results indicate that the Australian respondents viewed environments from a deep ecological perspective compared with Maldivian respondents. The Australian and Indonesian respondents also tended to consider environments as a balance between the needs of humans and the needs of environments while the Maldivian sample could be considered less altruistic. The Australian respondents tended to agree that environments should not be dominated by human need. The Maldivian respondents, however, appear to place more importance on human need when their views were compared with Australian respondents, while the views of the Indonesian respondents lay in between and significantly different from the views of both the Australians and Maldivians.

Overall, the Australian and Indonesian communities tended to at least 'agree' with the New Environmental Paradigm. However, although the Maldivian community tended to 'agree' with the *biospheric* and *altruistic* perspectives, the community may not have a perspective consistent with the New Environmental Paradigm because the mean for the *egoistic* perspective centred on 'neutral'.

The total NEP score aligns all three scales in the same direction, reflecting a pro-environmental (NEP) perspective. The means and standard deviations for the total NEP score

Table 4. *Total NEP Scores Showing Means and Standard Deviations for Each Community*

Community	Score (12 to 60)	Mean (1 to 5)	Standard Deviations Score (Mean)
Australia	47.96	3.99	5.47 (0.47)
Indonesia	44.54	3.71	4.83 (0.40)
Maldives	41.26	3.44	4.81 (0.40)

(12 to 60) across all three communities are stated in Table 4. For ease of comparison with the previous scales, these scores were divided by 12 to convert them to a mean on a scale of 1 to 5.

Oneway ANOVA indicated significant differences [$F(2,632)=92.85$ ($p < .01$)] between means. Bonferroni Post Hoc tests showed Australia, Indonesia and the Maldives all to be significantly different ($p < .05$) from each other.

Although each community's total NEP score was significantly different from each of the others' they were all above the 'neutral' score of 36 or mean of 3 indicating that all three communities have environmental attitudes which tend to be in agreement with the New Environmental Paradigm even though the degree of agreement varied.

The problem of response set bias across different cultures has been recognised by a number of researchers (Hui & Triandis, 1989; Watkins & Cheung, 1995; Watkins, 1996; Halse & Baumgart, 2000) and raises questions of interpretation when analysing similarities and differences between different cultural groups. Bias due to response set is an issue if there is a tendency for individuals from one group to respond in a systematically different way to questions, regardless of their content. Although this may seem a possible influence on the data collected from the NEP questionnaire, the fact that each community varied their response for the questions that constitute the *egoistic* scale suggest that it is unlikely that this type of response set bias is a major influence.

Semi-structured Interviews

Analysis of the interview data suggested that, the Australian participants generally thought that environments were important and that people should minimise their impact on them. However, analysis of the interviews with the Australian participants using a phenomenographic approach (Marton, 1994) generated five different categories of description for environmental attitudes. The outcome space, as shown in Table 5, was achieved by ordering environmental attitudes in terms of the reasons for modifying human impact on environments.

The views expressed in categories one and two indicate environments are being viewed from an individual, self-centred perspective but for different reasons and for different ends. The difference between the views is that one does not believe human impact on environments should be minimised while the other does – it simply chooses not to:

> I think the environment is very important but at the same time I have very little hesitation in hurting it, upsetting the natural environment. … I know I cause air pollution, but my need for a car is great.

The view expressed in category three shows that environments are being viewed in terms of their importance for other humans, especially future generations:

> I care about people's future. … to work together to sustain the environment and create a better future … to show how important the environment and the world is to future generations.

The final two categories indicate that environments are being viewed in terms of human needs and more broadly in terms of the needs of other species and environments. The example below illustrated the view of the participant in category five:

> I love nature. If we keep putting people first eventually the Earth will probably just die. The

Table 5. *Outcome Space for Australian Environmental Attitudes*

	Australian Environmental Attitude	Number of Respondents (N=10)
1 •	human impact should be judged on merit and not automatically minimised	1
2 •	human impact should be minimised but personal needs should be given priority	1
3 •	human impact should be minimised for the sake of other humans	5
4 •	human impact should be minimised for the sake of humans and other species	2
5 •	human impact should be minimised for the sake of environments themselves	1

Table 6. *Outcome Space for Indonesian Environmental Attitudes*

	Indonesian Environmental Attitude	Number of Respondents (N=10)
1.	• human and environmental interests should be balanced but not necessarily equally because environmental damage is an accepted consequence of human activity	2
2.	• human and environmental interests should be balanced for the sake of present human populations	3
3.	• human and environmental interests should be balanced for the sake of future human populations	3
4.	• human and environmental interests should be balanced for the sake of environments but humans should not be disadvantaged	2

environment is more important than people. We need to look at everything living together.

The findings from the interview analyses were consistent with the questionnaire results for the Australian sample, which generally agreed with the New Environmental Paradigm. However, the range of views expressed by interview participants was more extensive than in the literature or reflected in the NEP questionnaire.

The Indonesian sample generated four different categories for environmental attitudes as shown in Table 6. These were achieved by ordering environmental attitudes in terms of the reasons for minimising environmental impact.

Unlike the Australian participants, the Indonesian sample did not comment on the importance of environments. Nor does the range of environmental attitudes reported by Indonesian interview participants represent the full range of attitudes found in the literature. No *biospheric* or *egoistic* perspective emerged from the interview data. Instead, the Indonesian participants held a variety of 'balanced' views somewhat similar to the *altruistic* attitude described in the literature. However, the views expressed were different because of the reasons stated by the participants and therefore represented different attitudes towards environments, without being from a *biospheric* or *egoistic* perspective.

According to the interview data, the Indonesian sample interviewed exhibited anthropocentric environmental attitudes, which means that the attitudes of the sample towards environments were generated from a perspective intended to advantage humans. However, the extent of anthropocentricity varied, with participants in category one expressing the strongest degree of anthropocentricity. Responses falling into this category argued that reducing human environmental impacts was necessary so humans would benefit, as the following interview extract illustrates:

> Human interests are part of the environment, but if according to what we calculate it is better to cut the forest or animals, maybe it is better to cut. … Factories throw waste in the river. The factory needs to do this but it actually destroys the river. If the waste has to be thrown into the river then people need to be reminded to be careful.

Participants in category four demonstrated the least anthropocentric perspective. They argued that it was necessary to minimise human impacts on environments so that environments could be preserved and maintained, providing people were not disadvantaged:

> The environment needs to be preserved and maintained. … The environment should not be sacrificed, so long as people are not disadvantaged.

The findings from the interview data show a narrower range in environmental attitudes than those found in the literature, and reflected the view that human need and interests were always to be served. Such responses are not consistent with a New Environmental Paradigm perspective on environmentalism and suggest that the interview participants were more tentative in agreeing with the New Environmental Paradigm than the questionnaire results might suggest. This discrepancy might be a consequence of the number of interview participants. It might also be a function

Table 7. *Outcome Space for Maldivian Environmental Attitudes*

	Maldivian Environmental Attitude	Number of Respondents (N=10)
1.	• otherwise there will be no resources left for people to use	6
2.	• to preserve the environment for future generations	3
3.	• for the sake of other living things	1

of the questionnaire's inability to reflect the full diversity of perspectives in the sample.

All Maldivian interview participants expressed the view that environments were important and that environmental resources should be used while minimising human impact. Three different categories for environmental attitudes emerged, with the outcome space achieved by ordering attitudes in terms of the reasons for minimising human impact as shown in Table 7.

Like the Indonesian sample, the Maldivian sample displayed a narrower range in environmental attitudes compared with those found in the literature and compared with the findings of the questionnaire analysis. The range in views of the Maldivians interviewed centred on the idea of balance, and balancing the relative benefit to humans from the use of resources against the impact that humans have on resources. At one end of the spectrum, some participants believed that there would be no resources left for human use, as the following interview extract illustrates:

> Take things like plants, if we exploit them it will be bad for us. … We need the environment to support us. … So, we are there to maintain the balance.

At the other end of the spectrum, participants expressed a concern for other living things, as the following quote demonstrates:

> The environment is getting polluted because of industries and we can not stop that. If you want to develop the country, that's the way. But, we are not the only things living in the environment. … There are many living things to consider. The environment is for us and for other living things.

The interview data indicated that there were no *biospheric* or *egoistic* perspectives amongst Maldivian participants, and even when views appeared to be *egoistic*, they differed from the accounts in the literature because they were embedded in a framework of 'balancing' human and environmental perspectives. Moreover, most Maldivian participants arrived at their view from a 'human domination' or anthropocentric perspective rather than from the position of a human within a broad ecological framework. Irrespective of other considerations, minimising human impact on environments was for human benefit and therefore essentially anthropocentric. This is not consistent with a New Environmental Paradigm perspective on environmentalism and is in contrast to the total NEP scores calculated for the Maldivian community from the questionnaire data. Thus, the queries arising from the data analysis for the Maldivian sample echoed those arising from the analysis of the data provided by the Indonesian participants.

Findings and Discussion

All three communities exhibited pro-environmental attitudes as measured by the Dunlap and Van Liere (1978) New Environmental Paradigm questionnaire. The Australian sample was more pro-environmental than the Maldivian sample, and the perspectives of the Indonesian sample lay between these two groups. This pattern was consistent in terms of the scores for each of the three scales of the NEP and as measured by total NEP. The Australian sample showed significantly more support for a 'deep ecological' perspective than the Maldivian and Indonesian samples, but significantly less support for an *egoistic* perspective than the Maldivian sample. The pattern of results for the NEP *egoistic* scale indicates that the Maldivian respondents were 'neutral' about human needs dominating the environment compared with both the Australian and Indonesian pre-service teachers.

The pattern of results for the Australian sample interviewed was consistent with data from the NEP questionnaire, showing a range of responses across all three scales culminating as pro-NEP. However, the analysis of the Indonesian and Maldivian interviews suggests that these

communities are anthropocentric in their environmental attitudes and indicates that they may hold environmental attitudes developed from a different conceptual framework to that underpinning the NEP. The Indonesian and Maldivian interview findings did not indicate the presence of a true *biospheric* or *egoistic* perspective.

It is possible that the pattern of results is a product of the sample size and small number of participants, and the trustworthiness of the findings would have to be tested with a larger sample. However, if the findings are valid and there is no *biospheric* perspective present and if a *biospheric* perspective is necessary for pro-NEP attitudes towards environments, then the Indonesian and Maldivian communities may be exhibiting features of both paradigms simultaneously. Alternately, such communities may be responding from within a different theoretical framework, thereby indicating a conceptual weakness in the NEP when applied to non-western communities.

Similar contradictions have been identified by researchers such as Gooch (1995), Stern, Dietz and Guagnano (1995), and Corral-Verdugo and Armendarez (2000) and the application of the NEP questionnaire with non-western communities. Gooch (1995), for example, found that communities characterised by local rather than global perspectives were less likely to reflect a pro-NEP perspective on environmentalism, while Mansaray and Ajiboye (1997) found that Nigerians with little environmental knowledge did not reflect a pro-NEP perspective. Corral-Verdugo and Armendarez (2000) found that some Mexican communities held inconsistent views on environmentalism, and suggested that this was because individuals within such communities held competing views.

If individuals within a community hold competing environmental views then individuals responding to the NEP questionnaire from within a pro-HEP perspective would score high on the *egoistic* scale and low on the *biospheric* scale. Conversely, individuals responding from within a pro-NEP perspective would score high on the *biospheric* scale and low on the *egoistic* scale. This would move the means for the whole community for these scales towards a middle value, in this case towards three, with each scale characterised by a high standard deviation. Therefore, a high standard deviation for the *biospheric* and *egoistic* scales might indicate that some individuals respond from within one environmental paradigm while others respond from within another. The standard deviations for each scale and community are shown in Table 8.

As shown in Table 8, the standard deviations for the *biospheric* and *egoistic* scales for the Australian and Indonesian respondents are greater than the standard deviations for the *altruistic* scales and therefore, consistent with the explanation that individuals in a community may hold competing environmental views. In the case of the Maldivian respondents, only the standard deviation for the *egoistic* scale is greater than that for the *altruistic* scale. The standard deviation for the Maldivian *biospheric* scale, although high, is not higher than that for the *altruistic* scale. Nevertheless, with five of the six standard deviations being higher than those for the *altruistic* scale, especially the very high standard deviation for the Maldivian *egoistic* scale, there is strong evidence to support this explanation. The high standard deviation for the Maldivian *egoistic* scale indicates that the Maldivian community responded with a great degree of variation compared with both the other communities and the other scales. Consequently, the findings of this study support the findings from other studies (for example, Gooch, 1995; Stern, Dietz & Guagnano, 1995; Corral-Verdugo & Armendarez, 2000) that individuals within communities may hold competing views – that is, some individuals may hold pro-NEP views while others hold pro-HEP views.

Dunlap and Van Lierie, (1978) recognised that communities may hold both pro-NEP and pro-HEP views and

Table 8. *All Three NEP Scales Showing Standard Deviations for Each Community*

Scale	Standard Deviation		
	Australia (N=211)	Indonesia (N=225)	Maldives (N=199)
Biospheric	0.59	0.76	0.64
Altruistic	0.51	0.56	0.70
Egoistic	0.73	0.63	0.87

this was an underlying assumption in the development of the NEP questionnaire. The interview findings for this study, however, suggest that this pattern may also be the case for individuals and that some individuals may hold both pro-NEP and pro-HEP perspectives simultaneously. This is consistent with and further evidence for the findings of Corral-Verdugo and Armendarez (2000) and is in contrast to a western perspective on the NEP where the worldview for individuals would be either pro-NEP or pro-HEP (Bechtel et al., 1997).

The findings of the current study suggest that the NEP questionnaire, developed by Dunlap and Van Lierie, (1978) is able to accommodate the simultaneous presence of a pro-NEP perspective and a pro-HEP perspective at a community level, and is unable to distinguish responses from individuals who hold both views simultaneously because such a synergy of environmental attitudes is not consistent with the underlying assumptions of the instrument. Whilst this phenomenon might be a consequence of the reductionism of quantitative data collection and analysis, it suggest that when multiple environmental perspectives are held simultaneously, the Dunlap and Van Lierie questionnaire interprets this from a western perspective, as pro-NEP when in reality it is not.

Conclusions and Implications

This research indicates that there may be problems with aggregating data when using the NEP questionnaire to determine environmental attitudes in non-western cultures. When interviewed, Maldivian and Indonesian student teachers revealed a much narrower range of environmental attitudes than the NEP questionnaire predicted. These attitudes were anthropocentric and consistent with a pro-HEP perspective even though the NEP questionnaire indicated the sample was pro-NEP. The questions included in the NEP questionnaire survey were written from a western perspective to be interpreted from a western perspective. Consequently, assumptions are being made about the educational and cultural background of the reader. It suggests that the NEP is culturally specific and that the perspective that underpin it has a cultural bias and carries an unintended cultural context that is not transferable to cultures that do not share similar ethnicity, religious beliefs, values and attitudes. The findings highlight the need to go beyond western culturally based instruments and predetermined groupings when working with communities from non-western cultural backgrounds. Moreover, the findings suggest that the relationship between the *biospheric*, *altruistic* and *egoistic* dimensions of environmental attitude shown in Figure 1 need to be modified to more accurately account for communities and individuals simultaneously holding both pro-NEP and pro-HEP views. This reconceptualisation of environmental attitudes includes an overlap between the biospheric and egoistic dimensions for some people and is shown in Figure 3.

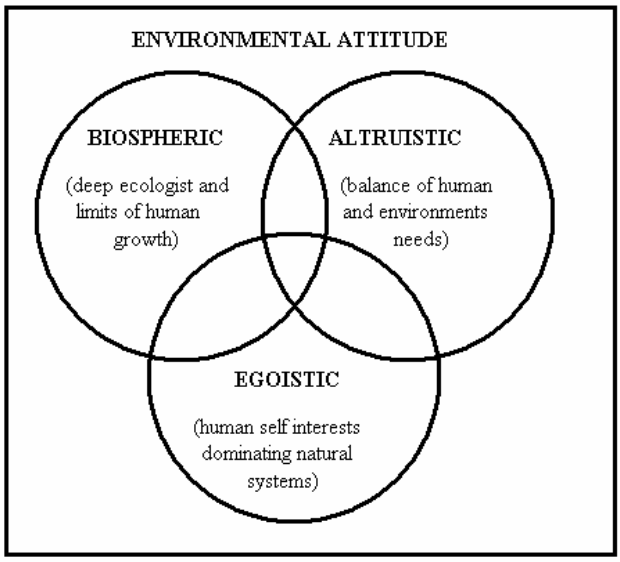

Figure 3. The reconceptualised dimensions of environmental attitude.

The findings of the study have implications for the use of reductionist analytical techniques in cross-cultural contexts, and suggest that qualitative data collection and analysis may be necessary to attain the nuanced understanding of community variation needed to develop strategic, effective intercultural understanding and to inform environmental reform, management and education. Without genuine understanding and tolerance of difference, agreement to cooperate across cultures at a global level is difficult to implement. This study suggests that attempts to align environmental initiatives across non-local boundaries may falter because people from different communities use different frameworks of the environment and these give rise to different attitudes towards the environment. Even though differences within and across cultures and communities may be unexpected, the conceptual framework underpinning global environmentalism needs to incorporate the potential difference as a necessary condition for cross-cultural understanding and acceptance for this is at the heart of effective environmental education and action.

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