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The 'New Environmental Paradigm': is the scale of Dunlap and Van Liere applicable in a tourism context?

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Abstract

More than twenty years ago, Dunlap and Van Liere (1978) developed the 'New Environmental Paradigm' scale (NEP) from the existent 'Dominant Social Paradigm' (DSP). Changes in values and beliefs concerning environmental issues made it necessary to further develop the DSP and include ideas, such as 'limits to growth', a 'steady-state economy', and 'a balance of nature'. The NEP has been adapted for a variety of further research, but only recently within a tourism context. This paper aims to compare a number of studies using the NEP and identify possible developments and changes in peoples' values. It finally addresses the question of whether or not the NEP is applicable in a tourism context.

***Keywords*:** New Environmental Paradigm, environmental values, environmental attitudes

Introduction

Western cultures share a long tradition of an anthropocentric world-view. Humans were viewed as superior and being 'above' nature. Part of this view was the abundance of natural resources and no need for conservation during that era. '*Homo sapiens* was seen, by virtue of possessing culture and technology, as able to adapt nature to human ends, rather than as having to adapt *to* the natural environment' (Dunlap 1980: 6). Social sciences saw humans as exempt from ecological constraints. These factors had been manifested in a set of beliefs and values, called the Dominant Social Paradigm (DSP). According to Albrecht, *et al.* (1982: 39) the DSP entails:

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1 a belief in limitless resources, continuous progress, and the necessity of growth;
2 faith in the problem-solving abilities of science and technology;
3 strong emotional commitment to a *laissez-faire* economy and to sanctity of private property rights.

With a sudden awareness of environmental problems, due to environmental accidents, oil spills, mismanagement of toxic waste (Noe & Snow 1990), increasing nuclear weapons and energy, it was recognized that humans are not immune to ecological constraints. In fact, they are part of a finite global ecosystem and cannot live without the stability of the system (Dunlap 1980). It was argued that behind the problem of the increasing ecological crisis was the set of basic beliefs and values – the DSP (Swan 1971). Changes in those values and beliefs emerged and new ideas included the necessity of a 'steady state economy', 'limits to growth', or 'balance of nature' (Dunlap & Van Liere 1978). This new world-view differed fundamentally from the view of the DSP and was termed the **New Environmental Paradigm** (NEP). Researchers conducted studies on environmental attitudes and behaviour. Those studies were very specific on concerns about pollution, preservation, erosion etc. However, there was a lack of knowledge about people's more generic disposition (Albrecht, *et al.* 1982). Dunlap and Van Liere (1978) designed a scale to measure the extent to which people would accept the ideas of the New Environmental Paradigm.

After Dunlap and Van Liere's initial study, a number of researchers applied the NEP and tested it for reliability, validity and particularly for the dimensions of the scale. The aim of this paper is to review some significant studies over the past twenty years and compare those with the recent study of the author. Finally, some results will be presented and compared with the goal to identify the applicability of the NEP scale in a tourism context.

The studies

For this paper, the following studies have been reviewed and will be compared. Dunlap and Van Liere's original study (1978) using 12 items, as shown in Table 1. Dunlap and Van Liere used two separate samples, one General Public Sample (GPS) and one sample, including members of environmental organizations (EOS). In 1982, Albrecht, *et al.* applied the NEP during a study and tested reliability, validity and dimensionality of the NEP. They also used two different samples, one of farmers and one of urban residents, both in the State of Iowa. Geller and Lasley (1985) used the samples of Albrecht, *et al.* (1982) and an additional study on farmers undertaken in Missouri. They were particularly interested in the question of dimensionality of the NEP. In 1990, Noe and Snow applied the NEP for studies at five national parks in the Southwest of the USA and looked at

reliability and dimensionality of the scale. Uysal, *et al.* (1994) appear to be the first researchers to apply the NEP in a tourism context. On the Caribbean island of St John, they applied the NEP to two samples and tested the NEP for reliability and dimensionality. In 1997, Pelstring reviewed Dunlap and Van Liere's first study and investigated the question of validity. Ryan (1999) conducted research on Australian tourists and their interest in wildlife-based tourism attractions. Seven original NEP items were used among the 18 items of the applied scale. Ryan applied cluster analysis to identify different types of tourists and their environmental values. In 2000, the author conducted a study of participants in dolphin tours in New Zealand (Lück 2000) and compared his results with the previously mentioned studies. Finally, Higham, *et al.* applied the 12 NEP items in a study at various ecotour operations throughout New Zealand in 2001.

Reliability

'Reliability refers to the extent to which a test or other measure performs consistently' (Kimble 1978: 186). In other words, a test or measure should produce the same results when undertaken repeatedly under exactly the same circumstances. The test used in these studies was Cronbach's coefficient alpha, which measures the internal consistency reliability among a group of items combined to form a single scale (Litwin 1995).

The coefficient can range from 0 (for a completely unreliable test with totally random scores) to 1 (for a completely reliable test) (Turner & Martin 1984). With one exception in the study of Uysal, *et al.* (1994), all compared studies indicate reliability coefficients sufficiently large enough to justify the use of the NEP (although some being marginal), as shown in Table 1.

Table 1 Dunlap and Van Liere's (1978) 12 NEP items

1.	We are approaching the limit of the number of people the earth can support
2.	The balance of nature is very delicate and easily upset
3.	Humans have the right to modify the natural environment to suit their needs
4.	Mankind was created to rule over the rest of nature
5.	When humans interfere with nature it often produces disastrous consequences
6.	Plants and animals exist primarily to be used by humans
7.	To maintain a healthy economy we will have to develop a 'steady-state' economy where industrial growth is controlled
8.	Humans must live in harmony with nature in order to survive
9.	The earth is like a spaceship with only limited room and resources
10.	Humans need not adapt to the natural environment because they can remake it to suit their needs
11.	There are limits to growth beyond which our industrialized society cannot expand
12.	Mankind is severely abusing the environment

Table 2 Comparison: reliability

	Sample	*Reliability (Cronbach's alpha)*
Dunlap and Van Liere (1978)	GPS	0.813
	EOS	0.758
Albrecht, *et al.* (1982)	Farmers	0.66
	Urban	0.78
Noe and Snow (1990)	Parks	0.61–0.71*
Uysal, *et al.* (1994)	Tourists	0.454; 0.699; 0.706**
Lück (2000)	Tourists	0.7756

*Cronbach's alpha was calculated for three park studies and each factor, indicated here are the lowest and the highest alpha.
**Cronbach's alpha was calculated for each factor.

Validity

When measuring validity 'we are essentially talking about construct validity – the approximate truth of the conclusion that our operationalization accurately reflects the construct' (Pelstring 1997: 1–2). There are several ways to validate a measure. Dunlap and Van Liere attempted to prove validity of their NEP scale by construct, predictive and face validity. Construct validity means that the scale has to be developed on a theoretical basis and needs to support those views by actual collected data (Pelstring 1997). It is referred to as the most difficult form of validity and often needs a longer period of time to be determined (Litwin 1995). Dunlap and Van Liere developed the NEP scale on a theoretical basis and consulted environmental scientists and ecologists in order to chose the relevant items and find an appropriate wording (Dunlap & Van Liere 1978). They then applied the NEP scale in a survey of two different samples and were able to prove that the NEP scale works in the way it was theoretically developed. Predictive validity validates the relation between a theoretically predicted outcome and the actual outcome of a study applying the scale. Dunlap and Van Liere predicted that members of environmental organizations are more likely to endorse the New Environmental Paradigm than members of the general public. The results clearly show that this is the case. The overall mean of the EOS was 3.7, while the overall mean of the GPS was significantly lower at 3.0 (Albrecht, *et al.* 1982). The third form of validity applied by Dunlap and Van Liere is the face validity. This is the most subjective (and therefore weakest) method to measure validity. 'A scale has "face validity" if its constituent items logically reflect the attitudinal domain being measured' (Albrecht, *et al.* 1982: 40). The developed 12 items constitute the paradigm and, by consulting scientists and submitting the scale for review by experts in environmental issues, the two researchers were able to gain face validity (Pelstring 1997).

Albrecht, *et al.* (1982) tested the NEP for validity as well. They applied the tool of predictive validity and argued that previous studies had shown that farmers are generally less environmentally aware than the general public. The results of the study amongst farmers and urban residents in Iowa surprisingly showed that the environmental awareness and acceptance of the New Environmental Paradigm was very high in both samples. However, the anticipated difference was confirmed with an overall mean of 3.2 for the urban sample and 2.9 for the sample of farmers (see Table 4).

Pelstring (1997) approached the validity issue of the NEP in a theoretical way. She reviewed the types of validity and compared those theoretical definitions with the three types of validity used by Dunlap and Van Liere. She concludes that Dunlap and Van Liere succeeded in proving the NEP scale as a valid scale (Pelstring 1997).

On the grounds of the three studies mentioned above, it appears that the New Environmental Paradigm scale is a valid instrument.

Dimensionality

If a scale is to be established for general use, it must be consistent across various populations. Inconsistent scales with different factor structures across various populations are of limited use for generalization (Geller & Lasley 1985). Therefore, it seems that dimensionality is the most important part of testing the NEP scale. All studies mentioned tested the NEP for dimensionality by using factor analysis.

Table 3 clearly shows that the outcome of these tests is diverse. Results of factor analyses varied from one to five factors. Dunlap and Van Liere applied factor analysis and found that all 12 items loaded sufficiently for one factor. The loadings ranged from 0.431 to 0.672 (0.526 average) for the GPS, while the loadings for the EOS ranged from 0.378 to 0.575 with an average of 0.466 (Dunlap & Van Liere 1978). Some loadings were rather low, but were still seen as sufficient to assign the items to one single factor. Therefore, Dunlap and Van Liere suggest that 'it is appropriate to treat all 12 items as forming an internally consistent and uni-dimensional NEP scale' (Dunlap & Van Liere 1978: 14).

While Albrecht, *et al.* (1982) agreed with Dunlap and Van Liere in terms of reliability and validity, their findings regarding dimensionality were different. They also submitted the 12 items of the NEP scale to factor analysis. This time, three factors emerged for both the farmers and urban sample. These loadings were consistent and underlined the multi-dimensionality of the scale. Further analysis of the three factors revealed that each factor consisted of four items and could be classified as 'balance of nature', 'limits to growth', and 'man over nature' (Albrecht, *et al.* 1982).

Geller and Lasley (1985) were particularly interested in the matter of dimensionality of the NEP scale. They adopted the data of Albrecht, *et al.*

Table 3 Comparision: dimensionality

	Sample	*Dimensionality (factors)*
Dunlap and Van Liere (1978)	GPS (Wash.)	1
	EOS (Wash.)	1
Albrecht, *et al.* (1982)	Farmers (Iowa)	3
	Urban (Iowa)	3
Geller and Lasley (1985)	Farmers (Iowa)	4
	Urban (Iowa)	5
	Farmers (Missouri)	4
Noe and Snow (1990)	National Park users and residents close to NPs (Southwest USA)	2
Uysal, *et al.* (1994)	Tourists (St John)	3
Lück (2000)	Tourists (New Zealand)	2
Higham, *et al.* (2001)	Ecotourists (New Zealand	3

(1982) and added a third sample. This third sample comprised farmers in Missouri. After applying factor analysis, Geller and Lasley's findings confirmed the results of Albrecht, *et al.* In fact, Geller and Lasley found that a minimum number of four factors are needed for the farmer samples of Iowa and Missouri and five factors for the urban sample. Therefore, Geller and Lasley also cannot support the hypothesis of uni-dimensionality of Dunlap and Van Liere. However, they 'cautiously accept the Albrecht, *et al.* interpretation of three factors as being "Balance of Nature", "Limits to Growth", and "Man over Nature"' (Geller & Lasley 1985: 12). They suggest the use of a reduced nine-item, three-factor scale.

Noe and Snow (1990) used five samples of national park visitors and residents living in close proximity to national parks in the Southwest of the USA. Factor analysis of those samples showed similarities with Geller and Lasley's (1985) study, however, there were some differences. Most striking was the finding that the pool of 12 items yielded only two significant factors (Noe & Snow 1990). The missing factor comprises more abstract items, such as 'steady state economy' or 'spaceship earth'. Noe and Snow conclude in confirming the multi-dimensionality of the NEP scale, however, they recommend to continue the use of all 12 items and not to expect a single dimensional scale. They argue that there is insufficient evidence for abandoning three of the 12 items, as suggested by Geller and Lasley (Noe & Snow 1990).

Uysal, *et al.* (1994) applied the nine-item NEP scale suggested by Geller and Lasley (1985). They used two samples of visitors to national parks on the small Caribbean island of St John. Their study confirmed the three

factors 'Humans over Nature', 'Balance of Nature', and 'Limits to Growth', with significant loadings between 0.5179 and 0.8548 (Uysal, *et al.* 1994).

In a study of participants in swim-with-dolphins tours at three different locations in New Zealand (two in South Island, one in North Island), the author also used the original 12 items of the NEP scale. Factor analysis applied to this New Zealand sample revealed two factors: One factor 'Humans over Nature' with four items and one 'general' factor comprising the remaining eight items of the scale. All items showed loadings between 0.495 and 0.831 and could be clearly assigned to either of the two factors. This result is similar to Noe and Snow's outcome of two factors and also confirms the multi-dimensionality of the NEP scale.

The most recent study of Higham, *et al.* (2001) applied the original 12 NEP items, however, on a five-point Likert scale. The similarities between their study and that of Uysal, *et al.* (1994) is noteworthy. Indeed Higham, *et al.*'s (2001) study revealed exactly the same three factors as Uysal, *et al.*'s study in 1994. The items showed loadings between 0.511 and 0.829, which allowed clear assignment to the respective factors, with the factor 'balance over nature' explaining 35.9 percent of the variance.

Results

Only three of the studies discussed in this paper presented the actual results of the surveys. Testing the scales for reliability, validity and dimensionality was prevalent. This is a clear indication for the importance of the suitability of the NEP scale as a valid measurement tool. Ryan (1999) also presented results; however, he used only seven out of the original 12 items and applied a five-point Likert scale instead of the original four-point Likert scale. Therefore, results are not directly comparable. The available results of the studies are introduced in this section.

Interpretation of these results is difficult and certainly bears the danger of error. One of the obvious reasons for that is the variety of samples. However, some trends might be elicited. If we disregard the EOS and the farmers samples due to their special members with biased opinions, it can be seen that there is a constant increasing acceptance of the New Environmental Paradigm. While the mean score in 1978 was 3.0, it increased to 3.2 in 1985 and further to 3.4 in the year 2000 (Table 4). In particular, the score of 3.4 has to be read carefully, because participants in dolphin tours might be closer to the EOS sample than to the general public – especially as the respondents were asked to fill in the questionnaire right after the thrilling experience of a dolphin tour. The only sample not following this trend was Higham, *et al.*'s (2001) study of ecotourists in New Zealand. Although the surveys were conducted exclusively at twelve ecotour operations/attractions throughout New Zealand, the respondents showed a lower mean overall (2.8). One would have thought that ecotourists, in particular, would

Table 4 Comparison: mean scores

	Sample	*Mean Score**
Dunlap and Van Liere (1978)	GPS (Wash.)	3.0
	EOS (Wash.)	3.7
Albrecht, *et al.* (1982)	Farmers (Iowa)	2.9
	Urban (Iowa)	3.2
Lück (2000)	Tourists (New Zealand)	3.4
Higham, *et al.* (2001)	Ecotourists (New Zealand)	2.8**

*Means were calculated by summing the average scores for each of the 12 items and dividing by 12. Possible range is from 1 to 4, with higher scores representing greater acceptance of the NEP.
**Converted from a five-point Likert scale.

endorse the ideas of the NEP to a larger extent than tourists of the other samples.

The first two studies were conducted in the United States, and the respondents of the New Zealand study were a mixture of a number of nationalities. Traditionally, German, Dutch and Scandinavian residents have higher environmental values and have adopted pro-environmental behaviour, for example recycling, into their daily routines. Therefore, one could assume that they are more likely to approve the NEP than other nationalities. However, when applying an analysis of variance (ANOVA) in order to compare the means of different nationalities, the results were surprising. There were only very slight differences, with the lowest mean of 2.93 for the Asian respondents and the highest mean of 3.22 for the Germans (Figure 1). The American mean was at 3.14, which is a score that lies between those of the previous studies.

The NEP uses a four-point Likert scale, with four being the most positive value and one the most negative value. The results of all three studies are remarkable with all mean scores (one exception) being three or higher. This indicates that there is a high approval of the NEP and people's environmental awareness has increased over the last 20 years. Ryan (1999) used 18 items in order to identify environmental awareness. Cluster analysis was applied with the result of the indentification of five different clusters: The 'Aprés Moi', the 'Optimists', the 'Very Concerned', the 'Less Pessimistic', and the 'Nebulous'. Ryan could not find a relationship between cluster members and the rates of visitation to wildlife attractions. However, he states that those who do visit wildlife attractions are mostly 'sensitive to and appreciate messages relating to environmental issues' (Ryan 1999: 8).

It would be interesting to see further research into the environmental behaviour of the respondents. It is argued that there is a considerable gap between environmental education and aspirations on the one hand, and changes in behaviour on the other (Cameron, *et al.* 1998; Diekmann &

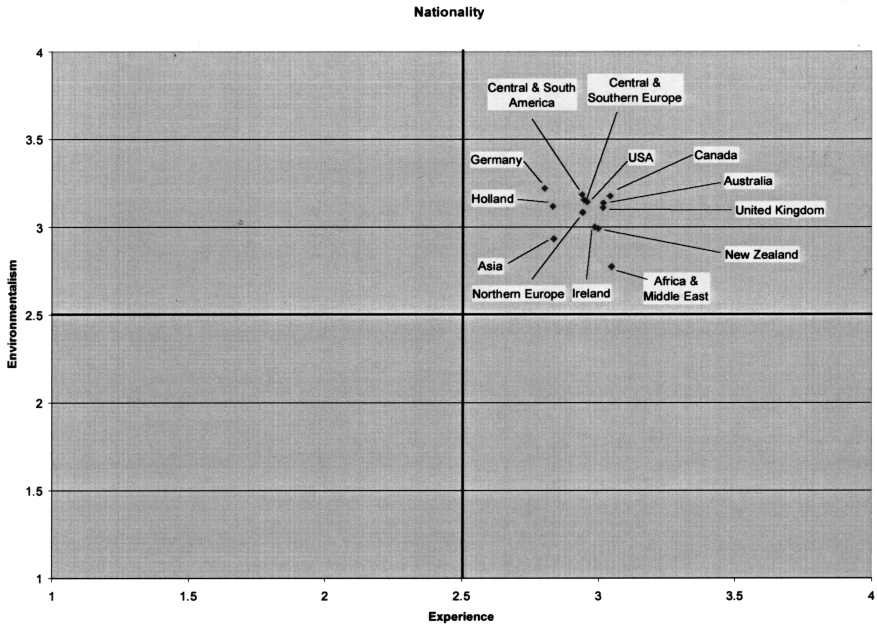

Figure 1 Environmentalism and experience of different nationalities. Note that the frequencies of the clusters 'Africa and Middle East' and 'Central & South America' (6 and 4, respectively) are not sufficient for reliable data.

Preisendörfer 1998). Hence, one may conclude that even though the majority of the population is endorsing the NEP, their actions in reality might be far away from their good intentions.

The NEP has been widely tested, however, only to a small extent in a tourism context. For a study at swim-with-dolphins operations in New Zealand, in addition to the NEP scale, 11 relevant items of the Environmental Concern Scale (EC) (Weigel & Weigel 1978) and 15 items of the General Measure of Ecological Behaviour (GEB) (Kaiser 1998) were applied. While the NEP looks at general, global environmental issues, the EC addresses issues related to pollution and personal willingness to make sacrifices in order to protect nature. The GEB deals with actual behaviour of the respondents, from recycling to the use of public transport. The survey also included a variety of questions regarding the experience and satisfaction on the tours. It was attempted to achieve an overall score for the three environmental scales (termed 'environmentalism') and relate it to the experience on the tours. It was anticipated that respondents who hold high environmental values would have a lower experience during the tours. This was explained with the assumption that more environmentally aware travellers would have second thoughts about such tours and were aware of the possible negative impacts the tours might have on the dolphins.

Figure 1 shows that this could not be confirmed. Respondents of all origins do not only have similar environmental values (as previously discussed), but also similar high experiences. When comparing 'environmentalism' with 'experience' with a variety of demographic data, such as age, gender, employment status and education level, the picture is the same. There are no significant differences between certain demographic groups.

Conclusion

With an increasing concern for the environment, the world has experienced a shift from the anthropocentric Dominant Social Paradigm (DSP) to the ecocentric New Environmental Paradigm (NEP). Dunlap and Van Liere (1978) developed a 12-item scale to measure the extent to which respondents are endorsing this new world-view. They argued that their NEP scale is reliable, valid and uni-dimensional. Several studies over the last 20 years attempted to test this NEP scale and unisono agree to the following points: The NEP scale proved to be a reliable scale. Various researchers tested the NEP scale for different forms of validity and found that the scale is a valid tool to measure environmental values. However, all researchers found that the NEP scale is *not* uni-dimensional, as suggested by Dunlap and Van Liere in 1978. Six subsequent studies revealed dimensions from two to five factors for the NEP scale, but almost all researchers suggest that there is not enough evidence for a definite number of dimensions and further research in that area is recommended.

Four studies applied the NEP in a tourism context. Uysal, *et al.* (1994) tried to find a relationship between environmental awareness and demographic data, as well as trip behaviour. They conclude that 'demographics seem to play a minor role in identifying environmentally sensitive travellers. Of greater significance is trip behaviour' (Uysal, *et al.* 1994: 283). Ryan (1999) used the scale in order to confirm the hypothesis that wildlife attractions in Australia would appeal to specific market segments. However, he could not find a significant relationship between environmental awareness and attitudes towards wildlife attractions. Finally, the NEP scale was used in order to find a relationship between environmental awareness and the experience on swim-with-dolphins tours in New Zealand. Here, as in Uysal, *et al.'s* (1994) study, demographics did not seem to have an influence on the environmental values and attitudes. Both the scores for environmental attitudes and for the on-tour experience were very high and there was no significant difference between any demographic subgroups. It seems as if tourists have higher environmental attitudes than the general population and, overall, they endorse the NEP to a large extent. This may have various reasons, for example, the actual experience just before filling in the survey (such as wildlife attractions in Australia or swimming-with-dolphins in New Zealand). There might also be a higher concern for the environment

during holidays in general, because tourists are surrounded by beautiful scenery and wildlife, which raises appreciation and concern. All three studies have been conducted in relatively nature-based areas (national parks, wildlife attractions, dolphin tours). It can be argued that visitors to those attractions might have a higher environmental awareness in the first place, and therefore endorse the NEP. The only exception is Higham, *et al*.'s (2001) study. Although here, as well, tourists displayed high environmental values, they are significantly lower than those of participants in dolphin tours. Higham, *et al*. (2001: 30) note that the 'prevalence of ecocentric attitudes towards the environment (support expressed for the 'balance of nature') held by visitors to ecotourism operations in New Zealand is a finding that should be recognized by operators seeking to achieve high levels of visitor satisfaction'. It is, therefore, concluded – in line with previous research – that the NEP has to be tested further at different sorts of tourism attractions. When applied at nature-based attractions, the scale seems to be of very limited use.

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Résumé: Le nouveau paradigme de l'environnement: peut-on utiliser l'échelle de Dunlap et Van Liere dans le domaine du tourisme?

Dunlap et Van Liere (1978) ont développé une échelle 'nouveau paradigme de l'environnement' (NEP) voilà plus de vingt ans à partir du 'paradigme social dominant' (DSP) qui existait alors. Des changements dans les valeurs et les croyances au sujet des problèmes qui concernent l'environnement ont forcé un développement ultérieur du DSP qui incorpore maintenant des idées telles qu'une 'croissance limitée', un 'développement économique pondéré' et un 'équilibre avec la nature'. Le NEP a été adapté pour de nombreuses études mais seulement récemment dans le contexte du tourisme. Cet article cherche à comparer des études qui ont utilisé le NEP pour identifier la possibilité que les valeurs des gens aient évolué ou changé. Il questionne également l'applicabilité du NEP dans le domaine du tourisme.

***Mots-clés*:** Nouveau Paradigme de l'Environnement, valeurs concernant l'environnement, attitudes vis à vis de l'environnement

Zusammenfassung: Das New Environmental Paradigm: Ist das Schema von Dunlap und van Liere auf den touristischen Kontext anwendbar?

Vor mehr als zwanzig Jahren (1978) entwickelten Dunlap und van Liere das Schema des 'New Environmental Paradigm' (NEP) aus dem älteren ‚Dominant Social Paradigm' (DSP). Wandlungen in den Werten und Vorstellungen hinsichtlich Umweltfragen machten es notwendig das DSP fortzuentwickeln und dabei Ideen wie 'limits of growth' ('Grenzen des Wachstums'), ‚steady-state economy' ('wohlstandserhaltende statt wohlstandsmehrende Volkswirtschaft') und ‚balance of nature' ('Umweltverträglichkeit') einzubeziehen. Das NEP wurde für eine Reihe von Forschungen verwandt, aber erst kürzlich auch in einem touristischen Kontext. Dieser Beitrag beabsichtigt den Vergleich einiger Studien, welche das NEP anwenden, und versucht die Feststellung möglicher Entwicklungen und Wandlungen in gesellschaftlichen Werten. Schließlich behandelt der Beitrag auch die Frage, in wiefern das NEP in einem touristischen Kontext anwendbar ist.

Stichwörter: New Environmental Paradigm, Umweltwerte, Umweltansichten