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ENVIRONMENTAL RISK TO THE SELF: FACTOR ANALYSIS AND DEVELOPMENT OF SUBSCALES FOR THE ENVIRONMENTAL APPRAISAL INVENTORY (EAI) WITH AN IRISH SAMPLE

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Abstract

This paper expands the work on perception of risk to the Self from hazards in the environment by developing psychological aspects of ecological risk perception, which have received little attention to date. Responses from 159 university students to a 26-item scale of environmental hazard perception, an adaptation of Schmidt and Gifford's (1989) Environmental Appraisal Inventory (EAI), were factor analysed and a 20-item scale with three subscales was developed. The subscales represented techno-human, natural, and everyday-life hazards, and these are the first subscales to be developed on the EAI. Psychometric properties of the scales are discussed and cultural differences in hazard identification are addressed.

Introduction

This paper is concerned with the perception of risk to the Self from hazards in the environment, one aspect of the broader construct of ecological risk perception. It is clear that public concern about ecological risks has grown in parallel with a heightened awareness of environmental degradation and sustainability issues (Slovic *et al.*, 1996). For instance, the majority of international survey respondents have expressed the view that environmental protection is of persistent concern to them (Matas, 1995, in Canada; Dunlap, 1991; Dunlap & Scarce, 1991, in Europe; see Dunlap *et al.*, 1993, and The Roper Organization, 1993, for global comparisons). However, within academic circles, while there is recent recognition of the increasing need for serious research on ecological risk management, much of the work to date has been undertaken by physical and biological scientists (Royal Society Study Group, 1983). In contrast, the psychological processes whereby ecological risks are characterized and assessed have received little attention (Slovic *et al.*, 1996). For example, using special issues in journals as a crude indicator of topical research, the topic of 'psychological aspects of technological risk and hazard' was for the first time addressed by the *Journal of Environmental Psychology* in 1985, 4 years after its first issue (Canter *et al.*, 1985). Further, in the Irish psychological literature, interest did not become apparent until 1996, when, 25 years after its first publication, the *Irish Journal of Psychology* printed a special issue entitled 'Psychology and the Environment' comprised entirely of theoretical papers. An important step in redressing this imbalance between popular sentiment and sparcity of psychological research is to investigate perceptions of risk to the self empirically using a psychometric approach similar to that employed in the human health risk perception field (e.g. Slovic *et al.*, 1980; Slovic, 1992). Within such a paradigm, the development of standardized measures is a necessary first step, and a reliable and valid measure for appraisal of environmental hazards is a vital tool in this work.

First published in 1989, by Schmidt and Gifford, the Environmental Appraisal Inventory (EAI) comprised a list of 24 hazards in the physical environment. These hazards were chosen to represent a range of hazards defined by *source, extent of impact,* and *duration of impact*. The items were rated, on a seven-point Likert-type scale, across three dimensions; threat to the *self*, threat to the *environment* and *control appraisal* (a fourth dimension, *responsibility,* was included with an expanded scale by Fridgen, 1994). The present study focuses on one of these scales, the Selfscale, which measures appraisal of threat to the individual from environmental hazards. The psychometric properties of this scale have been addressed in two published studies (Schmidt & Gifford, 1989; Fridgen, 1994), and in both instances, reported internal reliability was impressive (Cronbach's alpha of 0·93 and 0·95, respectively). In each of these studies, the authors have recommended the development of subscales, and this has not yet been done.

While this task provides ample motivation for the present work, additional benefit may accrue from examining the extent to which cultural differences may occur in the way that hazard perception is construed. Not only do socio-economic factors differ between residents in Canada or the U.S.A. (the locations of the previous studies employing the scale) and Ireland, but the differences in environmental landscapes and the degree of industrialization also vary significantly. Furthermore, the historical development and media representation of environmental hazard perception may have localized effects (Boholm, 1998), which combine to emphasize the importance of culturally relevant research methods (MacLachlan, 1997, 2000). This view consolidates the anthropological approach of the late 1970s and early 1980s (for example Torry, 1979; Sorensen & White, 1980; Douglas & Wildavsky, 1982; Thompson, 1983), which indicated the occurrence of cultural variation in the perception of hazards. In particular, the occurrence of 'distinct cultural differences in the selection of events identified as hazards' (Cvetkovich & Earle, 1985; p. 19).

Thus, the current work investigates the characteristics of the EAI-Self scale in a population culturally different from those previously examined, and factor analyses the responses to elicit the underlying constructs and subscales that may comprise environmental threats to the self within an Irish sample.

Method

Instruments

The original 24-item scale presented by Schmidt and Gifford (1989) formed the basis of the scale used in the current study. The changes made were: (a) item 3 on the original scale (pollution from cars, factories, and burning trash) was separated into three distinct items (items 3, 4, and 5), and (b) item 5, on the current scale, was culturally adapted by substituting the word 'rubbish' for the word 'trash' (see Table 1). The lead-in statement was positioned at the top of each page and read: 'Please rate how threatening the following problems are to you by drawing a circle around the response that best describes your position'. Available response options were no threat, minimal threat, mild threat, moderate threat, strong threat, very strong threat, and extreme threat.

Sample

Presented here are data on 26 hazards rated by three groups of university student volunteers (no incentives were offered), in two universities in the capital city, Dublin, between 1995–1996. To examine whether the three groups differed on the dependent variable, we conducted between-group comparisons. As no significant differences emerged between the groups, they were collapsed and treated as one sample. Subsequent analyses were therefore conducted on a sample of 159 protocols from participants aged 17–54 years. The response rate for the sample was 44 per cent.

Administration

The scale was presented as part of a larger questionnaire designed to measure the interaction of environmental awareness and well-being. The other measures examined ecological philosophy or worldview ('New Environmental Paradigm scale' or 'NEP scale'; Dunlap, *et al.*, 1992: we experienced confusion in the literature around the naming of this scale and will subsequently call this version the New Environmental Paradigm—revised, NEP—R) and general health ('General Health Questionnaire' GHQ-60; Goldberg, 1978). Questionnaires were distributed during lecture time and completed at the student's own convenience. Distribution and collection procedures were replicated for each data collection and are presented below. At the beginning of the lecture period the purpose of the study was explained by the researcher, who read aloud the statements in the cover page of the questionnaire:

> We are interested in how people think about the environmental aspects of the world they live in and how that may affect them. The aim of this study is to examine how environmental awareness and well being might interact. It is important that you understand that there are no 'right' or 'wrong' answers. We are interested in what your opinion is. We would like you to complete this questionnaire in your own time. We suggest you do this at a time when there is the least likelihood of you being disturbed. Read each question carefully and answer honestly,

working your way from the beginning to the end. Any information given will be treated with complete confidentiality. Thank you for taking time to partake in this study.

Questionnaires were then distributed and volunteers were asked to return the completed forms to the lecturer either a week later at the same lecture time, or to the lecturer's office, at any time over the next 3 weeks.

To address the issue of the effect of 'embedding' the EAI-Self scale in a larger questionnaire a subgroup of the sample ($n = 72$) were surveyed using a 'Balancing' technique (see Shaughnessy & Zechmeister, 1990), whereby randomized Latin Square ordering was employed.

Missing data

No trends were apparent in missing data. Missing data points were replaced with means for cases with less than 10 per cent of all points missing, in other cases the listwise exclusion method within the Factor Analysis procedure in SPSS was employed.

Results

Multivariate analysis of variance showed no significant effect for the order in which the scales were presented.

Descriptive analysis

Rank ordering of means with standard deviations is presented in Table 1. Comparison of either end of the continuum shows that 'change to the ozone caused by pollution' was the item given the highest mean rating, while the item 'earthquakes' was considered the least threatening by the sample.

TABLE 1
Ranked means, standard deviations, and sample size for the 26-item EAI-Self scale

Item no. and text	Rank	Mean	S.D.	Valid *N*
15. Change to the ozone caused by pollution	1	4·38	1·59	151
3. Pollution from cars	2	3·79	1·41	152
6. Smoking in public buildings	3	3·78	1·86	152
4. Pollution from factories	4	3·65	1·45	152
22. Radioactive fallout	5	3·49	2·14	150
24. Chemical dumps	6	3·46	1·84	151
21. Germs or micro-organisms	7	3·24	1·38	151
26. Pesticides and herbicides	8	3·23	1·55	151
1. Water pollution	9	3·15	1·57	152
7. Acid rain	10	3·11	1·47	151
18. Impure drinking water	11	3·09	1·63	151
5. Pollution from burning rubbish	12	3·03	1·37	152
14. Radioactivity in building materials (e.g. radon gas)	13	2·95	1·71	151
23. Fumes or fibers from synthetic materials (e.g. asbestos, carpets, plastics)	14	2·76	1·35	151
19. Large fires	15	2·66	1·54	151
9. Number of people (e.g. crowding, population explosion)	16	2·60	1·44	151
13. Visual pollution (e.g. billboards, ugly buildings, litter)	17	2·60	1·37	151
12. Noise	18	2·47	1·37	151
11. Water shortage (e.g. drought, water depletion)	19	2·37	1·53	151
25. Video screen emissions	20	2·30	1·23	151
8. Pollution from office equipment	21	2·17	1·26	151
2. Storms (e.g. lightning, hurricanes, tornados, snow)	22	2·13	1·05	152
20. Floods or tidal waves	23	2·05	1·51	151
17. Soil erosion	24	1·95	1·21	151
10. Fluorescent lighting	25	1·88	1·04	150
16. Earthquakes	26	1·82	1·45	151

Factor Analysis

To assess the suitability of the data for the Factor Analysis procedure, we adopted three parallel approaches. First, we looked for significant correlations in the matrix. SPSS offers the Bartlett test of Sphericity as a default statistic for this purpose, and in this case the value was large ($V = 2534{\cdot}86$; $p < 0{\cdot}0001$) and statistically significant. Given the sensitivity of this test to sample size we also looked at the structure of the correlation matrix. Thus, the second approach was to assess the magnitude of individual correlation coefficients. Approximately 80 per cent of the correlation coefficients had absolute values greater than 0·3 (the generally recommended level), and all items had correlations of at least 0·4 with at least one variable. The third approach was to examine the size and relative contribution of the unique factors (constructs other than those described by the common factors). Partial correlations, produced in the anti-image correlation matrix, occur when the effect of other variables has been removed from the paired correlation. When values are small, this suggests the presence of 'true' factors (Hair *et al.*, 1995). In this instance, there was such an indication with almost half (45%) of these correlation coefficients having absolute values of less than 0·1. Regarding the relative contribution of the unique factors, we employed another SPSS 'default' statistical measure, the KMO or measure of sampling adequacy MSA (Kaiser, 1970). In effect a measure of the degree of inter-correlations among variables, this procedure specifies the variance attributable to unique factors relative to that of the common factors. These values were well within the optimal parameters set out in the literature (e.g. Kaiser, 1974; Hair *et al.*, 1995), with individual values ranging from 0·80 to 0·94, and a 'meritorious' value (KMO = 0·89) for the entire matrix. From a synthesis of these three perspectives, we surmised that the data was well suited to the Factor Analysis procedure.

The Principal Components (PC) method was used for extracting factors. Six factors had an eigenvalue of >1, explaining 70 per cent of the total variance. From the Scree Plot (Cattell, 1966; see Figure 1), it appeared that either a two- or a three-factor solution would effect a parsimonious representation of the data. The first three factors explained 57 per cent of the total variance, with eigenvalues of 11·16, 2·19 and 1·47, respectively.

Given the profile in the scree-plot, and the considerable (0·72) gap between the values of the second and third eigenvalues, we specified a procedure to decide between these two solutions. We compared: (1) the respective amounts of variance explained, (2) the percentage of communalities below a value of 0·5, and (3) the results of a model-fit test (see Ager & MacLachlan, 1998), comparing the fit of the two-factor [chi-square (df. 274) = 683·3; $p < 0{\cdot}001$] and the three-factor [chi-square (df. 250) = 561·9; $p < 0{\cdot}001$] models. This procedure showed that: (1) extraction of a third factor explained 5·7 per cent more variance than the two-factor model; (2) the three-factor model had a reduced number of items with communalities less than 0·5 (19% compared to 48%). Communality is the squared multiple correlation coefficient between a variable and all other variables in a matrix. Low communality indicates poor overlap of item variance, and subsequently a large specific variance. Within the terms of construct validity, it is important to maximize the common variance of individual items in the scale; and (3) finally, the three-factor model was selected by the model-fit test [chi-square (df. 24) = 121·4; $p < 0{\cdot}001$]. Subsequently, the results of the three-factor model were considered most salient.

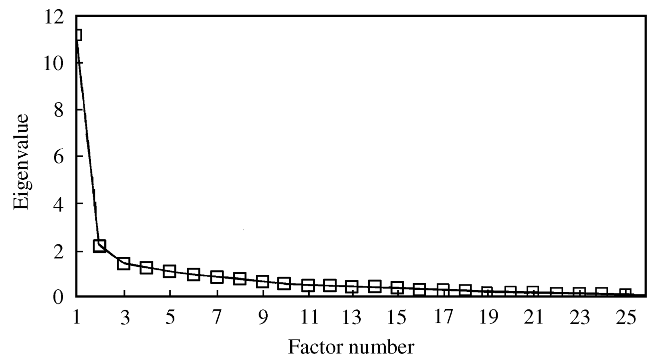

FIGURE 1. Scree plot for 26 item EAI-Self scale.

The complexity of the unrotated three-factor solution indicated the necessity for rotation. While the orthogonal solution (VARIMAX) increased the simplicity, the oblique rotation (Direct OBLIMIN, Delta −1), interpreted from the Pattern matrix, yielded the 'simplest' (Cooper, 1998) structure. The criteria for item selection were specified in terms of loading thresholds and variable complexity. The threshold for factor loadings was set at 0·5 with an optimum complexity of one (i.e. a large loading on one factor and near zero loadings on the other two factors), or a minimum difference of 0·2 between the principal and subsequent factor loading.

Eleven, four, and five items, in turn, loaded onto the three factors (see Table 2). Six items failed to meet the loading criteria. These were items 14, 21,

TABLE 2
Factor loadings for subscales of EAI-S20 scale

Item no.	Wording	Factor 1: techno-human hazards	Factor 2: natural hazards	Factor 3: everyday life hazards
24.	Chemical dumps	0.845		
4.	Pollution from factories	0.845		
26.	Pesticides and herbicides	0.750		
22.	Radioactive fallout	0.749		
1.	Water pollution	0.714		
15.	Change to the ozone caused by pollution	0.687		
5.	Pollution from burning rubbish	0.680		
3.	Pollution from cars	0.660		
18.	Impure drinking water	0.656		
7.	Acid rain	0.577		
23	Fumes or fibres from synthetic materials (e.g. asbestos, carpets, plastics)	0.556		
20.	Floods or tidal waves		−0·881	
16.	Earthquakes		−0·840	
19.	Large fires		−0·675	
2.	Storms (e.g. lightning, hurricanes, tornadoes)		−0·570	
10.	Fluorescent lighting			0.744
25.	Video screen emissions			0.675
8.	Pollution from office equipment			0.585
12.	Noise			0.580
13.	Visual pollution (e.g. billboards, ugly buildings, litter)			0.544

Loading criteria were 0·50 on the principal factor and a difference of at least 0·20 between subsequent loadings.

11, 17, 6, and 9 ('radioactivity in building materials', 'germs or micro-organisms', 'water shortage', 'soil erosion', 'smoking in public buildings' and 'number of people').

The shared variance of the three factors was 57 per cent with individual factor contributions of 42·9 per cent, 8·4 per cent and 5·7 per cent, respectively. The dimensions of the scale were thrown into relief by the oblique nature of the rotation procedure, which yielded three distinct yet related factors. Each factor was correlated to a moderate extent with the first factor ($r_{1,2} = -0{\cdot}37$, $r_{1,3} = 0{\cdot}43$) while the relationship between the second and third factors was considerably smaller ($r_{2,3} = -0{\cdot}20$).

Perusal of Tables 1 and 2 shows the ranked positions of the items loading onto the three factors. For instance, all of the items loading onto the first common factor ranked above 15. In contrast to the highly ranked items loading onto the first factor, those loading onto the second factor were ranked between 15 and 26. In similar relative positions, the items loading onto the third common factor ranked between 17 and 25. Given the nature of the items loading on to the factors, the names techno-human hazards, natural hazards and everyday life hazards were given to the subscales (see Table 2). The item-means for the three factors were 3·38, 2·28 and 2·16, respectively. One-way analysis of variance showed an overall difference between the factors (F=54·09; df. 2, 449; $p < 0{\cdot}0001$) and *post hoc* analysis (Bonferroni, p.05) confirmed the distinction between the first and the remaining two factors.

To further explore, and conceptually validate, the nature of these subscales and the difference between the first factor and the other two factors we employed a previously specified empirical framework (Slovic *et al.*, 1996). A panel of 10 independent judges classified the items across three dimensions: 'source', 'scale of impact', and 'news-worthiness'. Items were categorized as human generated vs natural phenomena, having global vs localized impact, and being a highly publicized hazard rather than something that is a contributory factor to a newsworthy hazard. A cut-off of 70 per cent agreement was adopted when determining item categorization. Within this structure, techno-human hazards were clearly human generated; however, there was a mix between the classifications of 'scale of impact' and 'news-worthiness'. Slightly more of the techno-human hazards were viewed as having a globalized rather than localized impact, and as being contributors toward publicized hazards, rather than highly publicized hazards in their own right. The second subscale, 'natural hazard', was unanimously defined as 'natural' and 'highly publicized'. One half of the items were judged to have global impact and the other half were seen to have localized effects. The third factor, 'everyday life hazards', was the most clearly defined of the three. These items were classified as human generated hazards that have localized impact and contribute to highly publicized environmental hazards.

To examine the relationship between the EAI-Self scale and the derived subscales with the other instrument in the study that addressed environmental attitudes (the NEP—R, a 15-item measure rated 1–5), we computed Pearson correlation coefficients. Significant positive relationships were found between the NEP—R score and the scores for the 26-item scale ($r=0{\cdot}37$; $p<0{\cdot}001$), the techno-human subscale ($r=0{\cdot}41$; $p<0{\cdot}001$), and the everyday life subscale ($r=0{\cdot}33$; $p<0{\cdot}001$). There was a substantially lesser relationship between the NEP—R score and the score for the natural hazards subscale ($r=$ $0{\cdot}15$; $p=$ $0{\cdot}06$).

Internal consistency of the 26-item scale, the derived 20-item scale, and the subsequent subscales was examined using Cronbach's alpha. These coefficients are presented, along with respective means, standard deviations, and sample size in Table 3.

In each case, the internal reliabilities were impressive, the lowest value being an acceptable 0·79.

Discussion

The analyses presented here are important in that they demonstrate that it is possible to simplify and order diverse information about hazard perception. In the first instance, by applying an empirical method, we ranked hazards in terms of salience. The item 'change to the ozone caused by pollution' was found to be more threatening to the self than any of the other 25 items presented. This is not so surprising given the high media profile afforded to this issue in recent times. Indeed, one could surmise that ozone depletion has become a personally salient issue as a consequence of constant public health warnings about skin cancer and the aggressive marketing of sun-block creams. That 'pollution from cars' was ranked second may be explained by the media attention given to 'traffic gridlock' and 'air pollution' in a city where car numbers are increasing at a significant rate.

Current figures from the Irish Government's Department of the Environment show that the number of private cars in Ireland has exceeded one million for the first time ever. Further, there has been a nationwide increase of 123·32 per cent in the numbers of private cars, registered for the first time, from 1972 to 1996 — a period within the personal memory of the study participants. More salient, perhaps, is the December 1996 statistic indicating that almost one third (28·46%) of these vehicles were registered in the capital city Dublin (the location of the study). The effect of this 'locally situated' traffic is increased considerably by the large number of cars that are driven into the city, from other nearby registration areas, on a daily basis. Indeed, road traffic is now seen as the most significant source of air pollution in Ireland (EPA, 1998).

While both of the above items were selected by the adopted factor analysis model, it is interesting to note that although the topical issue 'smoking in public buildings' was ranked third, it was not included in the factor-derived scale. Thus, while it is not surprising that this issue was ranked highly (smoking prohibition laws have changed in recent years alongside targeted anti-smoking Government health campaigns), it is interesting to note that 'smoking in public buildings' appears to be an issue separate from those represented in the three subscales. Why this should be is not clear and may warrant further research.

Of the three items at the lower end of the ranking (see Table 1), 'soil erosion' was an item also excluded by the factor analysis. That this was the case is understandable insofar as soil erosion is an issue little discussed in Ireland, and where it is (e.g. in terms of coastal erosion), it is confined to specialist interest groups. This would contrast with, for instance, the public memory of the giant dust-bowls in the centre of North America or soil erosion consequent to deforestation in many African and Asian countries.

Table 3
Means, standard deviations, and Cronbach's alpha for the EAI scales

Scale	Mean	S.D.	N	No. of items	Cronbach's Alpha
EAI-S26	74·03	25·02	148	26	0·94
EAI-S20	57·18	19·88	148	20	0·94
Techno-human hazards	37·19	13·41	149	11	0·93
Natural-hazards	8·65	4·70	151	4	0·85
Everyday life hazards	11·41	4·66	150	5	0·79

That such an item is clearly influenced by local geography is exemplified by the difference between the ranking of 18 in the Canadian sample (Schmidt & Gifford, 1989) and the ranking of 24 in the Irish sample. Similarly, 'earthquakes' were viewed as more threatening (ranked 17 and 26, respectively) by the Canadian than the Irish participants.

When we examined the rank order of mean responses for disembedded items 3, 4, and 5, it became clear that the impact of pollution from these sources was viewed differently. While pollution from 'cars' and 'factories' was ranked similarly (2 and 4 , respectively), and reflected the ranking of 3 in the British Columbian study (Schmidt & Gifford, 1989), pollution from 'burning rubbish' received a considerably lower rank of 12. This may be related to the low incidence of waste incineration in Ireland, where municipal solid waste is predominantly disposed of in landfill sites (Dennison, 1996). In 1995, 84·7 per cent of collected commercial waste and 94·7 per cent of collected municipal waste — more than 2 million tonns — was landfilled (Department of the Environment, 1998). This is in stark contrast with the position in other countries and, of greater pertinence, Canada, where the construction of incinerators for municipal waste in Ontario has now been prohibited (Gale, 1996). Given the low incidence of incineration in Ireland it is suggested that this item be adapted to 'pollution from disposal of rubbish' in future studies in this country. The different mean rating for 'cars', 'factories' and 'burning rubbish' clearly justifies our 'unpacking' of this item as applied in previous studies.

The Factor Analysis procedure, employed here, has provided a parsimonious identification of subscales within the EAI-Self scale. Given the ambiguity in interpretation of the scree plot, the application of the decision criteria specified above did result in a clear preference for the three-factor solution. However, it may well be that the structure of hazard perception may be unstable and would be likely, perhaps as a function of geography, to vary across samples. In this regard, additional studies, adhering to the procedures specified here, are required for cross-validation of the description of environmental threat perception to the self.

While the adoption of conservative loading criteria did result in the exclusion of some of the original items from the 26-item scale, it was useful insofar as we were clearly able to define the subscales. We have named these subscales techno-human hazards, natural hazards, and everyday life hazards. Techno-human hazards can be seen as hazards that accrue from human-generated activities related to technology or industry. Natural hazards are phenomena that are intrinsic to the natural world, and everyday life hazards are phenomena that occur within people's usual daily experience. When we looked at the relative impact of the subscales, we saw that there was a distinction between the subscales and in particular between the techno-hazards and the other two subscales. This was apparent both in terms of individual item ranking and in terms of subscale total scores. Further, we demonstrated relationships between the hazard perception scores and scores on the NEP — R. Thus, EAI-Self scores predict endorsement of an ecological worldview. The NEP — R has been reported as predictive of perceived seriousness of world ecological problems, support for pro-environment policies, perceived seriousness of air and water pollution, and self-reported pro-ecological behaviours (Dunlap *et al.*, 1992), and we would suspect that the EAI is predictive of at least some of these constructs. This is an issue that we are addressing in on-going work.

The results of the conceptual categorization were also informative. This paradigm offers an approach wherein the subscales can be described more richly. The results point to distinct separations between the notions of source of generation, scale of impact, and nature of public awareness, both across and within the subscales. This combined approach can facilitate a more meaningful forum for understanding the nature of human–environment interactions.

In conclusion, while it is wise to interpret the impressive reliability coefficients in this present analysis with caution (Cooper, 1998), the similarity to previous results is noteworthy. The original EAI has provided an important springboard for the present research. Environmental hazards are diverse in nature and the empirical framework for data reduction, presented here, can be usefully applied in teasing out the underlying meaning construed in environmental risk to the Self. We have shown, for the first time, the presence of three distinct subscales within the EAI-Self scale. For the present sample, 'techno-human' hazards represent significantly more risk than either 'natural' or 'everyday life' hazards, and predict endorsement of a pro-ecological worldview. In line with previous findings (Cvetkovich & Earle, 1985; EPA, 1998: Table 3 shows figures for environmental threat across seven states in the European Union), comparison of ranked mean for the Canadian and Irish samples do indicate differences in hazard perception between the two cultures. We suggest that these cultural effects may be a function of geography and policy, rather than cultural *per se*, in nature.

While it may well be that we live in the 'age of ecology' (Dunlap *et al.*, 1992) we also see evidence of unsustainable lifestyles; namely, increases in resource usage far beyond sustainable levels, both at local and global levels of impact. For example, in terms of local impact, Irish farmers increased their use of phosphorous chemical fertilizers more than three-fold (20,000–62,000 tonnes) in the years 1950–1994. This addressed a one-time nutrient deficiency but current residual levels are so high as to represent a problem for water quality. An estimated 2500 tonnes are lost from land to water annually and 18 per cent of a sample of Irish lakes were polluted to such an extent to impair their 'beneficial use'. Moving from locally induced pollution to a more global scale, 'radioactive fallout' ranked five in our sample, indicating awareness of threat that transboundary pollution poses. Ireland has no nuclear power stations but the East Coast is in close proximity to the nuclear reprocessing plant at Sellafield, in the U.K. Discharge of low level liquid wastes from that plant is the main source of man-made radioactive contamination in the Irish Sea (EPA, 1998), and parts of the country were affected by radioactive fall-out from the Chernobyl nuclear explosion some years ago.

In refining the EAI-Self scale, this paper has expanded on the work published a decade ago, and is informed by empirical work in the health-risk area. It contributes to an area that has traditionally eschewed the interest of psychologists, and, in the first instance, affords the beginnings of a description of environmental risk to the Self within a population where awareness is growing that the Emerald Isle may *not* be forever green. These issues, predominantly originating in the minority / industrialized world, have both local and global impact and require changes in behaviour at both local and global levels.

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Notes

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