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# *Significant Life Experiences and Formative Influences on the Development of Adults' Environmental Awareness in the UK, Australia and Canada*

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**SUMMARY** *Environmental educators in Australia (n = 82), and Canada (n = 48) wrote autobiographical statements describing the formative influences and significant life experiences (SLE) which led to their concern for the environment. Content analysis identified the influences/experiences mentioned most often, both as single factors, e.g. 'close family', and as groups of logically related factors, e.g. 'people', a group composed of the factors 'close family', 'older friends', 'friends', and 'having children'. The final lists of single factors were similar but not identical in the two countries, and both differed slightly from the list already derived from a sample of environmental educators in the UK (n = 233). Here we present the single and grouped factors named most often in Australia, then do the same for Canada, and then compare the principal factors in all three nations.*

## **Background**

This article is part of a major international research project which so far involves researchers from 12 nations on five continents. One objective of the project is to identify formative influences and significant life experiences (SLE) in the lives of environmental educators. This is the fifth report published to date on that aspect of the work. The first two (Palmer, 1993; Palmer & Suggate, 1996) present and analyse data specific to the UK. The third (Palmer *et al.*, 1998a) does some of the same analyses for Slovenia and Greece, and then makes cross-cultural comparisons using data from all three nations. The present article extends the analyses

to Australia and Canada, and again incorporates the UK data for comparisons across nations; it is identical in format to the Slovenia–Greece study.

It should be emphasised that there is no particular reason relating to the study's aims and methodology for this grouping of nations. It so happened that results from the three European countries came 'on stream' first, suggesting publication in comparative form, followed by those from Australia and Canada. Another report (Palmer *et al.*, 1998b) makes preliminary comparisons across nine countries—the five just mentioned, plus Hong Kong, South Africa, Sri Lanka and Uganda. Also participating at the time of writing are researchers from South Africa, the USA and Jordan. The total research project and the entire SLE component of it will develop in terms of scope and forms of analysis as the empirical work progresses and findings from other nations become available. Ultimately, we and the other international investigators aim to publish a global overview of the project's findings.

Likewise, further analyses of the data from UK, Australia and Canada are under way, and we plan a trilogy of articles. This, the first of the three, describes our methodology and presents results in essentially quantitative form. In due course, a second article will focus on the theoretical setting of this work, and a third will adopt a more qualitative approach to the analyses.

## Method

The methodology for this study is exactly as described in an earlier UK, Slovenia, Greece article (Palmer *et al.*, 1998a). That is, an outline of the aims of the study and a questionnaire were given to environmental educators in each of the three countries. Participants were asked to provide their approximate age, gender, details of their own pro-environmental behaviours and practical concern for the environment in order to confirm the samples as groups of environmentally aware adults. To this end, a list of seven possible activities relating to pro-environmental behaviour was provided, and the subjects were asked to indicate those in which they regularly engaged. They were also asked to write an autobiographical statement identifying those influences and experiences that led to their environmental concern. Furthermore, participants were 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 terms of the development of environmental thinking and awareness. The information given to participants gave only the general aims of the research, so the autobiographical accounts were unbiased by illustrative examples.

In the UK, 233 responses were returned, in Australia 82 and in Canada 48. Table 1 shows the composition of the samples according to age and sex.

The distribution according to age in the UK permitted some interesting differences to be observed (Palmer & Suggate, 1996). Unfortunately the low numbers in both the youngest and oldest age groups in Australia and Canada render it impossible to make any meaningful comments about differences among age groups in this article. Whilst it might be possible to give some indications of differences between the sexes in some cases, this will be deferred to a later publication. Hence all the following figures refer to whole samples. We note that some of the observed differences could be related to the different age

TABLE 1. Samples in the three countries

	UK	Australia	Canada
Total	233	82	48
Sex			
Female	130	47	22
Male	103	35	26
Not given			
Age			
< 30	54	7	0
30–50	126	63	40
> 50	53	12	8
Not given			

and sex profiles of the samples. Nevertheless there seem to be some interesting similarities among the three countries.

The participants in both Australia and Canada were confirmed as individuals who demonstrate a high level of commitment to environmental concerns, as they were in the UK (Palmer & Suggate, 1996). In Australia the general level of involvement in pro-environmental activities is high, especially in reading about environmental issues (98% of sample), recycling (95%) and buying 'green' products (94%). Even for the least popular activity (membership of organisations and attending public meetings), 64% of the sample said they took part in it regularly. In Canada at least 79% of the group take part in each suggested activity with particularly high percentages being involved in outdoor activities (98%), recycling (96%) and reading about environmental issues (94%).

The autobiographical accounts were analysed into categories of response. So that valid international comparisons could be made, the established categories of influences and experiences were the same as those used in the UK, with three additional ones in Australia and one in Canada as detailed below. It should be noted that 33 single factors had been identified in the UK and later in the analysis these single factors were grouped as appropriate. After classification, the influences mentioned were entered into a database (Microsoft Access). The information was passed to a statistical package (SPSS) and the results then displayed in table and graphical form.

The main results of the study are now detailed. Firstly we present location-specific data for both Australia and Canada, i.e. the categories used with illustrative quotations, the number of factors mentioned by respondents, the single factors most frequently mentioned, and groups of factors. Secondly, comparisons among the three countries are outlined and discussed.

## Results

### Australia

#### *Categories Used in Analysing Autobiographical Accounts*

Thirty-three categories had been used in the analysis of the UK data. Not all of these were used in the analysis of the Australian autobiographical accounts, but

TABLE 2. Categories of influence in Australian accounts

Group	Category	Example
Nature/outdoors (child)*	Child nature/outdoors	(a) I spent the years between the ages of 10 and 16 living in a rural area, swimming in creeks, horse riding through the bush and chasing rabbits. This seems to be what we did all the time. (b) Sensory flashes of childhood: being swooped by magpies; listening to the rain on our tin roof; smelling pine needles under shadowy trees; building cubbies from bracken fern; caring for and sharing life with pets; awe inspiring thunderstorms; the taste, smell and chill of the sea. (c) Living in the country in formative years where trees, river, land were used and appreciated. I often used to walk in the forest or later on drive the car amongst the trees/birds so I could study in the peaceful, beautiful surroundings.
	Child practical/pets	(a) We had chickens, cattle, a dog and a vegetable garden which provided a regular supply of eggs, meat, milk and vegetables. Naturally, the children were expected to participate in the daily chores such as rounding up the cow before school to be milked and ensuring that the animals were fed and watered. (b) I had lots of pets I cared for and loved animals.
Nature/outdoors (adult)*	Teenage outdoors	(a) Probably when I began to surf at about 14 years old. Learnt to appreciate the ocean and became concerned about cleanliness of water in general. (b) Adolescence—grew up on Queensland Gold Coast and spent a lot of time body and board surfing. Without being especially aware of it as such, the contact with nature was strong—crystal clear water, the power of the surf, the passing dolphins, the distant hills—it's still a strong part of my consciousness.
	Adult outdoors	(a) Personal commitment to cycling led to views on transport systems. (b) Ongoing involvement in skin-diving and bushwalking.
	Adult nature	(a) My love of the environment has perhaps most clearly been fostered by the time spent on Kangaroo Island in my early adult life. There I spent a lot of time observing wild life, particularly birds of prey and became familiar with that very special place—'experiencing' nature. (b) Key experiences for me were feeling, experiencing, being involved in and enjoying some vast and magnificent environment.
	Adult gardening, agriculture	(c) Discovery of 'power' of a landscape and refreshment within my soul from bush experiences.
		(a) At a personal level, I found living for 10 years as I did on a 40-acre 'hobby' farm a great experience reinforcing my relationship with the land/nature. The daily existence with wildlife, farm animals, the elements, the seasons has a way of satisfying and restoring the soul.

TABLE 2 (Continued)

		<p>(b) When my wife and I bought our first farm with a rainforest in it, harbouring special orchids, we inadvertently studied nature—we were avid readers of ‘back to the earth’ magazines and articles.</p> <p>(c) The single most important influence on me has been the work and achievements of the Landcare movement in Victoria/Australia—in particular the broadscale revegetation work being undertaken by farmers and landholders to repair degraded land.</p>
Education	Secondary school courses	<p>(a) Schooling—especially Biology classes developed interest in environment.</p> <p>(b) Single most important influence was viewing videos during secondary schooling showing future scenarios, e.g. pollution, living in bubbles.</p>
	Secondary practical work	<p>(a) Probably the most important influence happened when I had to do work experience as part of my school education. I went to a local nursery for 2 weeks. From that time on I knew that I wanted to work with plants and the environment.</p> <p>(b) The greatest thrill of each school year was the <i>nature walk</i>—a day-long walk each spring along farm roads and bush paths discovering nature. This was the most important single influence on the development of my awareness and concern for the environment.</p>
	Tertiary education	<p>(a) In 1989 I enrolled in a Master’s degree in Environmental Studies at the University of Adelaide. This was an excellent course.</p> <p>(b) The opportunity to attend an extended in-service course run by Victoria Association of Environmental Education which generally confirmed my prior beliefs, giving a focus for continued development.</p> <p>(c) When studying Agriculture at Sydney University, I became increasingly aware of the land degradation that had and was continuing to occur in Australia.</p>
Work	Work	<p>(a) In my first teaching job in 1984 I was lucky enough to be appointed to a new school with a strong philosophy of integrated studies and taught a subject called <i>People, Society and Environment</i> for 5 years. This became my grounding in environmental education.</p> <p>(b) In my early years of teaching (age 20) I realised how little young people cared for ‘our earth’. I then became quite active.</p> <p>(c) My interest in all things environmental mushroomed after being responsible for teaching in an environmental education centre.</p>
Travel	Travel—youth	<p>(a) As a geographer, I learnt of larger global issues and as a traveller, I saw these first hand, especially the poverty of South America and India.</p>

TABLE 2 (Continued)

Organisations	Organisations—youth	<p>(a) My real dawning of awareness actually came through participation in Cubs, when I was 9 to 11 years old. A number of activities there got me out in the bush and we had to learn and draw a number of birds and plants. This got me interested in observing nature .... After Cubs I joined the Scouts and was able to start camping in the bush.</p> <p>(b) My first real experience with the larger environment and I guess my concern for environmental issues occurred when I joined cubs at 8 years old.</p>
Religion	Religion	<p>(a) As a biblical Christian I believe that God created a wonderful world that people have been given the responsibility to care for.</p> <p>(b) Underpinning all my involvement in EE and other E matters is my understanding of the Christian Gospel and of our place in the totality of Creation.</p>
Others	Community projects	<p>(a) In 1988 I made a connection with a community organisation called Healthy Cities Canberra, bringing together the concepts of ‘think globally-act locally-respond personally’. I was able to bring an environmental perspective to my colleagues who contributed community health and social justice perspectives. This was a very rapid learning curve and formative time which then led me directly to Environmental Education.</p> <p>(b) The involvement of community groups in our school and working with them in our local area, shifting from global emphasis to local concerns heightened my awareness and involvement.</p>
	Aboriginal culture	<p>(a) Working with Aboriginal people in Northern Territory for four years—cultural ties with the land—awakening in my own soul searching.</p> <p>(b) <i>Red Chief</i>, a novel about Australian Aborigines gave me an extraordinary feeling for the land—a passionate love—I wanted to find out more about our strange, wild and beautiful land.... The most significant influence was probably tied up in the unbelievable survival skills of the aborigines—their mystical culture.</p>
Negative	Pollution	<p>(a) Monitoring of waterways and warnings about the unsafe beaches for swimming was a sobering thought. The broad use of chemicals and insecticides encouraged me to have a vegetable garden.</p> <p>(b) As a young couple with one child and a baby on the way, we discovered we had been living on toxic soil—CCA saturated. We were horrified that this could happen with the council’s consent.</p>
	‘Development’ plans	<p>(a) The debate relating to the damming of the Franklin River in the Tasmanian wilderness (eventually preserved) made me realise that individuals can do a lot.... This is probably the single most important influence because it hardened my resolve to do more.</p> <p>(b) In 1979 a mining company made an application to mine mineral sands on the property and adjacent beaches. After lobbying and many submissions managed to prevent this.</p>

TABLE 2 (Continued)

People	Close family	(a) My mother was a great nature and animal lover. I grew up reading wonderful books on African wildlife and exploring our local beach. I think growing up in a general ambiance of 'nature love' was very influential for me. (b) My parents modeled caring practices such as <i>not littering</i> . (c) Spending time at 2–8 years of age with my father in 'outdoor' pursuits—collecting firewood, bushwalking, camping, hunting. I think this period and that role model was the most important influence on me.
	Older friends	(a) My lecturer in Zoology at the University of Tasmania, showed us undergraduates during a field study trip how man ( <i>sic</i> ) was allowing sewerage to run into a bay and it was having a significant effect on the marine life in that shallow bay. (b) A teacher that had an ability to generate activity and discussion that made one <i>think</i> . One day as part of a general discussion about personal behaviour and the environment she said 'How many of you turn the tap off when you clean your teeth?' and I haven't been the same since! (c) I had a charismatic lecturer who infected me with his passion and commitment.
	Friends	(a) Boyfriend (long term) who was a committed 'greenie', camper, bushwalker. (b) Working with colleagues who promoted good environmental practices.
	Having children	(a) A daughter who actively reads labels and talks about what is good and bad. (b) The birth of my granddaughter in 1994. (c) Nurturing my daughter's environmental 'experience'.
Media	'Negative' books	(a) The writings of Paul Ehrlich, Rachel Carson and Barry Commoner had a profound influence on me as a young person. I read these works for pleasure not as part of formal study. (b) Soon thereafter I read Ehrlich's latest publication, <i>The Population Explosion</i> . The facts seemed to me to speak for themselves ... I remember being shocked even crying at the seemingly inevitable tragedy that appeared set to befall us.

\*For many, the term 'nature' is used synonymously with 'outdoor experiences'. In this study they are only distinguished in the single factors, not in the general groups.

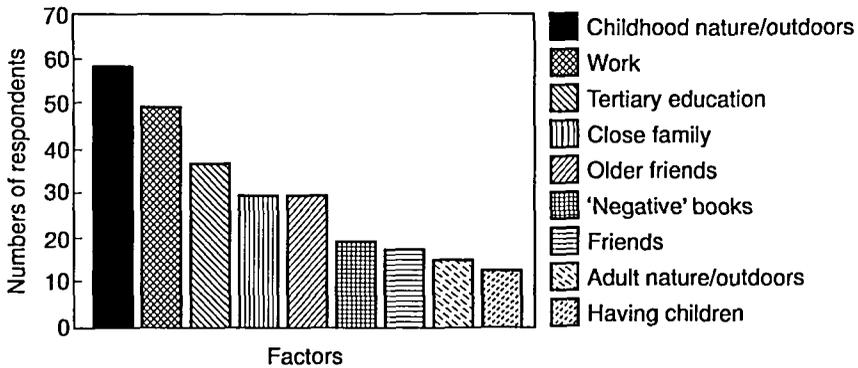


FIG. 1. Most common single factors in Australia ( $n = 82$ ).

three new ones were added, namely 'community projects', 'Aboriginal culture' and 'development plans'. The 22 categories given by five or more (6%) Australians are listed in Table 2 together with short quotes to illustrate the type of response included in each category.

Table 2 illustrates the wide range of factors described in the accounts. The categories were first considered individually, then grouped together for further analysis. As the format of the request for an autobiographical account was 'open' the number of factors mentioned by each respondent varied. The average (mean) number of factors given in Australia was 4.80 compared to 4.50 in the UK and 5.44 in Canada. Indeed, the length of autobiographical accounts was very similar in all three countries.

#### *Most Frequently Mentioned Single Factors*

Figure 1 shows the nine most frequently mentioned single factors in Australia. By far the most important single factor in the Australian autobiographical accounts was childhood experiences of nature and the outdoors, being included by 58 persons (71% of the sample). For example, 'I grew up in a house which was surrounded by a large bush reserve (you could walk for days and see no people). I used to go barefoot and had favourite caves and rocks. I'd imagine that "this was my land" in a spiritual/aboriginal sense—I also believed that I could talk to plants/rocks. Friends and I would pretend to be explorers and follow the creeks. I consciously noticed pollution and when we tried to drink the water we all got mildly sick.... I used to sit on our deck and watch the violent summer storms and rejoice in them. I thought they were celebrations of life/death/life cycle.' And again, 'I believe the single most important influence has resulted directly from my childhood experiences. Here I was steeped in a love of the earth, of the soil that sustains existence, of air, of our eternal sun, our indestructible water and the self-replenishing nature of life. From childhood relationships, I believe, directly arises the knowledge, attitude and hope for our world today.'

The second most common single factor was work, being given by 60% of the sample ( $n = 49$ ). 'My involvement with children has made me aware of the intergenerational responsibilities we all have to protect our environment. My

classroom experience has also highlighted the need to provide students with a means by which they can help protect their environment. It is important to provide students with positive strategies to address problems. This will help young people overcome oft-expressed feelings of pessimism about the state of the world and fears of hopelessness about the future'. 'Obviously, particular events left lasting impressions. One was to be appointed a member of the Australian delegation to the meeting in Quebec in 1945 which established FAD. From 1956 my election as a Fellow of the Australian Academy of Science provided many opportunities, the first being chairman of the committee on National Parks. Later, member and then chairman of the National Committee for the Environment and still later chairman of the publications committee and my involvement in the preparatory work on the book for years 11 and 12 of schools on "Environmental Science" '.

Although less frequently mentioned than the above, tertiary academic courses were important for 43% ( $n = 35$ ). 'The single most important influence was my time completing a Graduate Diploma of Outdoor Education at Latrobe University College of Northern Victoria (Bendigo). I began to understand the modification of the environment, especially in the recreation emphasis of much of outdoor education practice. This led to a major re-evaluation of my own teaching.' 'Up until the age of 19 I could best be described as an *environmental vandal* .... It wasn't until I was in university and studied a course called Resource Management, that suddenly my view of the environment changed. Overnight I became committed to environmental sustainability.'

Close family and older friends, including teachers and lecturers, were both included in 35% of the accounts. 'Several influences spring to mind. My paternal grandmother's love for the bush and animals; maternal grandfather's stories of the wildness, vastness and beauty of the bush; walks with my pastoralist father in our "forest" and long talks with him about the land. He left/encouraged swamp areas so ibis would come to eat liver fluke snails; the parrots their holes in trees; respect rather than hatred for snakes; pet lizards (amongst sheep, dogs); rescuing turtles on the road'. 'The most significant reason was the influence of my Senior Lecturer in Environmental Horticulture. He is one of the most passionate people I have met and his passion for horticulture of the environment largely influenced me'.

Twenty-three per cent of the sample mentioned books or articles about threats to the environment. For example, 'I remember reading *Small is Beautiful* and *Silent Spring* in my teens and they impressed me very much. Also *Animal Liberation* by Peter Singer. So my early influences probably came from books and school. *Small is Beautiful* gave me an interest in appropriate technology, the area I now work in'.

Although given by fewer people, the influence of friends (22%), the enjoyment of nature as adults (18%) and the effect of having children (16%) were described dramatically in some accounts. 'I live on the edge of a large environmental park well known to world bird watchers. Three hundred and seventy species of birds can be found within a 50 km radius of Townsville. In my garden I have juvenile groups of greater bower birds, numerous species of honeyeaters, and a flock of red-winged black cockatoos just to name a few of the inhabitants. Large geckos decorate the walls of my house as I write. (They live behind the paintings)'. 'There was one moment of pure stunning joy whilst watching a sunset over the

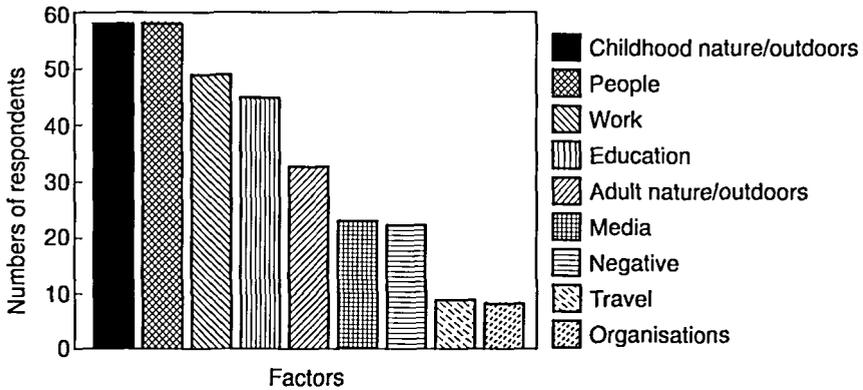


FIG. 2. Grouped factors in Australia ( $n = 82$ ).

ocean from the top of the highest peak around. I have striven to find such places and feelings ever since'. 'Giving birth to my three children would be the most important influence contributing to my present concern for the environment. Wanting them to be able to experience firsthand the beauty of nature and to appreciate life, the land and the sea as I have known them'.

These quotations give some impression of the richness and variety of responses received.

#### *Groups of Factors*

The single factors were grouped appropriately, the groups being shown in the left hand column of Table 2. Even if a respondent included more than one factor from a group in the autobiographical account the entry was only counted once. Figure 2 shows the relative importance of these groups of factors.

Figure 2 shows the great importance of childhood experiences of nature and of people, both of which were included in 71% of the responses. Sixty per cent of the accounts made reference to work as an influence and 55% included some mention of education. Travel and organisations were of much less importance, only being included in about 10% of the sample.

### **Canada**

#### *Categories Used in Analysing Autobiographical Accounts*

As with Australia, not all of the 33 categories used in the analysis of the UK data were mentioned in the Canadian returns. One additional category, 'hunting' was introduced. The 20 categories given by three or more (6%) Canadians are listed in Table 3 together with short quotations to illustrate the type of response included in each category.

#### *Most Frequently Mentioned Single Factors*

Figure 3 shows the nine most frequently mentioned single factors in Canada and shows clearly the importance of childhood experiences of nature in

TABLE 3. Categories of influence in Canadian accounts

Group	Category	Example
Nature/outdoors (child)*	Child nature/outdoors	(a) I think that the early exposure to parks, beaches and the natural world were very influential. (b) Special experiences of communion and wonder with nature when I was young. (c) Probably the most important influence was growing up in a rural environment having the freedom to explore, observe and enjoy nature.
Nature/outdoors (adult)*	Teenage outdoors	(a) Regular camping and canoeing experiences, snow shoeing. (b) At the age of 14, I started surfing (I grew up in California). Spending every possible moment on the ocean, I developed an almost spiritual affinity for the sea.
	Adult outdoors	(a) I continued hiking, camping, fishing and getting into landscape photography. (b) I lived on remote northern reserves in Ontario and did considerable boating, canoeing, hiking, fishing, hunting and wilderness camping.
	Adult hunting	(a) Hunting and the preservation of wildlife sustainable only through a healthy environment. (b) Being an avid hunter of all game species. Being taught not to waste anything I killed. Respecting the right to hunt and the obligation to do it with the ethic of fair chase and quick kill.
	Adult nature Adult gardening, agriculture	Spent many hours wandering and wondering in hardwood forest. (a) Purchased 100 acres of land and did 'back to land' for 4 years ... subsistence lifestyle, gardening, maple syrup, building and living from what was available. Became attuned to natural cycles and connections. (b) When you have a garden you can't help getting hooked on ecology—on how things work, the different creatures from worms to birds that eat them and the sheer magnificence of it all.
Education	Tertiary education	(a) The most significant single experience was a short course (3 weeks) in Rangeland Management which I took down in Rapid City, South Dakota. (b) As an undergraduate I took an Ecology course which gave me an understanding of the key interrelationships in the physical world—à la R. Carson. Majoring in Anthropology helped foster an understanding of human interaction with the physical world.
	Tertiary research	(a) The most formative influences were my graduate education and early career experiences.... I obtained a Master's degree in City Planning. (b) Did Master of Science degree (geography) at York University. Did field research on plant disturbance around Churchill Bay. Plants much more cooperative than the polar bears.

TABLE 3 (Continued)

Work	Work	<p>(a) I began working as a land planner for a group of municipalities in an area of Manitoba with an exceptionally interesting environment and several pressing environmental problems/issues.</p> <p>(b) Most important influence was spending time on the ocean with students.</p> <p>(c) Opportunity to work in wilderness areas (Arctic) that allowed me to work in remote beautiful areas.</p> <p>(d) Taught environmental psychology and became interested in behavioural and attitudinal issues relating to environment.</p>
Travel	Travel—adult	Travelled around the world for 6 months inflicting geography lessons on others.
Organisations	Organisations—youth General organisations	<p>Membership of boy scouts—active outdoor programme.</p> <p>(a) Agencies such as CPAWS (via newsletters, Borealic magazine and volunteer work), WCWC, Nature Conservancy of Canada.</p> <p>(b) Organisations such as SOEA/SUEEA, NAAEE, SNHS.</p> <p>(c) I became involved in the Sierra Club and helped start an environmental group SFERE (students for environmental Rescue—I forget what the last E was for!) together the two organisations set my path to adulthood.</p>
Negative	Negative effects of towns Pollution	<p>Living in Toronto—contact with the outdoors difficult.</p> <p>(a) Seeing the congestion and pollution of large cities and the folly of large industries and lax government officials.</p> <p>(b) The pulp and paper mill in the town was a serious polluter and that bothered me.</p>
People	Close family	<p>(a) My father farmed, worked in the woods in winter, hunted in the fall and trout fished in the spring and I accompanied him in all events.</p> <p>(b) Fishing with father as a child in Northern Ontario.</p> <p>(c) Experiences with my father as a child, when he took me hunting and fishing.</p> <p>(d) My father, my uncle and I spent most of our time at home fishing, snow shoeing and hiking. This is when I cemented my love for the outdoors and my personal commitment to the environment.</p>
	Older friends	<p>(a) My life-long mentors were individuals at SEEDS.</p> <p>(b) When we were 6 years old we went on half-day nature walk around Maligne Lake with the Park ranger's wife. She shared her knowledge and love of nature in such a way that it became one of our most vivid, defining, childhood memories.</p>
	Friends	I was with similar-minded people. We went hiking, backpacking and canoe tripping every weekend we could.

TABLE 3 (Continued)

	Having children	(a) My own children made me think longer term into future (generations ahead) and even further motivated to fight for preservation. (b) The birth of my children strongly committed me to 'walking the talk'. (c) I was living in rural Nova Scotia and had become the mother of two children It was when my children began to question me about the state of the environment that I truly became an 'environmentalist' and also developed an interest in education.
Media	Nature books 'Negative' books	I read encyclopedias and National Geographic and was in awe at the diversity of nature. Paul Ehrlich's works.

\*For many, the term 'nature' is used synonymously with 'outdoor experiences'. In this study they are only distinguished in the single factors not in the general groups.

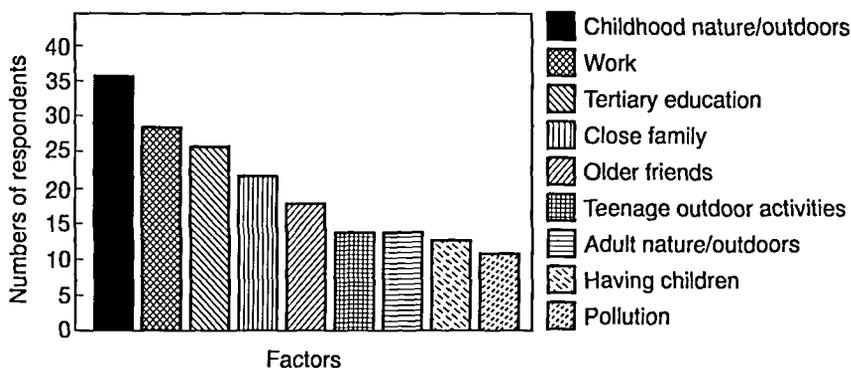


FIG. 3. Most common single factors in Canada ( $n = 48$ ).

developing responsible attitudes towards the environment, with 36 respondents—75% of the sample—giving accounts (often with much feeling) of this. For example, 'Some of my most vivid and happy memories of my childhood are of the small creek and farm pond full of frogs and turtles, the small hardwood forest (second growth), the abundance and diversity of fruit that could be found on our property and the magnificence of the lake'. 'I have spent a great deal of time considering this question and I have concluded that my present advocacy comes from my "Huck Finn" youth. I spent almost my first 10 years in an outdoor setting; amongst fields, forests, ponds and the ocean'. 'I was born near the sea. My experiences with nature include walking barefoot in the sand and playing outside in the woods, eating the cherries from the trees and drinking fresh water from the stream ... During the wintertime we were able to play in the snow, looking at the stars in the sky and making snow angels'.

Work was important to 60% of the sample ( $n = 29$ ), although in varied ways. 'As science consultant for Dartmouth District School Board for about 15 years, much of my energy had been spent developing environmental awareness and providing environmental material to teachers ... and this required that I keep aware of all the work being done by enthusiastic and dedicated environmentalists'. 'During my summers of university, I worked for the Ohio Department of Natural Resources as an Environmental Education Instructor. The first summer, I worked outside Columbus, with a group of city children who spent most of their time on the streets of Hough, Columbus's answer to Harlem .... My group of twelve 15-year-olds had to spend 1 week cleaning up garbage at a local reservoir. That Monday night, I did a presentation on birds of prey .... I had slides, hand outs, and used a variety of games and activities to get them to understand as much as possible about these birds .... By Friday we were all pretty fed up with cigarette butts and litter. I had decided that after lunch we would break the rules and go swimming. But at 10.30 (I can't believe I remember it even now), one of the boys came up to me and told me he had seen a bald eagle. I laughed—this kid hadn't even been able to recognize a sparrow earlier in the week! But he proceeded to reiterate all that I had shared with him about eagles ... then he took me over to where he had seen his bird. And we waited .... And then I heard it, before I saw it .... Circling above, the first bald

eagle I had ever seen in that area of the reservoir. And in fact, there were two of them, the first nesting pair seen in Worthington County in 55 years. That is when I knew that all I really cared about was passing on my concern, my interest and my passion for the environment’.

Of almost equal importance, being mentioned by 54%, was tertiary education. ‘In 1993, I began a Master in Environmental Education at the Université du Québec à Montréal (UQAM). I discovered this learning model called “Action Research for Community Problem Solving” (AR:CPS). I believe this pedagogic model offers promising possibilities’.

The influence of close family (parents, grandparents and siblings) was important to 46% of the sample. This was often linked with childhood experiences of nature, as in the following: ‘I used to go hunting with my father in a conservation area which was a large expanse of oak trees, abandoned apple orchards, pine woods and swamps. Deer were plentiful in this area and we would build a blind in the woods before the hunting season opened and then hide ourselves in the blind to wait for white-tailed deer. I remember my father sitting with his back against huge oak trees, vigilant but relaxed .... My father was always happiest, most at peace, most in harmony with himself and with me when we were together like this, in this place, doing this sort of thing.’ Others were more specifically related to people. ‘I certainly credit *my father* with my love of the outdoors. He was an amateur naturalist and shared his enjoyment in learning about the environment’.

Older friends, such as teachers and university professors, were given by 37% of the Canadians. For example, ‘During those years I had two principals that provided the leadership and role modelling for developing and sharing innovative programs. One was Dr X, a leader in math curriculum development and teacher professional development. The second was Mrs Y, who in the late 1970s developed one of the first “whole school” environmental education curricula in Alberta, called “A Classroom As Big As All Outdoors”, which integrated all subject areas. It was from these two leaders that I drew inspiration.’ Others gave lists of people: ‘Pre-service training with Dr X—ecology, field trips, discussion. Field trips/nature studies/hikes—plant identification, camper, natural history: environmental educators X, Y and Z’.

The number who mentioned teenage outdoor activities and the enjoyment of nature as adults was the same, being 29% of the sample. ‘I can definitely say what gave me a lifelong total dedication to the environment and that was a Grade 10 high school 3-day overnight camping experience which was a requirement within the physical education course. From that magical outdoor awareness I worked at summer camps.’ ‘I spent weekends in spring and summer camping and fishing .... My friends and I snowshoed, cross-country skied or skated most weekends in winter when I was 11 to 21 years of age.’ ‘I love nature, hiking in the mountains, swimming, scuba diving’.

Having children had a profound effect on 27% of the sample, for example, ‘The birth of my daughter brought to light in me the importance of caring for our earth. We will some day pass it on to our children.’ And finally pollution affected 23% of the Canadians. ‘When my daughter was 9 we would talk about my youth and what I saw and experienced. It saddened me to realize she will never gaze on the many wonders that my eyes have seen.’ ‘The common activities which most people perform with no thought for the environmental

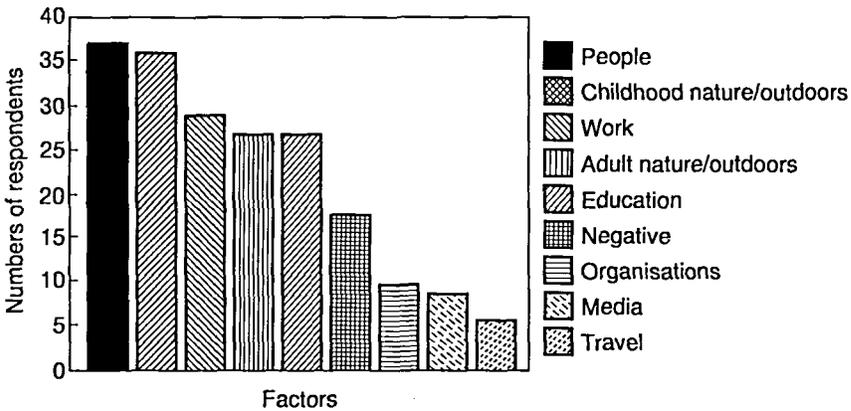


FIG. 4. Grouped factors in Canada ( $n = 48$ ).

effects—waste of resources, whether it be water, paper, food, energy; the overuse of pesticides and the greed of industry’.

#### *Groups of Factors*

The single factors were again grouped appropriately, as shown in the left-hand column of Table 3. Figure 4 shows the relative importance of the nine most frequently mentioned groups of factors.

Clearly the two most important groups of factors were people and childhood experiences of nature and the outdoors, being referred to by 77 and 75% of the sample respectively. The next three groups of work, adult enjoyment of nature/outdoors and education were mentioned by 60 or 56% as shown on Fig. 4. The other groups were of considerably less importance.

### **International Comparisons: Results and Discussion**

#### *Comparison of Engagement in Environmental Activities*

Figure 5 shows the degree to which participants in the three samples are involved in pro-environmental activities, thus enabling us to identify them as groups of environmentally aware and concerned individuals. The average number of activities (out of a maximum of seven) undertaken was 5.2 in the UK, 6.0 in Australia and 6.1 in Canada. These figures alone show the high level of commitment to environmental issues of all of the samples and particularly of the Australians and Canadians. We note that the first four activities, ‘reading’, ‘buying green’, ‘recycling’ and ‘outdoor activities’ are undertaken by at least 80% of all three samples. It is also noticeable that in the other three activities the level of undertaking in the UK is considerably lower than that in both Australia and Canada.

#### *Most Frequently Mentioned Single Factors*

Figure 6 shows the most important (in terms of frequency of mention) single factors in the three countries. The first four of these, ‘childhood nature’, ‘work’,

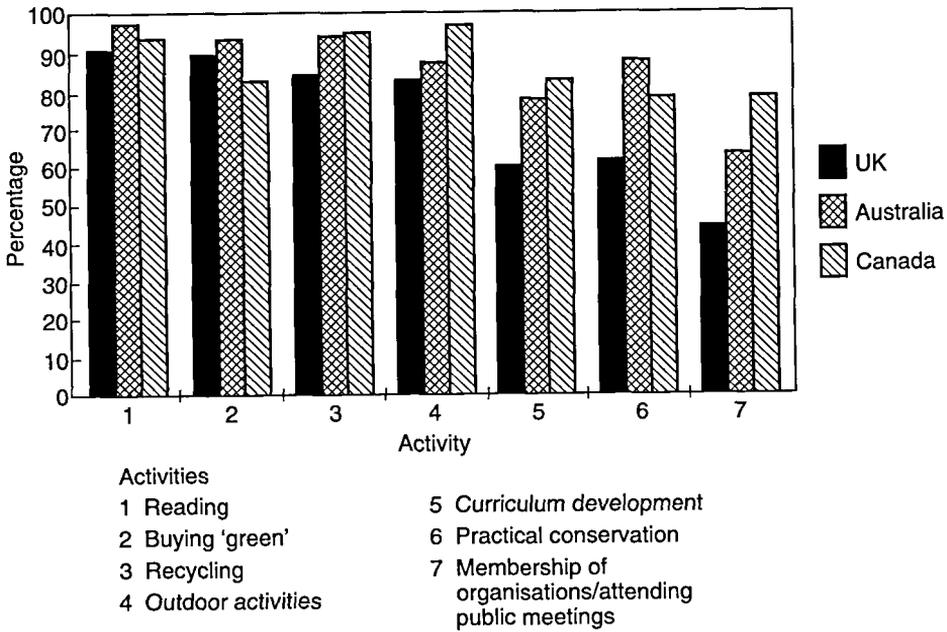


FIG. 5. Pro-environmental activities in the UK, Australia and Canada.

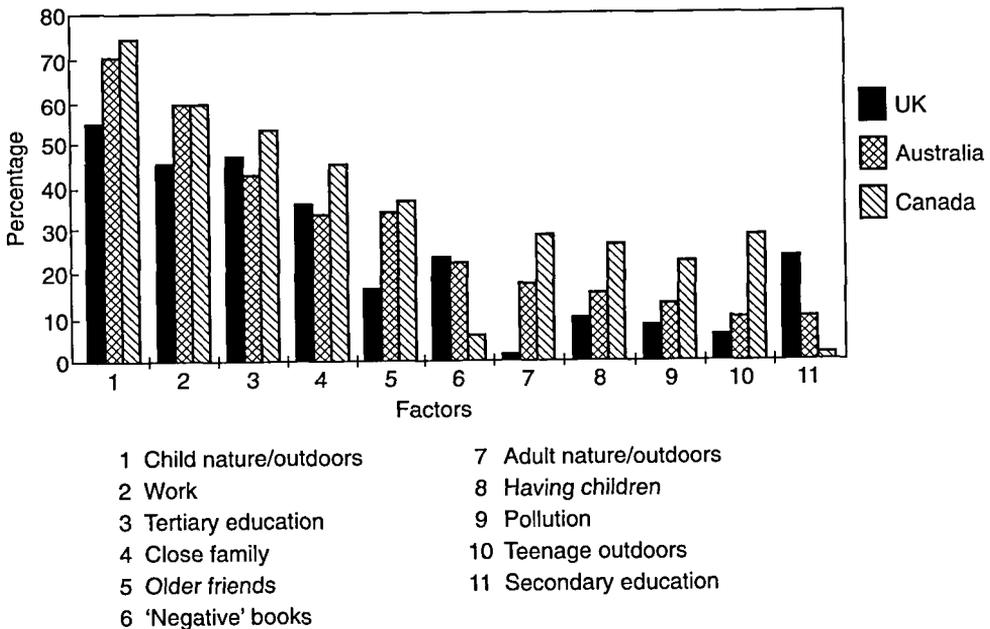


FIG. 6. Single factors: three country comparison.

TABLE 4. Single factors by rank (up to 6)

	UK	Australia	Canada
Childhood nature/outdoors	1	1	1
Work	3	2	2
Tertiary education	2	3	3
Close family	4	4	4
Older friends		5	5
'Negative' books	5/6	6	
Teenage outdoors			6
Secondary education	5/6		

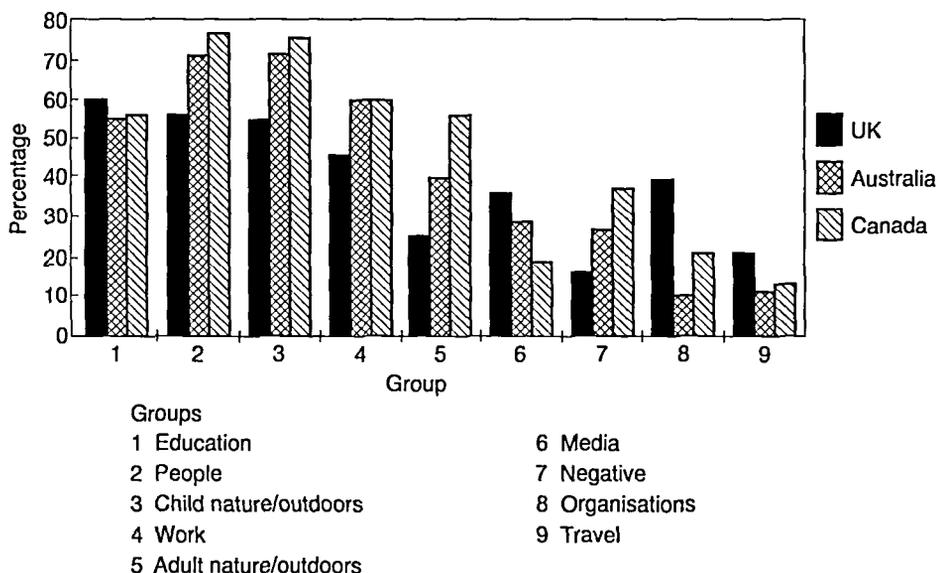


FIG. 7. Grouped factors.

'tertiary education' and 'close family' are comparatively important in all three countries. Indeed, when the factors are analysed by rank (Table 4), the similarity in importance of these four factors is remarkable.

After the first four clear 'lead' factors in Fig. 7, the next three, namely 'older friends', 'negative books' and 'adult nature' are considerably less important in one of the countries than in the other two. For the two factors of 'having children' and 'pollution', there appears to be a similar pattern of variation, with the higher percentage being in Canada and the lower one in the UK. The last two factors, 'teenage outdoor experiences' and 'secondary education' are much more important in one country than in the other two.

#### *The Importance of Grouped Factors, General Conclusions*

Figure 7 shows a three country comparison of the relative importance of the grouped factors. It is clear that the percentage mentioning 'education' is remark-

TABLE 5. Grouped Factors by Rank (up to 8)

	UK	Australia	Canada
Experiences of nature/outdoors	1	1	1
People	3	2	2
Education	4	3	3
Work	2	4	4
Media	6	5	7
Organisations	5	7	6
Negative	8	6	5
Travel	7	8	8

TABLE 6. Experiences of nature: three-country comparison

	UK	Australia	Canada
Mentions/returns	163/233	68/82	41/48
Percentage	70%	83%	85%

ably similar in all three countries. For the next three groups—'people', 'child nature' and 'work' there is a similar pattern, with the UK being lower in percentage terms than the other two countries, but nevertheless showing these factors as important. The other groups of factors show variation among the countries, but this is not statistically significant.

A slightly different way of comparing the relative importance of groups of influence is to look at their ranks in each country. If the various groups of experiences in nature are combined and entered into tables of rank (Table 5), then a very clear pattern can be seen. There are four leading groups, ('experiences of nature', 'people', 'education' and 'work') with 'experiences of nature' clearly in first ranked place across all three countries, three intermediate groups ('media', 'organisations', 'negative experiences') and one less important group ('travel').

Finally, Table 6 illustrates the overwhelming importance of the experience of nature in all three samples when childhood and adult experiences of nature and the outdoors are combined. It is interesting to note that the percentage of Canadians and Australians referring to nature and the outdoors is particularly high. Many of these accounts are intense and 'dramatic', giving a feeling of the importance of wilderness or 'nature in the raw' as a formative influence.

As was the case with the UK, Slovenia, Greece data analysis (Palmer *et al.*, 1998a), results presented here suggest the importance of providing young people—indeed people of all ages—with opportunities for positive experiences of nature and the countryside. It is those 'in' and 'with' the environment experiences that appear to be fundamental to the development of long-term environmental awareness and concern. Also, our results highlight the critical influence of people, notably the family and other adults, including teachers, in inspiring and developing environmental awareness and behaviours. Furthermore, they show the importance of education courses; teaching which addresses such matters as pollution, environmental degradation and community aware-

ness of both local and global issues. The overall results confirm, in general terms, key findings derived from data in Europe and pave the way for more in-depth qualitative analysis and comparison with data from other continents—work which, as mentioned at the outset, is currently in progress.

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