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## Influences and Experiences Affecting the Pro-environmental Behaviour of Educators

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**SUMMARY** *This paper examines the relative importance of various categories of influence and formative life experiences on the development of environmental educators' knowledge and concern for the environment. The authors analyse the ways in which the importance of influences may change through time or be affected by the subject's age. Conclusions are drawn and discussed, including the crucial role of the family and of childhood experiences outdoors in promoting the development of concern for the environment and pro-environmental adult behaviour.*

### Background

This paper reports a more fine-grained analysis of data first described and discussed in the paper 'Development of concern for the environment and formative experiences of educators' (Palmer, 1993). The research builds upon and extends the work of Tanner (1980), who reported the findings of a research study that investigated the significant life experiences of active, informed conservationists in the USA. The purpose of his study was to highlight the kinds of life experiences that produce adults who are informed about and actively promote environmentally positive behaviour. Tanner wrote to professional staff and chapter officers of selected citizen groups (the National Wildlife Federation, the Nature Conservancy, the National Audubon Society and the Sierra Club) and invited recipients to provide an autobiographical statement identifying the formative influences that led them to choose conservation work. Youthful experiences of the outdoors and of pristine environments emerged as the most dominant influence. This data supported Tanner's hypothesis (1974a, b) that children must first come to know and love the natural world before they can become concerned with its care.

Tanner's work on formative experiences raises many interesting questions, such as whether such influences are the same in the UK as in the USA and whether they are changing with time, so that those most important among young people today are different from those for older generations. The need for answers to such questions was a motivation for the present study.

If a fundamental aim of environmental education is to help children learn about and care for the environment, then those responsible for this subject area must know the types of learning experiences that help to produce active and informed minds. This study, although based on the methodology of Tanner (1980), incorporated a much larger sample of educators and different forms of statistical analysis. The preliminary analysis (Palmer, 1993) showed many similarities between the UK data and Tanner's findings. In particular, the most common category of influence was outdoor experiences, especially those in childhood. The present, more detailed analysis, carried out by a different researcher, looks at the patterns of influences both across the whole sample and also by age group.

### Method

An outline of the study was mailed to the membership of the National Association for Environmental Education (NAEE) in the UK. They were asked to provide their approximate age, gender, details of their demonstration of practical concern for the environment and an autobiographical statement identifying those experiences that led to this concern. The participants were also asked to state what they considered to be their most significant life experiences and to write a statement indicating which, if any, of the years of their lives were particularly memorable in the development of positive attitudes toward the environment. As the form only gave the aims and purposes of the research the participants were able to provide completely original responses unbiased by any examples.

We aimed to confirm the sample as a group of active and informed citizens, i.e. those who know about and care for the environment in their adult life. A list of seven possible activities relating to pro-environmental behaviours was provided, and the subjects were asked to indicate those in which they regularly engaged.

Two hundred and thirty three forms were returned, 103 from male subjects and 130 from female subjects. The number of subjects in each age group was as follows: under 30, 54; 30–50, 126; over 50, 53. The responses to the questions concerning practical activities illustrates the high level of commitment of the sample to environmental concerns. Figure 1 shows the numbers involved.

As can be seen from Fig. 1, about 90% read about environmental issues (212) and tried to lead a 'green' lifestyle (210). Over 80% (197) were involved in recycling and a similar number (194) enjoyed outdoor activities. This project attempted to identify which experiences have led to such interest and involvement.

During the first reading of the autobiographical statements possible categories of response were constructed. A summary form was drawn up to support the second, analytical reading, after which the final categories were established. Thirty three single factors (see Table 1) were identified and the results entered

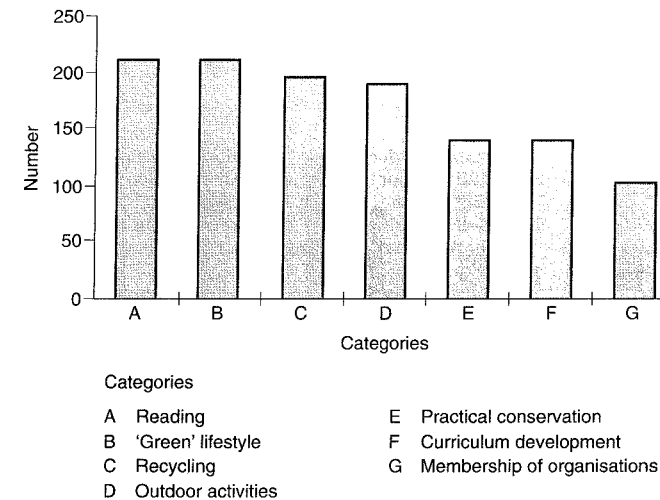


FIG. 1. Graph of involvement in activities ( $n = 233$ ).

into a database. All factors mentioned were recorded, regardless of the stated or implied importance. Later in the analysis these single factors were grouped where appropriate. Seven groups were formed containing between two and five single factors and the rest were left as single factors. Table 1 shows the 33 single factors and the grouping used. The average number of single factors mentioned by the sample as a whole was 4.50.

The highest number of factors mentioned by a single respondent was 13. Figure 2 shows the range of number of factors mentioned (1–13, the ends of the line) together with the median and quartiles (the middle and ends of the box). It can be seen that half the responses included between three and six factors (inclusive).

The main results of the analysis are now detailed. First we present the data on the most frequently mentioned grouped and single factors. Second, differences between the age groups are described. Third, a comparison is made between the results in general and responses in which subjects had ranked influences in order of importance. Finally, we provide comments on the correlation between factors and then on inter-judge reliability.

### Results

#### Factors of Response

Groups of factors are considered first. Figure 3 shows the frequency with which each group was mentioned.

Figure 3 shows the number of respondents who mentioned one or more factor in each group. It is evident that the first two groups (outdoor and education) are the most important, being mentioned in over 60% of the accounts. The influence of family, friends and colleagues (people) was included in 51% of the life stories.

TABLE 1. Single factors and groups of factors

Group	Single factors	Examples
Outdoor	Childhood outdoor	Experiences of nature and the countryside
	Teenage outdoor	Camping, hiking
	Adult outdoor	Climbing, walking
	Adult nature	Bird watching
Education	Adult agriculture, horticulture, gardening	Involvement in agriculture, horticulture, gardening
	Primary	
	Secondary academic	Courses in school, e.g. A level
	Secondary practical	Field trips/courses
	Tertiary courses	First degree and professional
People	Tertiary research	
	Family	Parents, grandparents, siblings
Work	Older friends	Teachers, lecturers
	Friends	Including spouses, colleagues
Organisations	Work	In mainstream education and voluntary organisations
	Youth	Scouts
	Nature	Naturalist Trusts, RSPB
Media	General	Greenpeace, CND
	TV nature programmes	
	TV documentaries	
Travel	'Positive' books	Natural history
	'Negative' books	Effects of human activity, including newspapers
Negative	Youth	
	Adult	
	Towns	Problems of urban living
	Pollution	Effects of chemical sprays
Having children	Health	Asthma
	Other negative reasons	
	Disasters	African famine
Pets		
Religion		
Others		

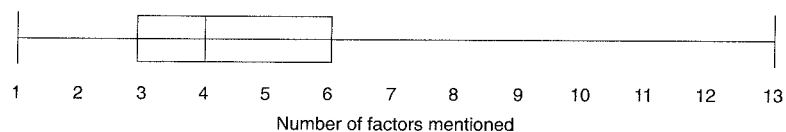


FIG. 2. Box plot of number of factors mentioned per person.

The effect of their work was important to 46% of the sample. The single factors recorded the lowest frequencies, e.g. having children 10%, pets 6% and religion 5%.

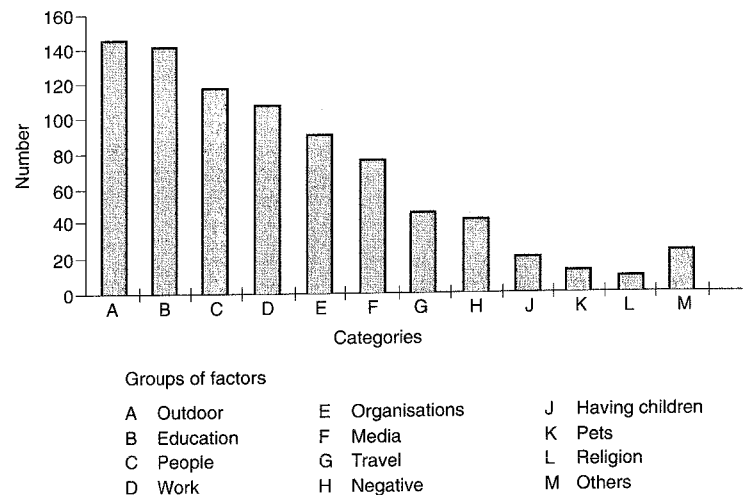


FIG. 3. Graph showing grouped factors (n = 233).

Whilst consideration of the groups of factors does show, generally, which types of influences were most frequently mentioned, it is useful to look at some of the more common single ones. Half of the single factors (16 out of 33) were mentioned by less than 10% of the respondents, in contrast, five of them (see Table 2) were included in more than 20% of the accounts. Table 2 shows the prime importance of childhood experiences of nature, being mentioned by 55% of the respondents. Higher education courses and the demands of work were also common influences.

Differences between Age Groups

The respondents were unevenly distributed across the three age groups and the gender representation varied, as shown in Table 3. The youngest group included some student members who were predominantly female (28 out of 30), while two thirds of the oldest group was male. This means that it is impossible to distinguish between differences due to gender and age. Thus we only refer to

TABLE 2. Table of the most frequently mentioned single factors (n = 233)

Factor	Number	Per cent
Childhood experiences of nature and the countryside	128	55
Tertiary education courses	109	47
Experiences and demands of work	108	46
Influence of family	84	36
Effect of 'negative' books (e.g. <i>Silent Spring</i> )	57	24
Secondary school courses (especially A level)	55	24

TABLE 3. Table of respondents according to age and gender ( $n = 233$ )

Age group	Under 30	30-50	Over 50
Male	9	58	36
Female	45	68	17
Total	54	126	53

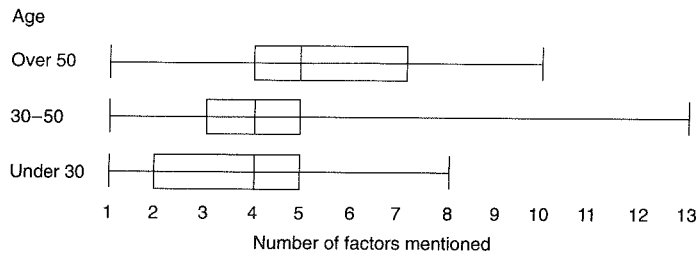


FIG. 4. Box plot of number of factors mentioned by age group.

TABLE 4. Single factors by age group ( $n = 233$ )

Factor	Age group					
	Under 30		30-50		Over 50	
	Number	Per cent	Number	Per cent	Number	Percent
Family	16	30	48	38	20	38
Older friends	10	19	22	17	7	13
Secondary education	16	30	29	23	10	19
Tertiary education	20	37	65	52	24	45
Child-nature	14	25	77	62	37	70
Work	4	7	65	52	39	74
'Negative' books	18	33	33	26	6	11
Organisations—nature	4	7	13	10	20	38
—general	9	17	12	10	2	4

differences between age groups and do not take account of possible effects of gender.

Figure 4 show the number of single factors mentioned by respondents according to age group.

The variation in the number of factors makes direct numerical comparisons between the age groups difficult, nevertheless, some interesting differences can be identified.

Looking first at individual factors, Table 4 shows the frequency of some of them by age group.

From Table 4 it is clear that similar percentages occur across all three age groups in several cases, e.g. the influence of family (30%, 38%, 38%). Although there is greater variation between the age groups in older friends, secondary and tertiary education, these do not appear to follow a particular trend. In contrast, there are five cases in which a clear pattern occurs.

The positive experiences of nature and the countryside in childhood (child-nature) are much more common in the older age groups (62% and 70%) than in the youngest (25%). These differences are highly significant ( $\chi^2 = 26$ ). Although the numbers are too small for them to be tested statistically, a similar difference appears in the figures for the enjoyment of outdoor activities in adult life and interest in gardening, agriculture and horticulture. There is also a clear variation in those mentioning work, with only 7% of the under 30s but 74% of the over 50s including references to it in their life stories.

The influence of books and papers concerned with environmental issues arose in 33% of the life stories of the under 30s, but only in 11% of those over 50. Although the total numbers are not high, this difference is significant at the 5% level. A distinct variation is also apparent in the figures for adult organisations; in this case the point of interest is the type of organisations supported by the different age groups. Those that deal with the natural world, such as the Naturalist Trust and the Royal Society for the Protection of Birds (RSPB), are much more popular with the oldest age group (38% over 50s, 7% under 30s), whereas those, such as Greenpeace and the Campaign for Nuclear Disarmament (CND), which are more concerned with issues relating to people's impact on the global environment are more widely supported by the youngest age group (17% under 30s, 4% over 50s).

When considering groups of factors (Table 5) the differences between age groups reflects the same basic pattern.

Statistically the most significant difference between the numbers in each age group is that for outdoor experiences with  $\chi^2 = 24$ .

TABLE 5. Grouped factors by age groups ( $n = 233$ )

Factor	Age group					
	Under 30		30-50		Over 50	
	Number	Per cent	Number	Per cent	Number	Per cent
Outdoor	19	35	85	67	41	77
Education	32	59	77	61	32	60
People	26	48	67	53	26	49
Work	4	7	65	52	39	74
Organisations	19	35	40	32	33	62
Media	23	42	44	35	9	17
Travel	9	17	27	21	12	23
Negative	14	26	20	16	11	21
Having children	2	4	17	13	4	8
Pets	2	4	11	9	2	4
Religion	3	6	4	3	5	9
Others	9	17	13	10	6	11

TABLE 6. Ranking of main groups of factors by age groups

Factor group	Age group		
	Under 30	30-50	Over 50
Outdoor	4/5	1	1
Education	1	2	4
People	2	3	5
Work	8	4	2
Organisations	4/5	6	3
Media	3	5	6

Another way of examining the differences between the age groups is to look at the ranking of each group of factors (Table 6).

As the middle age group contains 54% of the sample, it is hardly surprising that the order of importance of the factors is almost the same as for the totals (the only difference is the reversal of fifth and sixth). For the over 50s a greater importance of work and membership of organisations is shown. The ranking of factors for the youngest group shows notable differences. The most important groups of factors are education, people and the media. Outdoor experiences are only joint fourth with organisations, while work is eighth.

#### Comparison of Ranked and Autobiographical Factors

Although respondents were asked to rank the influences mentioned, or at least indicate the most important one, only 114 (49%) responded to this request. Of these, 25 said that they were unable to name a single most important factor, so only 89 (38%) gave any ranking of influences. Despite the limited number of responses, it is informative to compare those factors that were ranked with the total number mentioned. Figure 5 shows the individual factors which were ranked most frequently.

The overwhelming importance of the family, listed by 25%, is apparent from this graph. As the number of factors mentioned in the autobiographical accounts was so much larger than in the ranked influences (mean 4.5 and 1.4 respectively), it is difficult to make direct comparisons, so order of importance is used again, and is shown in Table 7.

The most striking fact is the relatively greater importance of the three factors involving people (family, friends, having children) in the ranked reasons compared with factors in the autobiographical accounts. Despite this, the most important five factors in the ranked list include the first four in the life stories, showing essentially the same pattern.

When the groups of factors are compared the same difference emerges, as shown in Table 8.

The most notable feature is the dominance of the people group in the ranked factors. Not only is it clearly the first, but it is far more important than any other group (27% compared with 17% or less). The only other group for which the relative importance in the ranked reasons is higher than in the life stories is 'having children'. The media group is considerably less important in the ranked

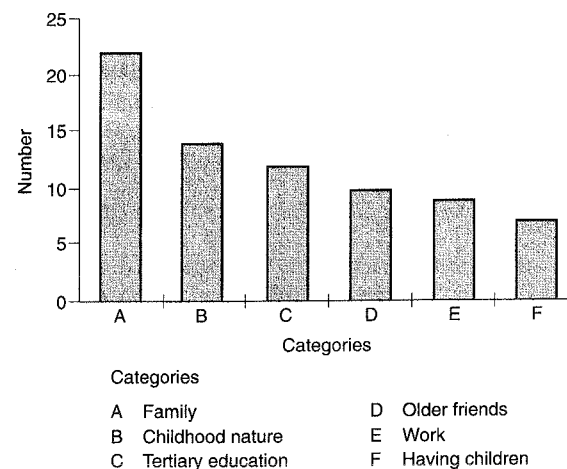
FIG. 5. Graph of main single factors which were ranked ( $n = 89$ ).

TABLE 7. Comparison of single factors—ranked and autobiographical

Factors	Ranked		Autobiographical	
	Per cent	Rank	Per cent	Rank
Family	25	1	36	4
Child outdoor	16	2	55	1
Tertiary education	14	3	47	2
Older friends	11	4	17	8
Work	10	5	46	3
Having children	8	6	10	13/14

reasons. Despite such variations, the first five groups of factors are the same in both lists.

#### Correlations between Factors

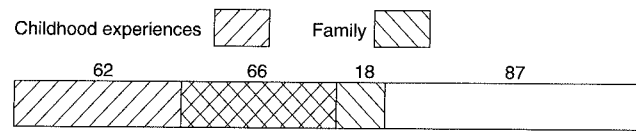
An attempt was made to measure the correlation (if any) between individual factors mentioned in the accounts. This was only possible with the more important factors (>20%). Two cases of significant correlation (at the 1% level) were found. These are shown in Fig. 6, firstly, in Fig. 6a, between childhood experiences of nature and the family and secondly, in Fig. 6b, between childhood experiences of nature and work.

The correlation between childhood experiences of nature and the influence of the family, as shown in Fig. 6a, was expected. Of those who recorded childhood experiences 51% also listed the family, while 78% of those recording the family also listed childhood experiences. In the other case of significant correlation, shown in Fig. 6b, there are considerable differences between the age groups, so

TABLE 8. Comparison of ranked and autobiographical factors in groups

Group	Ranked			Autobiographical		
	Number	Per cent	Rank	Number	Per cent	Rank
Outdoor	20	17	2	145	62	1
Education	18	16	3	141	61	2
People	31	27	1	119	51	3
Work	9	8	4	108	46	4
Organisations	8	7	5	92	39	5
Media	1			76	33	6
Travel	4	4	8	48	21	7
Negative	7	6	6/7	45	19	8
Having children	7	6	6/7	23	10	9
Pets	1			15	6	
Religion	3	3	9	12	5	
Others	6			28	12	

(a) Childhood experiences of nature and family



(b) Childhood experiences of nature and work

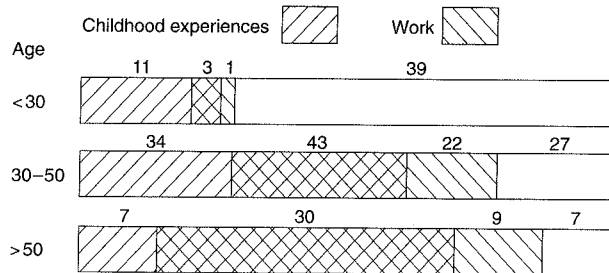


FIG. 6. Diagrams showing relations between single factors ( $n = 233$ ).

they are shown separately. In total, 59% of those recording childhood experiences and 70% of those recording work mentioned both factors. However, these general figures mask considerable variation between age groups. The numbers in the youngest group are so small that little can be deduced from them. The correlation is particularly strong in the oldest group. This means that 56% of the over 50-year-old members of the NAEF were influenced both by their work and their childhood experiences of nature.

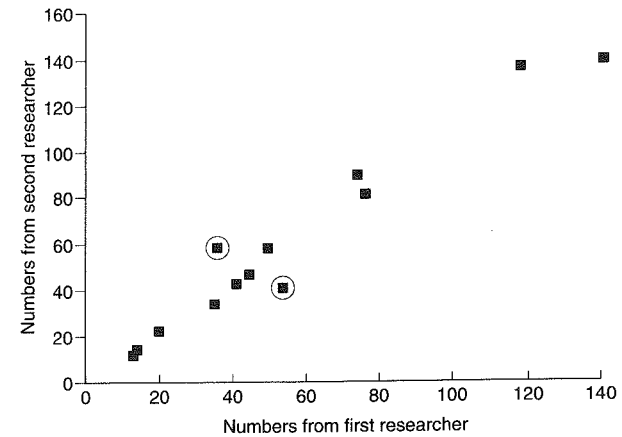


FIG. 7. Graph of group frequencies for two judges.

*Inter-judge Reliability*

An independent preliminary analysis of the returns had been made earlier by another researcher (Palmer, 1993), so it is possible to establish some measure of inter-judge reliability. In the preliminary analysis the groups of categories were slightly different and there were 13 instead of 12, so the single factors were grouped to match the earlier analysis as closely as possible. One judge included newspapers and magazines with books, whereas the other put them with TV/media. This meant that it was not possible to make the groups entirely comparable. Even so, Spearman's rank correlation coefficient is high, with  $r = 0.91$ . Figure 7 shows the relation of the frequencies for the groups of factors from the two judges.

In Fig. 7 the two points representing the groups which were known to be poorly matched (TV/media, books) are circled. The linear relationship between the two sets of observations is clear.

**Conclusions**

The results confirm both Tanner's findings and those of the preliminary analysis (Palmer, 1993), but only in a general, whole sample way. The most influential factor in developing personal concern for the environment is childhood experiences of nature and the countryside. In the life stories there were many vivid accounts of early experiences of the natural world, testifying to their importance. The role of the family and other adults in awakening and fostering such interest was another recurrent theme in all age groups. It is encouraging to note the widespread influence of education, mentioned by 60% of respondents, especially at secondary and tertiary level. This includes not only the stimulation of increasing factual knowledge, but also the influence of teachers' enthusiasm and concern for the environment, specifically mentioned by many respondents. So the more detailed analysis supports the main finding of the preliminary work,

that the factors leading to adult concern for the environment in the UK are similar to those found by Tanner in the USA.

One difference between the UK and USA data, identified in the earlier analysis and confirmed by the present work, was the effect of 'negative' factors, such as media coverage of disasters and experiences of pollution and ill health. Some people cited negative events as being the most significant influences in their whole lives, including two subjects who gave tragic accounts of the death of a family member as a result of environment-related diseases. This is a most interesting result to compare with the findings of Tanner. It would seem that there has been a marked increase in the influence of negative factors on individual thought and action in the past decade. The Tanner study (1980) concluded that subjects were motivated by positive experiences, whereas present data indicate a combination of positive and negative influences upon the thinking of many individuals.

The more detailed analysis revealed interesting similarities and differences between the age groups. Some factors, notably the influence of family and education, were mentioned by a similar percentage across all three age groups. In contrast, there were significant differences between the age groups for other factors. Childhood experiences of the outdoors was of much greater importance in the older age group than in the youngest group. Indeed, for the under 30s outdoor experiences only ranked joint fourth in the groups of factors. This difference is particularly relevant to those planning environmental education courses. The influence of work was of relatively minor importance in the youngest age group, whereas it was the second most important factor for the over 50s. This difference is easily explained by considering the short length of time, if any, the younger group had spent in work compared with the long period, up to 30 years, experienced by the oldest group.

The influence of the media (TV, books and papers) was much greater in the youngest age group, for which it ranked third, than in the oldest group. The effect of books such as Rachel Carson's *Silent Spring* and media coverage of environmental disasters are greatest in the under 30s group. The types of organisation supported by the oldest age group reflected a predominant interest in natural history, whereas in the youngest age group their membership showed more concern for the damage inflicted by human activity on the environment.

In summary, there appears to be a distinct difference between the oldest age group, for whom childhood experiences of nature are of paramount importance, and the youngest age group, who were affected by the media as well as direct experience, both negative and positive. This is understandable when the changes in society over the last 20 years are considered. Television has become a major influence on people's knowledge and attitudes, as it can carry dramatic images of disasters into the home. There has also been a growing awareness of the magnitude of the threat to the environment, which has been spread by publications (books and papers) and organisations such as Greenpeace. This means that young people are likely to be influenced by the threat to and spoiling of distant habitats as well as those nearby in the English countryside.

Two other points of interest were found in the detailed analysis. When considering only those factors which were ranked or stated to be the single most important one, the influence of people was overwhelming. This points to the crucial role of family and older friends, especially teachers, in inspiring and

nurturing a concern for the environment. Finally, the analysis of the data by two separate researchers gave remarkably similar results, lending greater credence to the general conclusions.

It may therefore be concluded that the fine-grained analysis of present data confirm the findings of Tanner (1980), but only in a very general and whole sample way. Rather, the data qualify the work of Tanner; they suggest, for example, the importance of age and the critical need for environmental education research to take this factor into account. The present research also illustrates the importance of multiple factors and the equally important need to take this apparent interaction of factors into account.

Without doubt, the data gathered in this research project carry important messages for those who control educational finance and curriculum development programmes. They provide some guidance on the types of influence which may foster a concern for the environment and so which should be included in school-based courses in environmental education. The urgency of the task of designing effective environmental programmes can hardly be overstressed.

#### Notes on Contributors

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