

The Development of Children's Concern for the Environment

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Summary

In a first step to construct a model of the development of environmental concern, literature is reviewed regarding children's understanding of environmental processes, their motivations for engagement with the physical world, and their moral development. Political socialization, which bears upon their likelihood of taking action, is also reviewed. Connections between development in these fields and the development of environmental concern are suggested. It is proposed that there are three motivations for environmental concern, with three separate but overlapping paths of development. The direction of development that is desired depends upon either of two opposing visions of the solution to our environmental crisis.

Introduction

This paper is a first stage in the construction of a model of the development of children's concern for the physical environment. In order to fully understand the development of this concern, we consider the routes of knowledge about the environment, the origins of emotional involvement with it, and the conditions under which environmental concern becomes expressed through action. Such a model of the origins of environmental knowledge, emotion, and action will help to suggest ways of improving environmental learning opportunities. The ultimate goal is to improve public participation in decision-making about and caring for environments.

In democratic societies, the public should become aware of the nature of fundamental issues. Unfortunately, in all western industrialized nations, environmental education is treated as a secondary or supplementary subject. No systematic attempt has been made to encourage in a nation's children an understanding of their

responsible place in a complex web of environmental interdependencies. The interactive and integrative teaching required to develop ecological understanding and environmental responsibility is missing from the schools. Fortunately, there is a growing realization of the importance of what might be called "environmental literacy" in the general public.

Any successful long-term program of environmental education must recognize that people vary greatly in their environmental knowledge and values. An education program must therefore be broadly defined. Knowledge about the environment has diverse origins: direct personal contact with physical settings, and a plethora of direct and indirect environmental messages from society. These experiences do not simply provide information; they evoke emotions or convey values. Environmental education, then, is an emotionally evocative, value laden process that it built up in response to every environment encountered, every action toward the environment witnessed and every formal and informal lesson heard. People vary not only in terms of the information to which they have access, but also in terms of their personal histories in engaging with environments, and their resulting sense of self in relation to the environment. Mediating this developmental process is the language and culture of the society to which they belong, with its established political, social, economic, and moral structures – each containing latent environmental values. Environmental learning can only be understood in an integrated way by dealing with all of these processes. This paper explores these processes.

This paper adopts the traditional organization of the psychological literature from which it draws: cognition, motivation, and action. Rarely have these various aspects of human behavior been investigated by psychologists in the integrated manner in which they are found in all of us. The section on cognition reviews major theories and research on children's understanding of the environment. With a few exceptions, this work has failed to consider the motivational aspects of knowing: children's attraction to and spontaneous questions about environments. The roots of such affective relationships to environments are therefore explored in a separate section. Theories of the development of interpersonal morality and their potential relevance to environmental morality are also reviewed.

Finally, because we see a direct relationship between public awareness and the role of education in fostering democratic participation, a further section reviews literature on children's political socialization. The paper concludes with observations regarding trends in environmental learning, and recommendations for environmental education.

Unfortunately, very little of the literature on children's "environmental awareness" has paid attention to the different political, social, and economic contexts of children's lives. In this regard, it should be noted that this paper is limited in con-

ception to children of the western industrial countries. As such, it avoids grappling with the difficult questions of the different conceptions of environments held by other societies.

Conception of the Environment

Remarkably little theory, research or even speculation has arisen concerning the development of children's cognition of physical systems, processes, and environmental problems. The very large amount of research that has been conducted in all countries in environmental education has usually been limited to children's understanding of school curricula drawn from the formal environmental disciplines (largely the natural sciences). Such research has little relevance to this paper's emphasis on children and on the spontaneous questions *they* ask, the structure of their thinking and the development of their concerns for environments. The largest body of research on children's cognition of the physical environment has been conducted by Jean Piaget and his colleagues. Unfortunately, Piaget's most interesting research on this subject, conducted in the 1920's, has not been built upon by others; and his own research has long since removed itself from any concern with children's understanding of real phenomena in its pursuit of a general developmental account of the structure of children's thinking.

In two companion books first published in 1926 and 1927 and a third published in 1937, Piaget summarized his research findings on the development of children's conceptions of the physical world (English editions, 1960a, 1960b and 1954). His findings were replicated with much larger samples by Laurendeau and Pinard in 1962. It is important to note at the outset that Piaget's concern is not with children's ecological understanding, or knowledge of the interacting, interdependent nature of dynamic ecosystems. It is a little ironic that as a biologist Piaget limited himself largely to children's understanding of specific individual phenomena. Nevertheless, his years of careful research have given us the most comprehensive empirically based theory of children's cognition of physical phenomena, and there are a wealth of observations and insights to be culled from his voluminous research reports. A summary of his theory is therefore a useful beginning to this review.

The first question for Piaget in considering a child's conception of the world is whether external reality is as external and objective for a child as it is for us. This problem he calls "realism". As used by Piaget, this word refers to a child's tendency to treat its own perspective as an absolute. It begins with the question: "Can a child distinguish the self from the external world?" Realism is in contrast to objectivity. Objectivity consists of maximizing one's awareness of the countless intru-

sions of the self in everyday thought and of the illusions that result. In marked contrast, realism means ignoring the existence of self and thereby regarding one's own perspective as absolute. The changing boundaries children draw between the physical world and their internal worlds is at the core of Piaget's theory of children's conceptions of all phenomena.

Piaget (1954) describes three complementary processes involved in the evolution of reality between three and eleven years of age (see Fig. 1). The first is the progressive differentiation of self from one's surroundings, such that one can distinguish what comes from oneself and what forms part of the external world as it is observed by everybody. We never achieve complete objectivity of course. There always remain, in different degrees, what Piaget calls "adherences", fragments of internal experience which cling to our conceptions of the external world. They are of five varieties which seem to overlap a great deal. *Participation* is the feeling in a very young child that the world is filled with tendencies and intentions which merge with our own, e.g. - the sun and moon follow us as we walk and the clouds and wind notice us and obey us. Closely related to participation is *animism*, the notion that things such as clouds have consciousness. *Artificialism* is the tendency of a person to think that everything is made for and by people. In *finalism*, there is simple finality without the origins or consequences of an event being noticed, and without objects necessarily being endowed with consciousness. For example, a child says that a river flows so as to go into a lake. The fifth type of adherence is *force*: the notion that things make efforts through some kind of energy equivalent to our own muscular force. All of these five processes are inseparable. Along with them is found the process Piaget terms phenomenistic causality or *phenomenism*.

For a young child, it is credible that anything can produce anything, for as long as two facts appear together in observation they can be interpreted to be causally related. Gradually these processes weaken and a child becomes progressively more capable of constructing an objective conception of the physical environment while at the same time becoming aware of the subjectivity of his or her own world.

Alongside this process of growing objectivity is the second of the three processes of release from realism; the growing reciprocity in a child's point of view with the perspective of others. In the early years of childhood we take our immediate perceptions to be true instead of recognizing the uniqueness of our own perspective. The classic example of this is a young child who thinks the sun and moon are small globes following us just above roof level as we walk along a street. Piaget says we never stop at this age to ask whether these globes also follow other people!

The third process, from realism to relativity, is similar to the previous one. Children begin by thinking of everything as absolute substance and quality and only gradually come to see them as phenomena dependent upon each other and relative

<p>REALISM</p> <p>Self and environment are not distinguished</p>	<p>Progressive differentiation of self and environment</p> <hr/> <p>Decay of "adherence" (i.e. that physical things are all made by man, are conscious, have force and obey us).</p>	<p>GREATER OBJECTIVITY</p> <p>Aware of both an objective and subjective universe</p>
<p>REALISM</p> <p>Own point of view is absolute; reality is what is given immediately</p>	<p>From realism of perception to interpretation</p> <hr/> <p>Child regards own perceptions/dreams as true. Also logical realism i.e. ideas are subject to the law of the moment and only gradually become relative.</p>	<p>GREATER RECIPROACITY</p> <p>Recognizes other points of view; reality is what is common to all points of view.</p>
<p>REALISM</p> <p>Conceives only of absolute substances and qualities</p>	<p>Substances and their qualities become more and more dependent upon each other and relative to us.</p> <hr/> <p>A growing relativity of ideas in relation to the self and one's evaluations.</p>	<p>GREATER RELATIVITY</p> <p>Conceives of a universe of relations.</p>

Figure 1: A Child's Construction of Reality (Constructed from Piaget, 1926, 1927, 1937).

to us. The clouds, for example, are first thought to move by themselves; and even when children become aware that clouds move with the wind, they believe for a while that they maintain their own energy and direct themselves. Subsequently, they come to realize the external forces determining the motion of natural objects - in this case the wind - and that these are in turn dependent upon other external forces, until they recognize the existence of a universe of relations. Alongside this growing relativity of children's understanding of physical substances and qualities is a growing conception that their own ideas are relative to themselves and to their personal evaluations of things. As such, this advance towards relativity converges with the previously described advance towards reciprocity of points of view.

Similar to Piaget's account of children's developing conception of reality is his account of their developing understanding of physical causality (Piaget, 1960b). In both cases, children begin by confusing the self and the external world by recognizing only their personal point of view, and move toward greater objectivity, reciprocity, and relativity.

Piaget's theory of development has come under growing criticism. Central to this criticism is the charge first made by the Soviet developmental psychologist Vygotsky that the developmental uniformities Piaget found amongst his Swiss children are not laws of nature but are "historically and socially determined" (Vygotsky, 1979). Extensive work among children around the world has demonstrated that cognitive development is influenced by the materials experienced, and the cultural situations in which they are interpreted. The fact that a cognitive skill may manifest itself at different ages in the same child, depending on the materials involved and the task, has called Piaget's conception of the existence of stages in development into question. However, the misinterpretations of reality that Piaget first described have been repeatedly found. Piaget first revealed, as he has termed it, that young children are "both nearer to and farther from the world of objects than we are" (1960b, p. 254).

They are nearer to the world through a "fidelity to fact", a tendency to accept the world as it is given in observation. They are also nearer to it through a projection of their own feelings and abilities on to it. At the same time, these tendencies create the confusions that distance them from the world of objects in which adults live.

A rare example of a longitudinal study of developing conceptions of reality and causality suggests an alternative theory of cognitive organization to Piaget's theory of stages. Navarra and his wife (1955) kept detailed records, in both narrative and photographs, of their son's development of scientific concepts between the ages of three and five.

Although in many ways agreeing with Piaget, Navarra was not able to observe distinct stages of conceptual development. He stresses instead that his son's growth seemed to be organized around the arousal of concerns, or incompletely understood *interests*, which became threads upon which otherwise isolated experiences were bound together into larger, interlocking patterns of understanding.

Although not explicitly stated as a theme in the book, a number of records which Navarra used as examples illustrate a major issue in the development of environmental knowledge: a child's frequent dependence on second-hand information. The operation of many features of environmental systems is hidden. This issue has been highlighted in another study. Kates and Katz (1977) were concerned with children's understanding of the geographic environment. Four, five, and six-year-old children in Worcester, Massachusetts were observed and interviewed about their understanding of the hydrologic cycle. They made the observation that these children commonly constructed two separate unlinked cycles: a domestic water cycle and a cloud-rain or natural cycle. None of them seemed to be able to spontaneously make the connection between rain and water sources. We may hypothesize

that the children had difficulty linking the two systems for the very good reason that the natural hydrologic cycle is not easily observable. The rain percolating gradually to form rivers, ponds, lakes and reservoirs, and thence into homes, is too gradual a process, at too large a scale, for children to observe. Clearly such learning depends more on the availability of information than upon intellectual development.

The discovery of hidden processes is probably a crucial factor in the development of children's understanding of environmental systems, particularly in urban settings. In an exploratory study of children's understanding of energy systems, we noted that access to environmental experiences, such as seeing fuel trucks filling tanks beneath an apartment building, had an important impact on children's understanding. A few good educational advisors have realized this problem. Sprague Mitchell wrote about ways of recognizing it in her classic insightful book *Young Geographers* (1934). But it has not been taken into consideration in developmental research or by contemporary environmental education advisors.

The more that children are insulated from direct contact with both natural and man-made systems, the greater the influence assumed by teaching by parents, peers, media, and environmental education programs in school. We hypothesize that the kinds of verbal information children are currently given tend to reinforce only two of the three motives for environmental concern: self-preservation and interpersonal preservation. Messages regarding environmental problems are usually presented in the context of a threat to human life or health.

In light of the manifold misconceptions in children's interpretation of the physical world that Piaget has described, it is unlikely that pre-adolescents can understand complex ecosystems. But it may be that higher levels of intellectual ability are not the crucial factor in the development of children's ecological understanding, for cognition is built from experiences. If children's experiences are solely with the world of people, it is unlikely that they will develop ecological understanding. The decentering, i.e., progressive relativisation of perspectives, which Piaget and colleagues stress so much, needs to be extended to the nonhuman world, to achieve ecological understanding. Something like an affective transference to the other organisms or elements of the biotic environment is required. Such "environmental perspective-taking" is probably much more useful than attempting to accelerate the verbal understanding of abstract ecological concepts. In this way, children may be able to intuitively grasp ecological concepts years before they are able to fully articulate them.

Of all environmental experiences which might be valuable to the development of children's environmental perspective-taking abilities, interactions with animals are probably supreme. Susan Isaacs (1930) concludes from her detailed observa-

Are
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tions of children's biological interests that children "are on the whole more actively and spontaneously interested in animals than in plants" (p. 170). She suggests that "the empathy which a young child feels with the living, moving, responsible animal" is the starting point of biological interest. Animals seem particularly able to communicate their needs and even feelings and so children can begin to enter a little into their "life world" (Von Uexküll, 1957). Isaacs notes that plants are often seen as "little more than gifts and decorations". While this is true, it need not be so, for devoted gardeners often speak of "reading" the needs and some say even the feelings of their plants. Whichever of these experiences are predominant for a child, we hypothesize that biological experiences form a most important basis for the development of an environmental ethic.

The Development of Environmental Interests and Concerns.

It is not enough to only ask, like Piaget, *how* children conceive of phenomena in their world. We must also ask *why* children ask such questions and what importance this information holds for them. By approaching these motivational questions, we may move towards an understanding of the factors which lead some children to be interested in and concerned for the environment and others to be alienated from it.

Theories of Human Motivation

The best known theory regarding curiosity and exploratory behavior is that of Daniel Berlyne (1960). According to Berlyne, infants and children explore their surroundings either to acquire information about uncertainties in a situation, or as an "epistemic response" - that is, in order to gain knowledge useful for guiding future behavior. At the same time there is the anxiety reducing or protective function of exploration through which an individual wishes to surround the self with a known and predictable world. While these are undoubtedly important motivations, there must be something more than purely functional explanations for human relatedness to the environment.

For speculations regarding a developmental sequence of motivations for environmental learning and relatedness, we must turn to psychoanalytic theory. Harold Searles (1960), a psychiatrist who has directed his attention specifically to an examination of the role of the physical environment in development, has concluded that the physical world:

"...far from being of little or no account to human personality development, constitutes one of the most basically important ingredients of human existence". (p. 5).

When the work of Searles is combined with the work of Abraham Maslow (1954, 1962) and particularly that of Erik Erikson (1950), whose theories suggest points at which different motivations for seeking coherence in environment predominate, a sequence of changing needs and concerns is suggested.

Erikson's age-related sequence of eight crises in the growth of personality suggests points at which the hierarchical set of needs described by Maslow, and the observations by Searles, might fit into a developmental model. Some crises in Erikson's model are almost exclusively social, but when those stages of the life cycle which imply environmental needs are traced, a sequence of four major motivations for environmental relatedness emerge. They are: safety and security, companionship, competence, and the existential urge to define one's self through the environment.

In infancy, the physical environment is crucial to achieving a world view of basic trust versus basic mistrust. For the newborn, physiological needs have primary importance. The assurance of a nourishing, comforting physical environment is necessary for psychological health as well as physical health. As a baby's awareness of the environment grows, safety needs (the second in Maslow's hierarchy) become an important component of trust. The spatial aspect of environmental learning, whereby one constructs mental representations of one's surroundings, begins at this time. A world in which things remain predictably in their place can offer a sense of security, stability, and order.

As the baby becomes mobile, first crawling and then walking, the crisis faced is one of autonomy versus shame and doubt. At this point, the parent's confidence that the baby does not need to be protected from the environment, or that the environment does not need to be protected from the baby, assumes central significance. This confidence makes the difference between allowing the child autonomous explorations of the environment, or frustrating autonomy through punishments and prohibitions.

Extending from this toddler age into school age is another type of environmental relatedness, which Searles has described: non-human objects as a source of companionship. Searles argues that to a significant extent a child's belonging needs can be satisfied by the non-human environment. In young children, a favorite toy can offer comfort and sympathy, can serve as a tool to play out desires and tensions, and can reflect to the child his or her own capacity for tenderness or cruelty. In the middle years of childhood the same elements can be found in attachment to a favorite pet, or even a favorite place.

In the middle years of childhood, interaction with the physical environment becomes a profound part of the process of self definition. Erikson defines this age as a crisis of industry versus inferiority. Esteem needs must be fulfilled at this time, and the means for self-actualization are prepared. Environmental competence is

crucial to a sense of industry and self-esteem. It may be defined as the knowledge, skills, and confidence to use the environment to satisfy one's own goals, in accordance with the goals of one's society. The development of competence requires both responsiveness from the side of the environment, and responsibility from the side of the child. The environment must be responsive in offering opportunities to exercise all of one's physical skills, to see a range of outcomes as the result of one's environmental manipulations, and to travel and discover environmental resources. It also needs to provide opportunities for the child to assume responsibility by caring for other living things or by managing some meaningful part of the functional daily tasks of adults.

In considering the strength of a child's urge to know the physical world, it may be necessary to postulate *existential needs*: the needs an individual has to know why he or she is alive and what is the meaning of life. Friedrich Froebel (1826), the nineteenth century educational philosopher, perceived this urge in children's struggles to understand their place in the universe in relation to all other life, human or otherwise. He describes this urge in the stage of "boyhood" (today recognized to include girlhood):

"It is not alone the desire to try and use his power that prompts the boy at this age to seek adventure high and low, far and wide. It is particularly the peculiarity and need of his unfolding innermost life, the desire to control the diversity of things, to see individual things in their connection with a whole, especially to bring near that which is remote, to comprehend (the outer world) in its extent, its diversity, its integrity; it is the desire to extend his scope step by step" (p. 103).

The sense of competence developed in childhood becomes central to success in adulthood. Erikson terms mature adulthood a crisis of generativity versus stagnation. Through generativity, the need for self-actualization can be fulfilled. Generativity requires a caring commitment to the world. Efforts to preserve or restore environmental quality are one form that this commitment may take. They may be motivated by a sense of social responsibility or a sense of environmental responsibility. It can be hypothesized that environmental responsibility that manifests itself now has its roots in a relatedness to the environment in childhood.

Old age is a crisis of ego integrity versus despair. In the face of death, the existential urge to define "one's place in the world" must take final shape. Maslow believes that at this point human life must be seen in a context that is "transpersonal, transhuman, centered in the cosmos, rather than in human needs and interest" (1968, iii). Rachel Carson (1956), when she was herself approaching old age, asserted that rich experiences of the physical world, combined with reverence for it, prepare one to face this stage with composure.

Theories of Moral Development

Although research on children's moral development has been concerned with questions of social responsibility, processes analogous to the development of social morality may occur in the development of an environmental morality. Also, as explained in the introduction, it appears likely that traditional principles of interpersonal morality motivate most environmental activism.

The best empirically tested theory of moral development is that of Lawrence Kohlberg (1958, 1964, 1969, 1973). It grows out of Jean Piaget's (1932) work on moral development, but it is considered to be more refined and comprehensive than this very early research by Piaget. From longitudinal interviews with boys and young men, Kohlberg defined a set of six stages, which, like Piaget, he has claimed to be universal and invariant. Also, like Piaget, he is currently being challenged regarding his stages' universality, invariance, and very existence (reviews by Kurtines and Grieff, 1974; Hoffmann, 1979). Whatever the outcome of this controversy, his contribution must be acknowledged in revealing that mature levels of moral reasoning are the end-point of a long, easily arrested, process of development. Kohlberg rarely found examples of "principled" reasoning before early adulthood, and he found that most adults reason on a "conventional" level.

Of particular interest to this paper are the processes by which people move through these stages. Kohlberg describes two processes: cognitive disequilibrium and role-taking. The first, cognitive disequilibrium, is an extension of Piaget's theory of intellectual development. The hypothesis is that moral growth results from exposure to levels of moral reasoning that are "higher" than one's current level of reasoning. It is the disequilibrium (experienced as conflict) which leads the person to be motivated to think about his or her own moral reasoning. The second process, role-taking ability, or the ability to take another person's perspective on an issue, is similar to the growing reciprocity in points of view that Piaget describes as a means by which a child moves beyond realism.

From the point of view of an environmentalist, Kohlberg's model can be faulted as exclusively anthropocentric. In one paper, however, Kohlberg (1973) has allowed himself to speculate about moral development and more general personality development, and about a morality that transcends exclusively human relationships. In this paper, in light of his most recent longitudinal data, and in an effort to integrate his model with the model of personality development of Erik Erikson (1950), he has reconsidered some of his original conclusions. It is his revised conclusion that personal experiences of choice involving committed action are required to stimulate the cognitive-moral reflection that moves a person from conventional to prin-

cipled thought. In other words, advanced moral development depends upon behavioral commitment, not just abstract logic. Kohlberg also hypothesizes a Stage Seven, whose "essential is the sense of being a part of the whole of life and the adoption of a cosmic, as opposed to a universal humanistic (Stage Six) perspective" (1973, p. 55). He can only speculate about this stage because he has not yet encountered it in his longitudinal sample, who had only reached 28 at the time of their last interviewing. It is a stage that Kohlberg associates with full maturity, with the problem of securing a sense of integrity against a sense of despair, in Erikson's terms. If Kohlberg added to his model the fluidity of Erikson's model of epigenesis, in which the seeds of a later mode of life and thought are contained in early development, then this seventh stage could have relevance for the development of an environmental morality in children as well as in mature adults.

Because Kohlberg's work has been principally concerned with moral logic, rather than feelings, his theory has little to suggest regarding the affective component which motivates children's moral concerns. For insight here, we must turn to a more recent hypothesis concerning the development of empathy and sympathy in children.

Martin Hoffman has developed his theory by considering people's modes of empathic arousal in the light of developmental theory of a child's cognitive sense of "the other" (Hoffman, 1976). Examples of empathic arousal are the crying response to someone else's crying (common to infants), or the association of one's own experience of past pain or pleasure with signs of pain or pleasure in someone else. The most sophisticated mode of empathy, of course, is imagining how it would feel if the stimuli impinging on someone else were impinging on oneself. By integrating these affective trends in children with children's cognition of others, Hoffman was able to conceptualize the four levels of empathic distress response summarized in Figure 2.

A central hypothesis of Hoffman's theory is that mature levels of empathy and sympathy are made possible by an initial confusion between the self and the external world. Young children give signs that what they experience is a conditioned response based on the similarity between behavioral cues of another and their own experiences in the past. They only gradually differentiate between the experiences of the self and another. Hoffman stresses that this in-between period of gradual differentiation forms the link between empathy or feeling *with* the other, and sympathy or feeling *for* the other. If the child suddenly realized that the self and the other were entirely distinct, the reaction might simply be relief that the self is not affected. Thus empathy alone develops into a combination of empathy and sympathy: affectively feeling with the other and cognitively feeling for the other.

0 years	<p>I: <i>Global undifferentiated empathy</i> Global empathic response – does not differentiate whether it is from the self, come other person or from the situation</p>
1 year	<p>II: <i>Egocentric empathy</i> Aware of other person's separateness from self, and so capable of empathic response. Confuses self with other's inner states (i. e. feelings)</p>
2/3 years	<p>III: <i>Situational empathy</i> Aware that others' thoughts and feelings are different from one's own and increasingly becomes capable of empathy aroused by imagining oneself in the other's situation.</p>
10 – 14 years	<p>IV: <i>Wholistic empathy</i> Conceives of other persons' feelings not only in particular situations but also in context of their history and pattern of life experiences. Therefore can now respond with empathy to a representation of their general condition i. e. opportunities, future hopes, injustices etc.</p> <p>V: <i>Social responsibility</i> Generalized empathic distress capability: Comprehends the plight of an entire group or class of people</p> <p><i>Ecological responsibility: (our addition)</i> Concern for maintaining ecological integrity of earth: involving a concern for future generations of people and their interdependent survival with all life on earth.</p>

Figure 2: Levels of Empathic Distress Response (Modified from Hoffman, 1979).

Clearly for people to behave toward all life, human and non-human, present and future, in an ecologically responsible manner, they must achieve the highest level of empathy. But Hoffman's model seems to stop short of the highest levels we can expect people to achieve. Hoffman seems to suggest that there may be a fifth level in which "with further cognitive development the person may be able to comprehend the plight not only of an individual but also of an entire group or class of people" (Hoffman, 1979, p. 31). This level has been added to the summary of his theory in Figure 2.

But surely there is another level for, if the large environmental movement in the Western democratic nations has a single most important message, it is that the public's consciousness of the environment requires a qualitative change. Further thought and research are needed to reveal whether or not there are any qualitative

differences in the cognition and empathy required for the fifth level of "social responsibility", and the cognition and empathy required for this suggested level of "ecological responsibility", and, if so, what the processes are by which an individual arrives at an ecological level of concern.

At this point, it is possible to review a few records of children's environmental concerns, and to speculate upon the development of an environmental morality in light of the interpersonal moral development literature, reviewed above. Because Kohlberg has drawn heavily upon Piaget's cognitive developmental theory, remarks made earlier in connection with the development of environmental knowledge also apply to the development of environmental concern. Because most contemporary Western children have little direct experience with living things or with complete chains of physical systems, it is to be expected that the development of environmental concern, like the development of environmental knowledge, would be especially dependent upon second-hand information passed on by adults, playmates, and media. There is no immediate negative or positive feedback, in the form of punishment or praise, in the physical world. There are also less opportunities for cognitive disequilibrium and role-taking, the basis of Kohlberg's model, in the physical world than in the social world.

Even when one considers environmental behavior strictly in terms of social responsibility rather than ecological responsibility, it is more difficult for children to achieve high levels of responsible behavior in this area than in other areas of social responsibility. No one person has responsibility for the environment, and it is difficult to see the consequences of one's acts.

In the realm of environmental morality, a distinction must be drawn between cognitive disequilibrium and cognitive confusion. Social psychology has shown that it is perfectly possible for people to hold conflicting beliefs, as long as the areas of conflict are not highlighted (Abelson et. al, 1968). A naturalistic study by Susan Isaacs (1930), in which she made detailed records of the development of biological interests in a school population of four to ten-year old children over a three-year period, illustrates how pervasive confusion in environmental morality can be.

Having noted that children are very interested in animals, Isaacs goes on to explain that when adults teach about animals, they have rigid ideas concerning which facts children should learn. She argues that there is probably no moral field in which children see so many inconsistencies between what they are told and the way adults behave. Here is her summary of the varying standards with which any child in an ordinary environment comes in contact:

- (1) We (the majority of us) eat dead animals and a child early realizes that the "meat" eaten at the table is from animals killed for this purpose.
- (2) We kill for our own safety, e.g. stories of fierce animals such as bears and lions,

observations of people killing wasps.

(3) We kill animals which are a nuisance, e.g. garden pests.

(4) Many adults kill for sport.

(5) Many of us wear animal skins for clothing.

(6) We keep animals which are themselves "cruel", e.g. cats which torture and kill mice.

(7) We communicate curious phobias about particular creatures - spiders, mice, snakes and other "creepy and crawly" things.

(8) Some of us kill for collecting purposes.

In addition to these modes of behavior, which are in contradiction to our explicit teaching against cruelty of any kind in children, there are the following very disparate types of behavior by adults:

(9) Poems, often sentimental about all kinds of animals.

(10) Utilitarianism, e.g. breeding cows and horses.

(11) Pet keeping.

(12) The study of birds and animals as a pastime, without disturbing them.

(13) Experimental studies on living or dead animals.

One important contemporary addition to Isaacs' list of sources of information are some ecological films and children's books. However, these are so outweighed in number by nature books and films of a romantic, sentimental bent that their positive effect is probably drowned. Isaacs points out that, in the face of this confusion, all that children are usually told by adults is to "always be kind". Inconsistencies alone should not be of concern, because they are central to reflection leading to the formulation of one's own values. However, just as in the development of environmental knowledge, animals have little opportunity to press their case and to correct misconceptions regarding their behavior or the impact of human actions on their lives.

One of us has observed the effect of incomplete understanding in creating an unrealistic environmental ethic in a small, urbanizing New England town (Hart, 1979). While walking through the woods and fields with mixed groups of nine to eleven-year-old farm children, local Vermont-born children, and "immigrant" suburban children from Connecticut, Massachusetts and New York State, one observed distinctly different behaviors based on clearly stated values. The immigrant children from middle class families who had grown up on suburban housing estates had an excessive "don't touch" ethic, which extended to scolding the farm children when they broke any branches of trees or collected any insects. When questioned, these children revealed that a rather extreme conservation ethic had been assimilated. This, together with a very limited ecological understanding of the natural environment, was at the root of their behaviors. In contrast, the farm children had under-

standably utilitarian values toward plant and animal life, but these lay within the context of a somewhat more balanced understanding of natural systems and processes, such as the ability of plant life to regenerate itself when mildly damaged.

Intimate contact with the environment alone will not, of course, lead to responsibility toward it. We may hypothesize that another important process of moral development – modeling and imitation – is required to transform environmental experiences into a respectful, non-exploitative mode. Bandura and Walters (1963) have introduced a multitude of studies which have demonstrated the powerful influence of modeling on behavior. It is hypothesized here that, because of the limited opportunities for environmental feedback that have been discussed, modeling and imitation, along with verbal learning, assume particular significance in shaping environmental behavior.

The significance of modeling was suggested to one of us by an experience with a daughter. When the child was not quite two, she was walking with a grandparent when a large ant darted across their path. The grandparent immediately stomped on the ant. From that time on, despite pleadings and persuasions from her parents to the contrary, the child stomped on every ant that she saw. It was not until she and a parent respectfully went down on their knees together to spend a long time watching the construction of an ant mound that she left ants alone. Similarly, Susan Isaacs found that when children were exposed to death in animals in an uncritical way, rather than “protected” from such experiences, their “minds turned more freely and steadily towards the non-interfering observational attitude of many modern naturalists towards living animals in their own setting” (Isaacs, 1930, p. 166).

Speculations can also be made regarding the relevance of literature on the development of empathy and sympathy to the development of environmental concern. Both in Piaget's theory regarding the conception of physical systems and in Hoffman's theory regarding empathy, development can be seen as a process of original confusions between the self and the world, followed by increasing differentiation, toward an ideal goal of a mature sense of interrelatedness of self and world once again. A similar progression of fusion, differentiation, and re-integration may underlie the development of environmental concern.

As long as the end-point of development is conceived to be an abstract logic of scientific or moral reasoning, the young child's initial confusion between self and the world or self and other must be seen as an immaturity to be outgrown. If ecological responsibility is adopted as a goal, however, then the value of these early modes of thought and feeling needs to be reconsidered. Just as Hoffmann has hypothesized that an initial lack of differentiation of self and the other is the origin of empathy and sympathy, so an initial lack of differentiation of self and the world may be the origin of environmental concern.

Parallels can be drawn between some manifestations of animism and environmental concern. Piaget has noted that animism sometimes assumes the form of reverence for things. He gives examples collected by Sully in his book *Studies of Childhood*:

"One of us recalls having set herself the following obligation as a child. If by chance she displaced a stone that had been partially buried in the ground, she put it back in its place so that it should not suffer from having been moved. Or again, if she brought home a flower, or a pebble, she always brought several flowers or pebbles at the same time so that they should have company and not feel lonely.

Another felt compelled, on the other hand, to move stones from the path now and then so that they wouldn't always have exactly the same view to look at" (Sully, no date, referred to in Piaget, 1960a, pp. 208-9).

Navarra (1955), in his records of his son's developing environmental concepts, found that the child's first expressions of concern for animals' well-being could be related to a projection of his own needs, abilities, and feelings into them.

By emphasizing human distinctness and domination over the environment, Western thought has taken a different direction than Eastern thought. In the philosophies of Hinduism and Buddhism, it is believed that everything is made of the same divine energy, and the intellect is mistaken in drawing distinctions such as animate and inanimate. It is also believed that the self cannot be defined in isolation from the environment, because the self and the environment are one interwoven web of life. Paradoxically, it is those who embody the most advanced achievement of Western scientific thought who are spreading the same message, in their own terms. Ecologists see a world in which all things are open systems, constantly exchanging atoms and energy. One wonders also how real the distinction between animate and inanimate appears to a physicist considering the atomic dance of a metal, a liquid, or a leaf. Fritjof Capra (1977), physicist, has detailed the similarities between Eastern philosophy and a physicist's world view. Childhood animism may need, not erasure, but evolution.

In concluding this section, it is proposed that manifestations of environmental morality, like manifestations of social morality, can be expected to a degree concurrent with experience and involvement. For most of us, morality is an occasional dilemma in our lives. For some people, it is their life work, as their life is taken up in their response to injustice or human need. Not surprisingly, some of the most fervent expressions of an environmental ethic have been made by natural scientists. In this context, it may be important to remember the statement by Condoret, a veterinarian, in his book regarding children's attachment to animals. He hypothesized that a strong relationship to animals formed during pre-adolescence is the basis of the occupational choices of foresters, natural scientists, and veterinari-

ans, and cautions against contemporary city life that deprives children of contact with the natural world, often even in the form of pets. He argues that a relationship to animals formed in childhood has important consequences for subsequent treatment of them:

"One protects only what one loves. And to love is to know. How can one love what one does not know, or has never known?" (Condoret, 1973; personal translation from the French)

The Development of Children's Understanding of Politics, Environmental Decision-Making, and Democratic Participation

The literature on children's "political awareness" and "political socialization" yields little of relevance to this paper. It limits consideration of political understanding and values almost entirely to party preference, party leaders and to politics at a distance (e.g. Connell 1971; reviews by Hess and Torney, 1968; Niemi and Sobieszek, 1977). Not surprisingly, children know very little about the distant or central government issues, and what they do know and value is a close reflection of adult society, for they have no experience with these systems as they do with their home, school, church, etc. It is a remarkable reflection of adults' understanding of democracy that they should not see children's local experiences as related to society on the large scale. They do not appear to believe that political process is something which we are, and should be, involved in in our everyday world.

Fortunately, there are a few authors and researchers who have seen the importance of investigating the relationship between participation by children in all types of social settings and their "political" socialization. For example, Almond and Verba (1965) examined the relative effects of participation in decision-making in the family, the school and at work on "feelings of political competence". They found that "the connection becomes stronger as one moves from family to school to job participation" (pp. 303-304). Unfortunately, this is so rare a study that the generalizability of the conclusions reached by the authors is moot.

Many authors agree on the importance of early childhood experience in the formation of political attitudes, but their evidence is mainly that of correlations between parents and children on such issues as political party preference and identification (Campbell et al, 1954, Dowson, 1966; Jennings and Niemi, 1968). Not only is this a narrow conception of "political", but the assumption that the stated political preferences of children reveal enduring attitudes is difficult to accept. The studies themselves have found a low stability in children's response and a tendency to change dramatically, while "attitude" is usually taken to refer to the "more enduring, persistent organization of predispositions" (Rokeach, 1960, Ch. 2).

Renshon (1975), by contrast, has taken a deeper look at the issue by arguing the importance of personality development. He hypothesizes that basic beliefs about the nature of the world arise out of a child's desire to satisfy basic needs. (He adopts Maslow's five levels). Taking the example of the belief in personal control that arises out of Maslow's first two needs, he investigated, through interviews and questionnaires, the influence of home and school contexts. His data confirmed that the family is the most important context in which personal control is learnt and that the level of parents' personal control beliefs, degree of autonomy allowed, and degree of rule enforcement consistency are very important factors, but more important than these specific findings is the demonstration that it is possible to investigate the impact of some of the different dimensions of family life instead of treating it as a "black box", as it usually is in correlational attitude studies. This research endeavor promises to be most valuable to our understanding of the development of children's environmental concerns, particularly as it begins to discover how, and at what ages if any, the belief sets become fixed, as Renshon claims they do. We hope to see similar research conducted in the school context, again looking at children's political beliefs in relation to the ideology inherent in the way the school itself is run, rather than correlating children's political attitudes with whether or not they have taken a civic course (e.g. Niemi and Sobieszek, 1977).

One conclusion in a recent review of the political socialization research literature of particular relevance to the question of children's ecological concerns is that even elementary-aged school children react to political events and do not passively absorb attitudes from parents and others (Niemi and Sobieszek, 1977). Accurately sorting out the relative impacts of age, generation and "period" effects (i.e. events having an impact on all age groups) is difficult, of course, and requires longitudinal cohort analysis type research designs. With such tools, we can investigate, for example, whether or not the environmental movement of the 1970's in the Western World created a kind of "Environmental Generation" of more ecologically-minded persons.

One of the most important questions in developing a model of the roots of environmental concern is what is the impact of socio-economic differences. Robert Coles (1975a) movingly describes, through children's own words, how people seemingly become less conscious of issues as they come to feel powerless. In Coles' example, it is children of Southern black sharecroppers who seemed to retreat from awareness of national issues because of their developing awareness of powerlessness. The same would be true of any group feeling trapped at the bottom of a socioeconomic ladder. We may hypothesize that people who sense that they are themselves exploited will be less likely to develop a non-exploitative relationship with the environment.

Coles' approach of open-ended discussions with children reveals that there is much more to political socialization than simply school, parents and television. He describes how children and their peers may learn to see through many of the fabrications our society has developed but that it is often to no avail:

"...Children ingeniously use every scrap of emotional life available to them as they develop "psychosexually", and they do likewise as they try to figure how (and for whom) the world works. A friend's remarks, a classmate's comments, a statement heard on television can give a child surprising moral perspective and distance on himself and his heritage - though, of course, he is not necessarily thereby "liberated" from the (often countervailing) day-to-day realities of, say class and race..." (Coles, 1975b, p. 16)

Observations such as these reveal that the development of children's political awareness is a complicated issue and needs to be pursued with research methods which do not obscure this complexity. The same is true of the related issue of the development of environmental concerns. We need to begin with rich accounts of individual children instead of a total emphasis upon the large-scale correlational studies of environmental attitudes which compose the mass of the current literature.

Conclusions

Each of the three preceding sections of this paper has dealt with a different component of environmental concern. There are important trends in contemporary life which bear upon each of these components. The point has been made in this paper that the difficulty of obtaining a good understanding of environmental systems is probably a major factor in limiting the development of an ecological ethic. Even in the operation of day-to-day physical systems, some steps are too well hidden, or too microscale or macroscale, to perceive with human senses. Paradoxically, knowledge about the environment is changing in two opposite directions today. On the one hand, technology has enabled us to extend our human senses so that it is possible to perceive the complexities of environmental response to human action. The media can immediately communicate these perceptions to others. On the other hand, more people live more of their lives isolated from direct interactive encounters with a broad spectrum of environments. In both work and daily life, we are more confined to the experiences of a specialized, narrow band of physical processes. The natural environment is more rare and distant, and access to a diverse urban environment is more restricted by crime, traffic, and spatial segregation of uses. Opportunities for human sensory experience of the environment are decreasing.

The first trend, toward more sophisticated knowledge and its rapid communication, has increased a consciousness of environmental problems among individuals and among nations. It may have benefitted the development of abstract environmental knowledge and political concern. It can be hypothesized that the second trend, however, toward more restricted encounters with the environment, reduces opportunities to develop a deep sense of self/environment relationship. Many psychologists have demonstrated that children learn best not what they are told, but what they actively experience for themselves and make their own through autonomous use. This paper has suggested that such a rich, satisfying "personal knowing" may underlie real ecological responsibility.

The paradox of greater abstract knowledge concurrent with narrower personal knowledge is reflected in a major debate in the area of environmental policy. Many people, and governments, believe that we have only to encourage new technological breakthroughs to see the solution of our environmental problems. Other people argue that only acceptance of our place in an interdependent network of living and nonliving things followed by a change in our behavior, can solve our problems (for example, Ehrlich and Holdren, 1971; Disch, 1970; Roszak 1979; Grossinger, 1978). These two different positions imply two different developmental goals and two different educational philosophies. If we expect children to be living in a decentralized participatory democracy with less dependence upon foreign resources, we might stress such qualities as resourcefulness, problem solving ability, critical reflectiveness, flexibility to change, skills of cooperation, social and environmental competence, and social and ecological responsibility. If, however, we expect children to enter a more technocratic, centralized, less participatory society, we might stress the kinds of behavioral priorities currently being encouraged in the schools of Western Europe and the United States with their great emphasis upon abstract thinking and theory divorced from practice.

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Zusammenfassung

In einem ersten Versuch eines Modelles zur Entwicklung von affektivem Umweltbewußtsein (environmental concern) wird ein Überblick der Literatur zu folgenden Themen erstellt:

Das Verständnis der Kinder von ökologischen Prozessen, ihre Motivation zum Engagement in der physischen Umwelt und ihre moralische Entwicklung. Die politische Sozialisierung, die auch die Wahrscheinlichkeit des Handelns beeinflusst, wird ebenfalls aufgearbeitet. Zusammenhänge zwischen den Entwicklungen in diesen Bereichen und der Entwicklung des affektiven Umweltbewußtseins werden vorgeschlagen.

Drei Motivationen zum Umweltbewußtsein werden nahegelegt, die getrennte, aber sich teilweise überschneidende Entwicklungspfade aufzeigen. Die erwünschte Entwicklung hängt von der Auswahl zwischen zwei konkurrierenden Auffassungen zur Lösung unserer Umweltkrise ab.

Incessis