

Chapter 6

Participation and the Ecology of Environmental Awareness and Action

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6.1 Introduction

This chapter takes up two questions essential to participatory environmental education: *What experiences prepare children to be aware of their environment and to take action on its behalf? And, how can communities support children's environmental learning and action?* I suggest answers to these questions based on an ecological approach to psychology and show how research on the significant life experiences of people committed to environmental education and action can be understood within this framework. I also argue that environmental education can most productively encourage children to know, value, and protect the diversity of life on this planet if it builds on a theoretical foundation that embeds human development in an ecological context.

6.2 Learning to see and Learning to Take Action

Growing up to know and value the diversity of life is partly a matter of *learning to see*: learning to see communities of plants and animals, details of their individual existence and interactions, and patterns of their ever-changing habitats. In cities and towns it includes learning to see the diversity of human communities and the ways in which people interact with their place. As the wildlife biologist Aldo Leopold observed many years ago, environmental education faces a great challenge, 'how to bring about a striving for harmony with land among people, many of whom have forgotten there is any such thing as land, among whom education and culture have

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become almost synonymous with landlessness' (Leopold 1949, 1966:210). Therefore this chapter begins with a discussion of theories of perception.

Yet, learning to see brings risks as well as fascination and delight. What if a person sees painful things? As Leopold (1949, 1966:197) also observed, 'one of the penalties of an ecological education is that one lives alone in a world of wounds.' He compared attentiveness to the land, in the midst of a culture that is largely oblivious to the effects of its actions on other forms of life, to the condition of 'the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise' (ibid.). Therefore, learning to see needs to be balanced by *learning to take action* on the environment's behalf – learning that one is not, in fact, alone, learning how to organise and collaborate with others in order to investigate the sources of problems, and learning how to build a common vision for a better world and take steps to bring it to reality. This goal is comparable to the concept of *action competence* that has been defined by Jensen and Schnack (1997) and Breiting and Mogensen (1999). It is the theme of the second half of this chapter.

For both learning to see and learning to take action, participation in the life of one's community is essential – where 'community' is meant in an expansive sense of the plants and animals as well as the people and cultures of one's locality. To maintain this broad meaning, this chapter is equally concerned with formal and informal participation. Informal participation involves freedom to move about and explore natural and built environments, to gather with others and to observe and try out roles in public places. Children cannot see the diversity of life unless they have a chance to venture out into it. By getting out, they come to find out about issues taken up in formal channels for participation, like the loss of habitat or homelessness. Thus formal and informal participation are two interdependent sides of the inclusion of children in their communities. Through freedom to move about in their localities and become part of diverse settings, children gain authority to speak about the conditions that they find. They also gain reasons to become involved. If they have benefited from open and accessible communities with a variety of resources, they are likely to defend these advantages. If they live in places that are boring or dangerous, but they have had opportunities to see alternatives, they are likely to advocate a more generous plan (see, for example, Chapter 18 by Barratt and Barratt Hacking, this volume).

One advantage of ecological psychology for environmental education is that it directs attention to the importance of informal as well as formal learning. In doing so it accommodates the learning of very young children, from infancy up, who primarily know their communities through the informal contexts of everyday life. Typically, when formal mechanisms for participatory planning involve young people they focus on pre-adolescents and adolescents. Younger children, however, often have thoughtful views as well. Even before they learn to talk, their disposition to engage with the world and to make their mark – a disposition essential for community participation – is rooted in infancy. Ecological psychology provides a foundation for a conception of environmental education that extends beyond the school to all areas of a child's life and furthermore, to all periods of the life span. It lays responsibility for the quality of environmental learning not only on the

shoulders of school administrators and teachers, but also on parents, city planners, public officials, and other people whose decisions shape the places where children live and the opportunities that these places afford.

6.3 An Ecological Theory of Perception and Action

Ecological psychology offers a strong foundation for conceptualising children's environmental learning and participation, in both the formal and informal sense, for at least three reasons. It focuses on children's agency, it describes the environmental context of action and development, and not least, it places children and the environment together in a common realm.

Although people caught up in the natural attitude of everyday life generally assume that they perceive their surroundings directly, this is not the dominant epistemology of psychology and the social sciences. The view that has gained wide currency in these fields is that people never know the world as such but only mental representations of it. Social constructivist theory – a version of this representationalist view that has gained particular prominence – posits that individuals inhabit separate subjective realms that are socialised by gender, class, ethnicity, and all of the other contingencies of social existence. This view places the world and people's awareness of it in separate physical and mental realms and emphasises divisions in human experience.

Ecological psychology does not deny the variety of human cultures and individual differences, but it does maintain that as humans we share a single and singular planet where we have evolved fundamentally common characteristics. Our co-evolution with other elements of the environment, as well as our cultural evolution, points to a relational theory of perception and action. According to a central principle of ecological psychology developed by James and Eleanor Gibson (Gibson and Pick 2000; Gibson 1966, 1979), to be a living organism – to be animate – means to have agency that functions in the service of maintaining an awareness of the environment. Action is a means of staying in touch with the environment's significant properties: whether this be an infant following its mother's face with its gaze or an adult striding through the landscape. The evolutionary history of each species includes selection for systems of perception and action that detect aspects of the environment with functional significance. Awareness of the world always occurs within this animal–environment relationship, and thus the mind and the world are not two separate realms, mediated somehow by a mental representation, but reciprocal facets of a shared functional system. Rather than being mediated, this relationship is direct.

To take the case of vision, which James Gibson (1979) studied intensively, the properties of objects are carried to the eye as structures in reflected light. These structures serve as potential information about the objects and their qualities, available for all perceivers who are present. Because reflected light carries a multitude of information from all sides and as different perceivers may be attuned to different features of it, they may not see the same thing. What they see, however, *are* features

of the world, not mental fabrications. The stimulus information around them constitutes a common ground. Therefore, with experience, people can learn to see the same features of their shared world.

This view of perception leads to another contribution of the Gibsons' ecological approach: the concept of *affordances*. Affordances are relational, functionally significant properties of the environment. By this view the meaning of environmental features is inherent in the relationship between the environment and an individual, rather than being a mental construction imposed on the environment. For example, children can build a tree house only if the specific properties of the construction material and the tree match the competencies of the children and the goals of the task. They can climb into the tree only if its branches begin low enough relative to each child's height and reach. They can build a platform to stand on only if the boards are light enough for these children to lift but sturdy enough to bear the children's weight. From the perspective of *these* children, *these* environmental features are functionally meaningful and their meaning is specified relative to the properties of the objects, the task and the children considered together.

This example also serves to illustrate the relationship between perceiving and acting discussed previously. Perceiving and acting proceed together in a system that is simultaneously defined by the environment's properties and by a creature's body, capabilities, and goals. In addition, this example demonstrates Edward Reed's (1996a) distinction between *exploratory* and *performatory* activities. In exploratory activities, an animal scans and tests the properties of the environment without significantly altering what it finds. In performatory activities, it alters the environment according to its goals. Yet successful performance depends on experience gained from exploration. The children had doubtless tested the properties of trees, boards, and their bodies before they carried out their work. In the process, they discovered values and meanings inherent in the environment that they could put to use. This example also shows that the world of culture and the natural world are inseparable. People typically learn performatory actions in social groups but the cultural world that they construct depends on the properties of the natural world.

This view of agency and perception avoids a matter–mind dichotomy. It places humans in a world in which they have co-evolved with other living things, dependent on the intrinsic qualities of the world, its resources and its limits, but equipped to discover what these qualities and limits are. It recognises that humans, like other animals, alter their environment, but in the process they need to preserve the resources that are the conditions for their well-being. Because ecological psychology emphasises these common dimensions of human life it forms a basis for collective action for the environment.

This emphasis on agency is in harmony with the goals of participatory environmental citizenship, which seeks to engage people in actively learning about, monitoring and managing their surroundings. According to both ecological psychology and this view of participation, people flourish more fully when they have a rich range of opportunities to realise their capabilities, and their capabilities include seeing the environment accurately and knowing how to take effective action in

response. For all of these reasons, ecological psychology forms a sound theoretical foundation for environmental education.

Although it gives due attention to the intrinsic qualities of the physical world, ecological psychology does not deny the social and cultural dimensions of action. As Reed (1996a) has noted, humans have evolved very special modes of action and awareness that are highly interactive and imbued with symbolism. At around six months of age, children begin to pay attention to features of the environment to which another person is attending. This achievement of joint attention forms a basis for all subsequent instruction and learning. From this time on, whether others are teaching deliberately or by chance example, most of children's discoveries build on involvement with others who direct their attention to particular features of their surroundings. At first, these features are primarily concrete, but as children grow, they increasingly include abstract relationships and ideas. Barbara Rogoff (1990) describes this way of learning through joint attention as a series of apprenticeships with people who are more experienced in different domains. This point, too, is vital for environmental education.

These principles of ecological psychology suggest that the following conditions support the development of children's environmental awareness and competence:

- Affordances that promote discovery and responsive person/environment relationships
- Access and mobility to engage with affordances
- Perceptual learning to notice and value the environment
- Opportunities to take responsible roles in community settings

The following sections of this chapter will take up each of these conditions in turn and suggest their implications for environmental education.

6.4 Affordances that Promote Discovery

People are most likely to continue to engage with the environment when they receive immediate information in response to their actions. Even infants, who are so limited in their ability to act on the world, seek to catch their mother's eye and if she smiles back, a coordinated exchange begins in which the infant's wiggles and kicks activate its mother's encouragement (Stern 1985). This relationship is equally true in interactions with the physical environment. Rovee-Collier (1986), for example, compared infants as young as two months under two conditions. One set of infants had a cord from a mobile that hung over their crib tied to their ankle, so that they could make the mobile move by kicking. For another set of infants, the mobile was moved by the experimenter. When the infants caused the mobile's movement, their rate of kicking increased. When their kicking had no effect, it rapidly declined. The infants were motivated to continue to engage with the mobile when they could see themselves producing effects by their own actions.

This reciprocity between self-produced action and environmental events lies at the heart of the development of a sense of competence (Bandura 1997). For this reason, Fuglesang and Chandler (1997) argue that responsive early childhood programmes and parent training to increase interactive experiences of this kind are important precursors to children's readiness for more formal types of participation. In research with adolescents and adults, this experience of self-efficacy promotes learned optimism (Seligman and Csikszentmihalyi 2000) and life satisfaction (Ryan and Deci 2001). As Bandura (1997) has noted, to inspire people to continue working towards goals, nothing is as motivating as 'mastery experiences' of their own capability.

Environmental features vary, however, in the degree to which they provide these effects (Heft 1988; Kytta 2002). For ball play, rollerblading, or cycling, nothing is better than hard, flat surfaces. For most other actions, children need a more malleable world. Natural elements are particularly rich in the effects they offer, and what is more, although they are predictable to a point, they also offer intriguing surprises. Water flows and splashes in fluid forms. Soft earth can be dug and moulded in infinite iterations. Every rock has a different heft and shape for building. Every rotting log reveals a different universe of insect life inside. Convivial city streets and public spaces offer similarly responsive settings for social interactions, which – like natural elements – never do exactly the same thing twice.

In environmental autobiographies, childhood places that afford experiences of this kind resonate in memory. Adults' accounts of special childhood places show that they tend to be on the margins of the adult world, where children can find freedom to take risks and prove themselves, get dirty, make and unmake play worlds with abandon and interact intensively both with the physical world and with friends (Cooper Marcus 1978; Goodenough 2003). These sites include tree houses, play forts, creek banks, and overgrown lots, colonised by children on the edge of the adult world in both cities and rural areas. They also include public spaces where children feel welcomed by adults. Ethnographic work with contemporary children shows that these opportunities for interactive engagement still figure prominently in children's choices of favourite places (Chawla 1992, 2002).

When environmental activists and environmental educators are asked about their sources of commitment to their work, one of the most frequent reasons that they give is the experience of natural areas of this kind in childhood or adolescence (Tanner 1998). Not only is the natural world responsive, but it yields alluring sensory information. This quality is evoked by the words of an Australian teacher in a study that asked environmental educators in nine countries to write about significant experiences that led to their environmental concern:

Sensory flashes of childhood: being swooped by magpies; listening to the rain on our tin roof; smelling pine needles under shadowy trees; building cubbies from bracken fern; caring for and sharing life with pets; awe-inspiring thunderstorms; the taste, smell and chill of the sea. (Quoted in Palmer *et al.* 1999:184.)

Similarly, a study of citizens in England revealed that memories of nature play in childhood emerged as a major reason for people's concern to preserve parkland and wild areas (Harrison *et al.* 1987).

When environmental educators and activists describe their formative experiences, they mention natural areas outside school more often than schools. Yet schools can provide these experiences too if they turn their yards into natural habitats. An evaluation of these changes at a California elementary school showed that children value what they gain. The following statements are representative of 50 students who were interviewed about their reactions:

When I see another school I think, too bad, they've just got a cement yard and we've got trees and a river and ponds with fishes, frogs, tadpoles, snakes and a turtle.

You would never say, "Let's go outside and learn about a cement yard." Now there is always something new to find out.

I know how it *feels* to have ponds. I know what lives there. I've seen the way ponds change. (Quoted in Moore 1989:203, 205.)

This emphasis on affordances that promote discovery owing to their responsive nature also applies to the design of participatory projects with children. The wheels of community change often grind slowly and the realisation of children's recommendations often depends on many other stakeholders. It is therefore important to build in a sequence of goals, from those that are securely within a group's own power to more ambitious distant goals. For example, while children are working on the clean-up of a local stream, they can restore a wetland in a corner of their school grounds.

6.5 Access and Mobility

No matter how rich the array of affordances may be in children's surroundings, they are of little consequence unless children can reach them. As Kytta (2004) has observed in her study of affordances for children in a variety of communities in Finland and Belarus, the best places for children provide 'positive interactive cycles'. In this case, children enjoy independent mobility to explore their surroundings and when they get out, they discover responsive affordances. As a consequence, they feel motivated to explore further and in doing so, they discover more. In the process, they build a growing repertoire of environmental competencies.

Children themselves consider freedom to move about safely an important measure of a good place in which to grow up (Chawla 2002). In contrast, studies from industrialised nations around the world indicate that children's independent mobility and access to natural areas is eroding. In a world of rapid urbanisation and rising populations, a number of barriers impede access – the hazards of automobile traffic, crime and pollution, parents' fears of strangers and children's fears of bullies (see, for example, Chawla 2002; Rissotto and Tonucci 2002; Kytta 2004). In one of the most systematic studies, Gaster (1991) examined children's free play in northern Manhattan from 1910 to 1980. He found vanishing natural play areas and, since the 1940s, a decrease in the number of places that children visited, combined with

a steady increase in the age at which they were first allowed out alone and in the amount of adult-supervised play. Recent studies of children's free range show that it is not unusual for urban children to stay within their block or immediate housing site, even in adolescence (Chawla 2002).

Considering how often people cite childhood play in nature as a reason for environmental concern and commitment, provision for environmental learning needs to include a broad vision of urban planning. In addition to naturalising schoolyards, much can be done to increase children's free access to nature even in densely built cities. Nature can be brought near through landscaping, site design, and affordable and secure public transportation to resources like parks and ecological reserves (Chawla and Salvadori 2003; Louv 2005).

6.6 Perceptual Learning

Children are rarely alone as they detect information present in their surroundings. Even if no other person is nearby, children exist in worlds that are structured by others. Often it is a structure that is deliberately designed to guide children's behaviour such as a toy placed near at hand or the bars of a crib to contain movement. In other words, even when children enjoy *fields of free action* where they explore autonomously, they usually move within *fields of promoted action* or *constrained action*, where a distinction between the physical and social world is artificial (Reed 1996a; Kytta 2004).

When adults and other children are nearby, they often collaborate to help a novice child learn a new activity or joint task. By placing resources within a child's reach, by direct aid or by example, they 'scaffold' learning (Vygotsky 1978). In a variety of ways, the principle function played by more experienced people is to direct the learner's attention to relevant features of the task. They may do this by verbal instruction, but what the guide knows is often tacit and not easily articulated in words. In this case she may point, position an object so that the critical feature will be noticed, or simply say 'look!' or 'listen!'. These are the conditions of apprenticeship in the broadest sense and the contexts for social learning that is so characteristic of human beings (Rogoff 1990, 2003). They are also the conditions for perceptual learning, which involves becoming selectively attuned to particular information out of a larger field of potential information.

Representations of the environment in books and on television and computer screens can contribute to this process of learning to see, but Reed (1996b) argues that they can never replace the role of direct experience. *Primary* or first-hand experience of the world exposes a person to inexhaustible possibilities for learning, and the richer the environment, the richer the possibilities. A person outdoors encounters a dynamic, dense, multisensory flow of diversely structured information. In *secondary* experience, when people learn about the world second-hand

through texts, images or someone else's story, this information is radically reduced. The realm of full-bodied primary experience is also where people form personal relationships and place attachments – where they find people and places to care for and others to join with them in action. Despite the growing importance of the internet for political and environmental organising, people who work to defend wild places report that they draw strength from their bonds with real places and from face-to-face networks of supportive people (Zavestoski 2003).

The power of simply drawing attention to elements of the natural world in an appreciative way is suggested by the fact that another reason given by environmental educators and activists for their concern and commitment, often mentioned as frequently as a special childhood place, is an influential role model such as a parent or other family member (Tanner 1998). What people recall are rarely didactic messages such as 'you ought to protect wild areas'. Instead, they remember people who drew their attention to the natural world as something worth valuing. As a Norwegian biologist who fought against the damming of wild rivers recalled, everyone in Norway in the 1950s went hiking, berry picking, and fishing. What distinguished her family was that, 'My mother knew the names of the plants more than other mothers did. So we talked more deeply about things. We didn't only fetch berries and fish, but talked about it' (quoted in Chawla 1999:20). Sometimes this instruction was wordless. Another activist, who fought against the damming of a wild river in Kentucky, tried to understand why he was different than others of his age who also grew up hunting and fishing. He described a father who, 'could teach you how to make a willow whistle or a pop gun out of certain things or how to find the fishing bait under the rocks and appreciate what's there. Or who takes you out on the porch when a thunderstorm comes in so you could enjoy it' (quoted in Chawla 1999:20). This combination of special childhood places and people is exactly what the naturalist Rachel Carson advised for an undying sense of wonder. In addition to abundant time in the natural world, she wrote that each child, 'needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in' (Carson 1956:45).

Certainly, teachers too can direct children's attention to the natural world. Although time in nature in childhood and influential family members or friends are the most frequent reasons that environmental activists and educators give for their concern and commitment; education is another reason mentioned, often third or fourth in frequency (Tanner 1998). At their best, schools use the processes of scaffolding, directed attention, and apprenticeship to encourage children to notice the environment in new ways and value what they see. However these concepts point to the importance of fieldwork beyond the classroom, where children can be surrounded by the world that they are learning to observe with closer attention. Because teachers can rarely equal the influence of parents or other family members in a child's life, schools should also reach out to families, communicating the importance of sharing appreciation for the natural world and seeking to include family members in environmental education activities as often as possible.

6.7 Participation in Community Settings

Aldo Leopold (1949/1966) remarked that as people learn to notice places around them with a keener eye, they begin to see wounds on the landscape. As young people discover problems, if they are to believe that they can help solve them, they need to feel like a part of their community and find channels open to them to participate in environmental decisions. Another tool from ecological psychology – the concept of *behaviour settings* developed by Roger Barker – provides a means to assess opportunities for individuals to participate in the social life of their community and to play a role in charting its direction (Barker 1968; Schoggen 1989).

Behaviour settings are places where individuals gather to engage in coordinated activities. They are constituted by individuals' actions together, as well as the affordances of the place that make these actions possible (Heft 1989, 2001). Like affordances, behaviour settings are real physical entities with perceptually meaningful features, for example, a gathering of an environmental organisation at a particular time and place. They are also similar to affordances because some behaviour settings are more responsive than others to an individual's actions and, in this way, offer better support for the development of competence.

Barker (1968) distinguished different 'zones of penetration' that an individual can occupy in a setting, which correspond to varying levels of involvement and responsibility in contributing to a group's goals:

1. *Onlooker*, who takes no active role in the setting
2. *Audience*, who has a recognised role, but very little power
3. *Member*, who has potential rather than immediate power, such as an organisation member who is eligible to vote for officers
4. *Active functionary*, with power over part of the setting, such as someone engaged in group activities like conducting a bird count or monitoring a stream
5. *Joint leader*, with immediate but shared power over the entire setting
6. *Single leader*, with immediate and sole authority over the operations of the setting

Because the concentrated power of a single leader violates the spirit of participatory decision-making, its presence in a programme is a sign of dysfunction. Otherwise, the deeper that young people penetrate into a setting, from peripheral levels that primarily involve observation to central levels with considerable influence over activities, the more engagement and responsibility they take on and the correspondingly greater opportunities they enjoy to develop a range of competencies.

Research in large and small schools (Barker and Gump 1964) and different communities (Barker and Schoggen 1973) has shown that the availability of responsible positions affects the likelihood that children will take on multiple roles and experience leadership. This research provides a model for how the idea of zones of penetration could be applied in planning and evaluating participatory programmes with

children. It shows how to identify existing behaviour settings where children may already be playing active roles in their community and where action for the environment might be introduced. It also indicates the importance of planning programmes that give positions of influence to as many children as possible. For example, a weekly child-run radio programme on community issues requires a large number of ongoing roles such as researchers, reporters, informants, editors, and technicians. Child-to-child teaching, such as high school students preparing and presenting environmental lessons to elementary school students or older children leading younger children on field trips, provides other examples. In addition to creating many responsible roles for young people to fill, activities of this kind create many occasions for apprenticeships, not only between novice children and more experienced children, but also between child leaders and adult facilitators. Thus programmes of this kind provide key ingredients for the development of competence: role models who include peers and encouraging adults, guided participation in fields of promoted action, opportunities to influence the setting, and experiences of achievement.

In two comprehensive reviews of what motivates people to take action for the environment, some similar variables emerge. In the analysis of Hungerford and Volk (1990), 'environmental sensitivity' is the major entry-level variable that predicts responsible environmental behaviour and it is derived from significant life experiences such as positive experiences of the natural world in childhood, and early role models who communicate nature's value. Other critical variables include a personal investment in issues, knowledge and skill in environmental action strategies, and a belief that one's actions can have an effect. In a review by Stern (2000), important variables include biospheric values (care for plants, animals, and communities of living things) and the self-perceived ability to reduce threats to the environment. In both analyses, valuing the natural world and confidence in one's own ability to make a difference on its behalf are critical predictors of responsible action.

These conclusions correspond to the ecological view of human development presented in this chapter. Ecological psychology presents a theoretical rationale for the importance of enabling children to know the natural world through their own exploration of it and for the company of people who direct their attention to other living things in a way respectful of their inherent value. It also indicates the importance of providing children with opportunities to take increasing levels of responsibility for environmental decision-making and action, and thus develop their competences. In this way, children find occasions to develop confidence in their capabilities, including their ability to join with others for collective action, as they follow issues of their own interest and concern.

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