

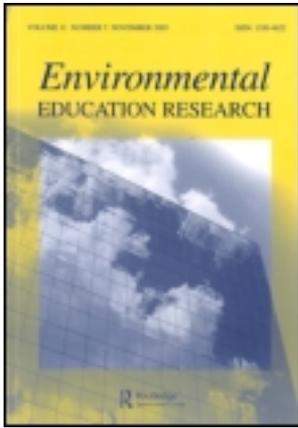
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Significant Life Experiences Revisited: a review of research on sources of environmental sensitivity

Louise Chawla ^a

^a Whitney Young College, Kentucky State University, USA

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Significant Life Experiences Revisited: a review of research on sources of environmental sensitivity

LOUISE CHAWLA *Whitney Young College, Kentucky State University, USA*

SUMMARY *Beginning with the study of significant life experiences initiated by Tanner, this article reviews a growing body of related research in the form of surveys, interviews, and questionnaires that explore people's accounts of the sources of their environmental interest, concern, and action. The questions, methods, and results of studies in this field are closely compared. In conclusion, the article notes that the experiences that people describe can be understood as exchanges between the 'outer environment' of the physical and social world and the 'inner environment' of people's own interests, aptitudes, and temperament, and that more attention needs to be paid to the influence of this 'inner environment' of individual differences.*

Introduction

With his 1980 article, 'Significant life experiences: a new research area in environmental education', Tanner inspired a growing line of related studies: other open-ended surveys similar to his own; interview studies; and questionnaires based upon the categories derived from the surveys and interviews. Because this work involves the qualitative analysis of people's autobiographical recollection, it stands apart from the great body of environmental education research, which, as Marcinkowski has observed (1993, p. 39), has been overwhelmingly quantitative. Marcinkowski noted that critical reviews have focused on this quantitative base, whereas there has been no published attempt to synthesize existing qualitative research. In this article I address this omission with respect to the line of studies of significant life experiences that Tanner introduced.

This retrospective research forms the foundation for the concept of *environmental sensitivity*: the major 'entry-level variable' in Hungerford and Volk's (1990) model of responsible environmental citizenship. Their model identifies

other major 'ownership' and 'empowerment' variables that also appear to be associated with responsible environmental behavior: in-depth knowledge about issues, personal investment, knowledge of and skill in using environmental action strategies, an internal locus of control, and the intention to act. Environmental sensitivity, therefore, is just one of several variables that contribute to the creation of citizens who will work to maintain 'a varied, beautiful, and resource-rich planet for future generations' (Tanner, 1980, p. 20). Nevertheless, because it is the first major variable in what is hypothesized to be a linear sequence from entry to ownership to empowerment, environmental sensitivity is important to understand. In Hungerford and Volk's words, it is a 'prerequisite', or at the very least a variable 'that would enhance a person's decision-making', when environmental actions are taken.

Early Studies

Because Tanner (1980) and Peterson (1982) published in close succession, their studies will be reviewed together. They represent two parallel lines of this research tradition: an investigation of the backgrounds of members of environmental organizations (Tanner) and environmental educators (Peterson). By itself, teaching or membership in an organization cannot be equated with the 'informed and responsible activism' (p. 20) that was Tanner's developmental goal. It is possible to be a passive member, and to teach about the environment without being personally engaged. Tanner, however, ensured activism by surveying staff and officers of leading national conservation organizations, and Peterson interviewed environmental educators with a demonstrated commitment to their field. Therefore both studies explored antecedents of dedicated action.

The two studies also represent the two main methods that this research has followed: open-ended surveys (Tanner) and structured interviews (Peterson). Other studies have followed these methods or applied questionnaires based on their results. The advantage of the surveys is that they can reach large samples over wide geographic areas. The interview studies, which have been limited to smaller samples, have the advantage of allowing in-depth probing and clarification.

Tanner began his work by reading 11 biographies and autobiographies of conservationists, in which he found recurring accounts of 'many childhood hours spent alone or with a few friends in a more or less pristine environment which, in some cases, was lost to commercial development' (p. 21). With the hypothesis that these may be critical experiences, he sent an open-ended survey to staff and officers at the National Wildlife Federation, The Nature Conservancy, the National Audubon Society, and the Sierra Club. In his letter he asked recipients to provide an autobiographical statement that identified the formative influences which led them to choose conservation work, the approximate years of the influence, and a resume of conservation activities.

The results are shown in Table 1. Tanner stressed that he was conservative in his analysis. For example, in addition to the 35 (of 45) accounts (78%) that featured interaction with natural areas, nine other accounts mentioned outdoor youth groups or school programs or parents' love of nature; but because of the brevity of these mentions, he did not tally them in this category. Tanner also

TABLE 1. Influences on choice of conservation work

Influence ^a	% of respondents
Natural areas	78
Habitat: frequent contact	58
Parents	47
Teachers	31
Books	29
Other adults	27
Habitat alteration	24
Solitude outdoors	7
Miscellaneous	31
Travel abroad	11

Note: Adapted from Tanner (1980); $n = 45$ (37 males, 8 females). ^aA majority of these influences first occurred during childhood or adolescence.

noted that the salience of natural areas may have reflected the fact that respondents belonged to groups dedicated to the preservation of wilderness and wildlife. He recommended that future research should be done to explore 'the origins of those who are active in other kinds of environmental issues, such as urban environmental problems or alternative energy sources' (p. 23).

Peterson (1982, p. 8) identified Tanner's work as the most pertinent research yet done with regard to environmental sensitivity. But whereas Tanner asked his subjects what led them 'to choose conservation work' (in keeping with his interest in antecedents of responsible environmental action), she explored affective aspects of her subjects' lives (in keeping with her attempt to distinguish sensitive appreciation for the natural world from action). She first asked, 'What factors or experiences do you feel were instrumental in developing your attitude toward the natural environment?' (p. 96), and later she asked about her subjects' development of 'environmental sensitivity' and 'interest in and/or dedication to the field of environmental education' (p. 97). Therefore she alternatively explored attitude, sensitivity, interest, and dedication. She also asked specifically whether her subjects spent time in the woods alone or with family or friends, and whether they were influenced by particular individuals.

Despite these different questions, the two studies produced some markedly similar results. When Peterson listed influences according to their rate of mention, most of her categories can be related to those of Tanner: the outdoors, family, the study of natural systems, books, habitat alteration, and love for the area in which raised (which probably overlaps with Tanner's category of 'habitat', or a place with which the subject had frequent contact). (See Table 2.) Although Peterson never defined what the category 'outdoors' included (sports fields, yards, and streets as well as woods?), her examples suggest that the natural environment was often mentioned. As a review of succeeding studies shows, most of these categories have proved recurring.

Tanner's and Peterson's samples were predominantly men: 82% of Tanner's sample and 77% of Peterson's. This male bias may reflect their samples'

TABLE 2. Influences on attitude toward the environment

Influence	% of respondents
Outdoors	91
Family vacations	68
Childhood play	50
Youth groups/camp	41
Hunting/fishing	45
Family	59
Study of natural systems	45
Love for area in which raised	32
Professional responsibility	27
Habitat alteration	23
Environmental organization	18
Books	18
Peer sensitivity	9

Note: Adapted from Peterson (1982); $n = 22$ (17 males, 5 females).

association with conservation issues, whereas women have taken leadership in struggles to protect neighborhoods from traffic and pollution. This bias may also explain the fact that 45% of Peterson's sample mentioned hunting and fishing as their outdoor activities, as did more than a third of Tanner's subjects.

Subsequent Surveys

In this section and the next I review open-ended surveys and interview studies that have built upon the work of Tanner and Peterson. These later researchers have broadened the populations sampled in terms of age, sex, ethnic identity, and nationality. The results have shown general consistency in the main categories of responses, along with some significant variations.

The most ambitious mail survey to follow Tanner's has been that of Palmer (1993). Like Tanner, she constructed an open-ended survey, which she sent to all members of the National Environmental Education Association of the United Kingdom. The response rate was exceptional: 232 usable returns out of 238 mailed, from 102 men and 130 women. Palmer wisely verified the environmental commitment of this large sample by asking respondents to fill out a checklist of environmental activities in which they regularly engaged. Responses showed that over 90% took part in at least some actions such as wildlife gardening, 'green' purchasing, recycling, or membership in environmental organizations; and therefore seemed to qualify as environmentally informed and responsible citizens.

Palmer (1993) then asked for an autobiographical statement identifying experiences that led to this 'practical concern', an account of what respondents considered to be their most significant life experience, and their views on which years were particularly memorable in their development of positive attitudes toward the environment. Like Tanner (1980), she performed a conservative

TABLE 3. Influences on practical concern for the environment

Influence	% of respondents
Outdoors	91
Childhood outdoors	42
Outdoor activities	39
Wilderness/solitude	10
Education	59
Higher education	37
School courses	22
Family	38
Organizations	36
TV/media	23
Friends/others (including teachers)	21
Travel abroad	19
Negative issues	18
Books	15
Becoming a parent	9
Pets/animals	6
Religion	6
Miscellaneous	15

Note: Adapted from Palmer (1993); *n* = 232 (102 males, 130 females).

content analysis in which she attempted to ensure reliability by ‘scoring only those responses to which explicit or prominent references were made’ (p. 27).

Palmer’s results are presented in Table 3. Her category of the ‘outdoors’ apparently ranked highest in number of mentions, with the subcategories ‘childhood outdoors’, ‘outdoor activities’, and ‘wilderness/solitude’ being noted by 42, 39 and 10% of her respondents, respectively. She concluded that, ‘The results confirm Tanner’s finding that childhood experience in the outdoors is the single most important factor in developing personal concern for the environment’ (p. 29). However, it may be noted that several other factors shown in Table 3 were mentioned by almost as many respondents. Also, when asked to state their single most significant life experience or influence, 80 of Palmer’s 232 subjects responded. In this case—which may be taken as another measure of the importance of a factor—21 identified parents or other close relatives, compared to 16 who identified childhood outdoors.

Because Palmer (1993) and Tanner (1980) created distinct categories of analysis, it is difficult to compare their findings. Palmer, like Peterson (1982), does not explain what the category of the ‘outdoors’ contains, whereas Tanner defined outdoor experiences as ‘interaction with natural, rural, or other relatively pristine habitats’ (p. 21). (In a personal communication, 1995, however, Palmer has equated it with natural areas.) Other categories clearly differ. Whereas Tanner had categories for ‘parents’ and ‘teachers’, Palmer formed a combined category of ‘parents/close relatives’, separated ‘education’ from ‘teachers’, and included teachers under ‘friends/other individuals’. She also created eight categories that do not appear in Tanner’s analysis.

Her new category of 'disasters/negative issues' deserves particular attention. She hypothesized that between the late 1970s, when Tanner conducted his research, and the late 1980s, when she did hers, there may have been 'a marked increase in the influence of negative factors on individual thought and action' (Palmer, 1993, p. 27). The results fit this prediction. Whereas Tanner observed that not a single person mentioned a negative experience such as 'I grew up in the city impressed by how awful it was' (1980, p. 23), 18% of Palmer's sample referred to negative influences such as environmental catastrophes, nuclear threats, animal cruelty, waste, and pollution. In addition, her category of miscellaneous responses included negative reactions to living in a town or concrete jungle (nine respondents) and worries about health effects of environmental problems (seven respondents): arguably answers that could be grouped under 'negative issues'. It is impossible to determine, however, whether this difference reflects an increase in the influence of negative factors during the decade between the two studies, as Palmer hypothesized, or differences between the samples (British educators versus United States conservationists). Other important new categories are membership in nature organizations and TV/media.

In an interesting follow-up article, Palmer and Suggate (1996) attempted to examine cohort differences by dividing respondents into three age groups: those under 30, 30–50, and over 50. Unfortunately, the 'under 30' group turned out to be predominantly women (83%), whereas the 'over 50' group was predominantly men (68%), so that age and gender were confounded.

Nevertheless, disaggregated by group, the data show intriguing patterns. As a significant life experience leading to environmental concern, secondary education declined in mention rate from the youngest to middle to oldest group (30 to 23 to 19%). So did 'negative' books about environmental problems (33 to 26 to 11%). Other factors, however, increased in mention rate: childhood experiences of nature (25 to 62 to 70%), work (7 to 52 to 70%), and membership in nature organizations (7 to 10 to 38%). In other words, sample members who were younger and predominantly female reported that they were more influenced by secondary education and negative books, whereas members who were older and predominantly male were more likely to say they were influenced by childhood experiences of nature, nature organizations, and work. These results suggest that it will be important for future studies to separate the effects of age and sex, and to explore these differences further. Similar surveys that are currently being collected or analyzed under Palmer's coordination in the United States, Canada, Greece, Slovenia, and other countries may provide further insight (Palmer *et al.*, 1996). (See the articles by Palmer and others in this issue.)

An additional small open-ended survey was conducted by Votaw (1983) with eight summer interpreters in the Denali National Park in Alaska. When respondents were asked to list and prioritize 'the antecedents that they felt contributed to their attitudes' of love and respect for the natural environment (p. 5), experiences of the natural world—usually before the age of 14—were ranked first or second by all eight, and adult role models by seven—in six cases family members, in one case a teacher (pp. 6–8). As Votaw summarized his results, the two common antecedents were 'the natural environment and in most cases an adult' (p. 5).

TABLE 4. Influences on interest in the environment

Influence	% of respondents
Childhood natural areas ^a	88
Vacations/trips	58
Play outdoors	22
Camp	8
Parents	27
Other relatives	20
Natural curiosity	15
Teachers	11

Note: Adapted from Peters Grant (1986); $n = 24$ (8 males, 16 females). ^aRecalculated from summary of raw data.

Subsequent Interview Studies

Most recent studies of significant life experiences have been conducted through structured or semistructured interviews. In the first interview study to follow that of Peterson (1982), Peters Grant (1986) asked a sample of 18 female and 6 male volunteer marine docents on the New Hampshire coast whether 'there were any significant persons or events which you believe contributed to your interest in the natural environment?' (p. 88). Although she cited the work of Tanner, Peterson, and Votaw, who found that outdoor experiences were the most common influence, she did not look for this category. Fortunately, she provided a summary of each respondent's answers in an appendix, so that it is possible to reanalyze her data. When this was done, childhood experiences of natural areas turned out to be most frequently mentioned (by 88% of the docents), followed by parents, other relatives, teachers, and what she called natural curiosity (e.g. 'I preferred to be outdoors'). (See Table 4.)

Another study, by Gunderson (1989), focused on environmental educators and consisted of interviews with 12 elementary school teachers, who were asked, among other things, to 'describe significant life experiences which have influenced you to become an environmental educator' (p. 48). In this sample, the predominant influences were time in the outdoors and former teachers: both were mentioned by 10 of the 12 teachers (83%). Other leading responses were authors, parents, conservation organizations, and college field courses, which were all mentioned by approximately half of the respondents (p. 48).

More recently, researchers have investigated whether similar responses are given by more diverse groups in terms of ethnicity, nationality, and types of environmental engagement. James (1993) interviewed 50 environmental educators who were of African American, Asian American, Native American, Latino, and multiracial backgrounds. As in previous studies, respondents frequently cited outdoor experiences and mentors or role models—in particular family members—as reasons for their career choice. A new category that ranked second in order of mention was 'job opportunity': being recruited into the field

TABLE 5. Influences on path to work in environmental education

Influence	% of respondents
Outdoor exposure	64
Camping	24
Youth groups	12
Exposure to rural settings	18
Parks & open space	24
Job opportunity	54
Mentors	42
Family members	24
Teachers	12
Supervisors/co-workers	12
Inherent interest	36
Community concern	34
Specific issues	30
Community health	14
Social justice	12
Science	26
Spirituality	26
Personality	24
Reading	22
Cultural identity	20

Note: Adapted from James (1993); $n = 50$ (27 males, 23 females).

by a friend or professional recruiter. Community concern and community-related issues such as social justice and health also figured prominently. (See Table 5.)

Sward (forthcoming) and Chawla (forthcoming) both sought to extend research to new nationalities and a broad range of environmental engagement. Sward had Peterson's questions translated into Spanish and used them to

TABLE 6. Influences on attitude toward the environment

Influence	% of respondents
Outdoor experiences ^a	88
Environmental destruction	41
Education	35
Scout movement	29
Environmental job	24
Raising animals/plants	18
Innate affinity toward nature	18
Teachers and peers	12
Concern for future generations	6

Note: Adapted from Sward (forthcoming); $n = 17$ (14 males, 3 females).^aMost participants spent time in natural areas while interacting with family members (76%) and friends (65%) during youth.

TABLE 7. Influences on commitment to environmental protection

Influence	% of respondents
Experience of natural areas	77
Family	77
Parents	64
Others	13
Organizations	55
Negative experiences	39
Habitat destruction	23
Pollution, radiation	16
Education	38
Friends	32
Vocation	27
Sense of social justice	25
Book or author	20
Principles/religion	15
Concern for children/grandchildren	4

Note: Adapted from Chawla (forthcoming); *n* = 56 (35 males, 21 females).

interview 17 El Salvadoran environmental professionals (14 men and 3 women) who worked in a variety of positions: environmental education, conservation planning, environmental action or research, and sustainable development. As in Peterson’s original study, the influences on environmental attitudes cited most often were outdoor experiences in natural or rural settings—which were usually enjoyed while interacting with family and friends during youth. In keeping with El Salvador’s history of war and environmental devastation, however, the second most common influence was witnessing environmental destruction. Formal education was also often mentioned, as were outdoor organizations like the Scouts and the influence of their job itself. (See Table 6.)

In 1995 (Chawla, forthcoming), I conducted a two-nation study of 56 environmentalists in the United States and Norway with an even broader range of action: recycling and waste management, pollution and radiation, transportation, land use planning, habitat and wildlife preservation, environmental education, and the promotion of sustainable lifestyles. My purpose was, as Tanner (1980) advised, to explore the origins of those who are active on environmental issues beyond wildlife and conservation. Nevertheless, regardless of people’s field of work, the same reasons were given for environmental commitment: the experience of natural areas; family role models; organizations; negative experiences like pollution, radiation, or witnessing habitat destruction; education; friends; and the influence of their job. (See Table 7.) I also examined the age associated with each experience and found that natural areas, family members, organizations, and education were salient in childhood, that education and friends were salient during the university years, and that organizations and vocation were salient in adulthood.

In all of the preceding research, when people explained the sources of their environmental career choice, activism, or environmental concern or interest, similar answers recurred: positive experiences in natural areas, adult role

models, environmental organizations, education, negative experiences of environmental degradation, books and other media, and on-the-job experience. Yet a limitation of all of the research reviewed above is that none of it is comparative, and therefore it allows no comparative statements. It cannot help us answer the question: Do experiences that characterize environmentalists and environmental educators also *distinguish* them from other members of the public? Nothing in the above results rules out the possibility that people who are indifferent, or even antagonistic, to environmental protection may not have had similar experiences.

The need for this caution is underscored by the results of the first interview study with a comparison group. Myers (1997) interviewed 11 male and 14 female undergraduates, who were evenly divided between ethnic minority and nonminority students and between environmental studies majors and majors in other areas. He questioned them about how they came to decide on their major, their environmental attitudes, whether they had any especially meaningful place, and specifically whether they had had a meaningful childhood place. When asked how they rated their environmental concern, all rated it as moderate to very strong; and there were no differences between the environmental majors and nonmajors in incidence of positive natural place experiences in childhood, in positive or restorative feelings in response to nature, or in negative reactions to the destruction of a familiar environment. The environmental majors reported a few more positive wilderness experiences, more family role models regarding nature, and more spontaneous descriptions of positive childhood experiences of nature. Above all they differed in that they were more likely to describe meaningful identification with a natural place (ten versus one). Minority students differed little from nonminority students in most measures, except that they were less likely to report positive childhood experiences of nature when asked directly, to describe a meaningful place or place identification, to report family role models regarding nature, and to be suburban or rural.

As Myers (1997) noted, the fact that both environmental majors and nonmajors reported positive nature experiences in childhood, negative feelings about witnessing environmental destruction, and a sense of the restorative effects or beauty of nature suggests that these experiences, by themselves, do not predict commitment to an environmental career. What research on significant life experiences needs to focus on, he argued, is how the significance of experiences is constructed. The recurring responses in this research, he noted, need to be thought of not as individual factors, but as 'a configuration that reflects the ways individuals are making choices in, and sense of, their lives' (p. 9). In this light, it is notable that, in all studies of this topic, most respondents give a cluster of reasons for their environmental interest or actions.

In interpreting Myers' results, it is important not to confuse his distinction between environmental majors and nonmajors with a distinction between environmentally informed and active citizens and those who are not, because all of the students in his sample reported environmental concern, and there are many routes into responsible environmental citizenship other than an environmental studies major. Myers' cautions, however, are also indicated by related research by Bixler and Morris (1997), who compared ten people who did and ten who did not seek out wildland water recreation. They found that those who were dedicated to these sports had had more childhood and adolescent experiences of

wild areas under the mentorship of parents and other relatives, and more membership in outdoor-oriented organizations like the Scouts or summer camp, compared to those who did not seek out such recreation. Those who sought wild water recreation did not, however, have more play experiences in nature as children. In other words, they not only had nature experiences, but also experiences that socialized them into interpreting nature in positive or meaningful ways. Research into the backgrounds of even stronger 'contrast groups', such as young people who show fear, anxiety, and disgust for natural areas (Bixler *et al.*, 1994), may make different processes of socialization clearer.

Environmental Sensitivity Questionnaires

Questionnaires, which can be administered to large samples of diverse groups, are well suited to explore comparisons. Out of three 'environmental sensitivity questionnaires' that have been developed, two have been applied to this purpose.

Similar to Myers, McKnight (1990) created a questionnaire to compare the attitudes and backgrounds of college seniors with different majors: 212 students in environmental studies, engineering, and business. Because she sought to test the assumption 'that personal experiences of nature, especially during childhood, promote positive feelings and attitudes toward the natural environment' (p. 135), her questionnaire items concerned only nature experiences. As would be expected, the environmental studies students were much more likely to report being active on environmental issues than those in other majors. They were also more likely to report that they enjoyed natural areas for solitary play as children (69%, compared with 53% of the engineering students and 40% of the business students), and that they chose hiking or camping as recreation in college (over 80%, compared with about half of the engineering students and one-third of the business students). It is worth noting, however, that a number of students in all majors gave these responses.

A questionnaire by Sia (1984; Sia *et al.*, 1985-86) is particularly important because it has been applied in several comparative studies done under the direction of Hungerford and others at Southern Illinois University. Sia labeled his questionnaire an index of environmental sensitivity and based the items on Peterson's results: involvement in hunting, fishing, or hiking in childhood or adulthood; parents; teachers; and books. He used his questionnaire to make two sets of comparisons: between a sample of Sierra Club members ($n = 105$) and Elderhostel participants ($n = 66$); and between respondents with high and low levels of self-reported environmental actions in each group. For the combined groups, he found that the most significant individual predictors of overt environmental behavior, in order of importance, were perceived skill in using environmental action strategies, level of environmental sensitivity, and knowledge of action strategies (accounting for 49% of the variance). For the elder hostel and Sierra Club samples separately, the first and second ranking predictor, respectively, was level of environmental sensitivity.

Using Sia's questionnaire, Sivek (reported in Sivek & Hungerford, 1989/90) investigated the best predictors of responsible environmental behavior among members of Trout Unlimited ($n = 112$), Ducks Unlimited ($n = 66$), and the Wisconsin Trappers' Association ($n = 103$). Level of environmental sensitivity

ranked among the top three predictors of responsible behavior among members of Trout Unlimited, the Wisconsin Trappers Association, and the collapsed sample of all three organizations.

Sia's (1984) and Sivek and Hungerford's (1989/1990) results suggest that nature experiences, nature books, and positive role models (in other words, the items in their questionnaire) not only characterize, but also distinguish, environmentally active people. It should be noted, however, that the very best predictor of responsible behavior, in all three of Sivek's samples and in Sia's Sierra Club sample, was people's own perceived skill in using environmental action strategies. When Marcinkowski (1987) attempted to replicate Sia's findings among Sierra Club and Audubon Society members, he found that environmental sensitivity scores were generally high, whereas knowledge of action strategies was a salient predictor of greater activism.

A third questionnaire was constructed by Scholl Wilder (1983), who drew upon Tanner's results. Like McKnight (1990) and Sia (1984), she asked respondents to check off childhood experiences—in this case, for the simple purpose of describing the backgrounds of members of the Cincinnati Nature Center and the Miami (Ohio) Chapter of the Sierra Club. In descending order, the influences that respondents checked most often were the outdoors (primarily in connection with daily play, family vacations, and sports), family, habitat alteration, school science or environmental education, teachers, and other adults. Almost all respondents reported that outdoor experiences were 'very positive' or 'positive' (95%) and occurred in small groups of one to five (94%). Her report, however, needs to be read with the reservations that it fails to specify the directions given to respondents, including a definition of 'contact with the outdoors', or the ages included under 'childhood', and even fails to give the number of respondents. (Peters Grant, 1986, mentioned that Scholl Wilder's sample size was 90.) Scholl Wilder also compared urban and suburban respondents and reported no difference in the importance that they attributed to family influences or contact with the outdoors, but she did not explain how suburban and urban were defined.

Environmental Sensitivity: a reformulation

The experiences that people remember as significant in motivating their care and concern for the natural world may be characterized as exchanges between an external and internal environment: an external environment composed of the qualities of physical surroundings, and social mediators of the physical world's meaning; and an internal environment of the child's needs, abilities, emotions, and interests. Almost all of the categories of analysis in the existing research refer to the external environment of natural areas and altered habitats, or social mediators such as friends and relatives, teachers, and books. Very few categories even begin to address the 'silent side' of these experiences, which is the internal environment of the child who receptively responds to these places and people.

In a perceptive autobiographical paper that developed this idea of internal and external environments, Cromwell (1988) explored how her own inner needs and interests led her to a committed environmentalism, while her brothers and sisters responded differently to the same natural surroundings and the same parenting. In future interviews and surveys, and in observations of children's own environmental behavior, more attention needs to be given to articulating

the characteristics of the person who ultimately gives external events their significance. As Myers (1997) noted, the ultimate target of research about significant life experiences is not merely to know the experiences that people have had, but how significance becomes constructed.

This concept of significant life experiences as an exchange between the qualities of the physical world, social mediators, and the responding child implies that constellations of environmental sensitivity change as people, places, and cultural interpretations change—a phenomenon that Palmer and Suggate's (1996) analysis suggests. This complexity is cause for both hope and concern. Contact with natural areas has emerged as one of the most significant influences in all of the studies reviewed; and free encounters with the natural world are becoming inaccessible to more and more young people in an increasingly urbanized world. On the other hand, in the latest research, negative experiences have emerged as new motives for practical concern. One conclusive finding of research on responsible environmental behavior is that there is no single all-potent experience that produces environmentally informed and active citizens, but many together. This complexity may make the challenge of environmental education more difficult, but it also makes it more hopeful. Just as ecosystems are more resilient when they contain an abundance of species that can form diverse adaptations to change, so is the future more hopeful if diverse paths lead people into environmental commitments.

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Notes on Contributor

LOUISE CHAWLA is Associate Professor at Whitney Young College, the interdisciplinary honors program of Kentucky State University. A developmental and environmental psychologist, she has numerous publications on the development of environmental attitudes and action, including a book, *In the First Country of Places* (State University of New York Press, 1994), on the theme of childhood memories of nature. Her current focus is coordinating Growing Up in Cities, an international UNESCO project that engages low-income urban adolescents in evaluating and improving their local communities. *Correspondence*: Whitney Young College, Kentucky State University, Frankfort, KY 40601, USA.

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