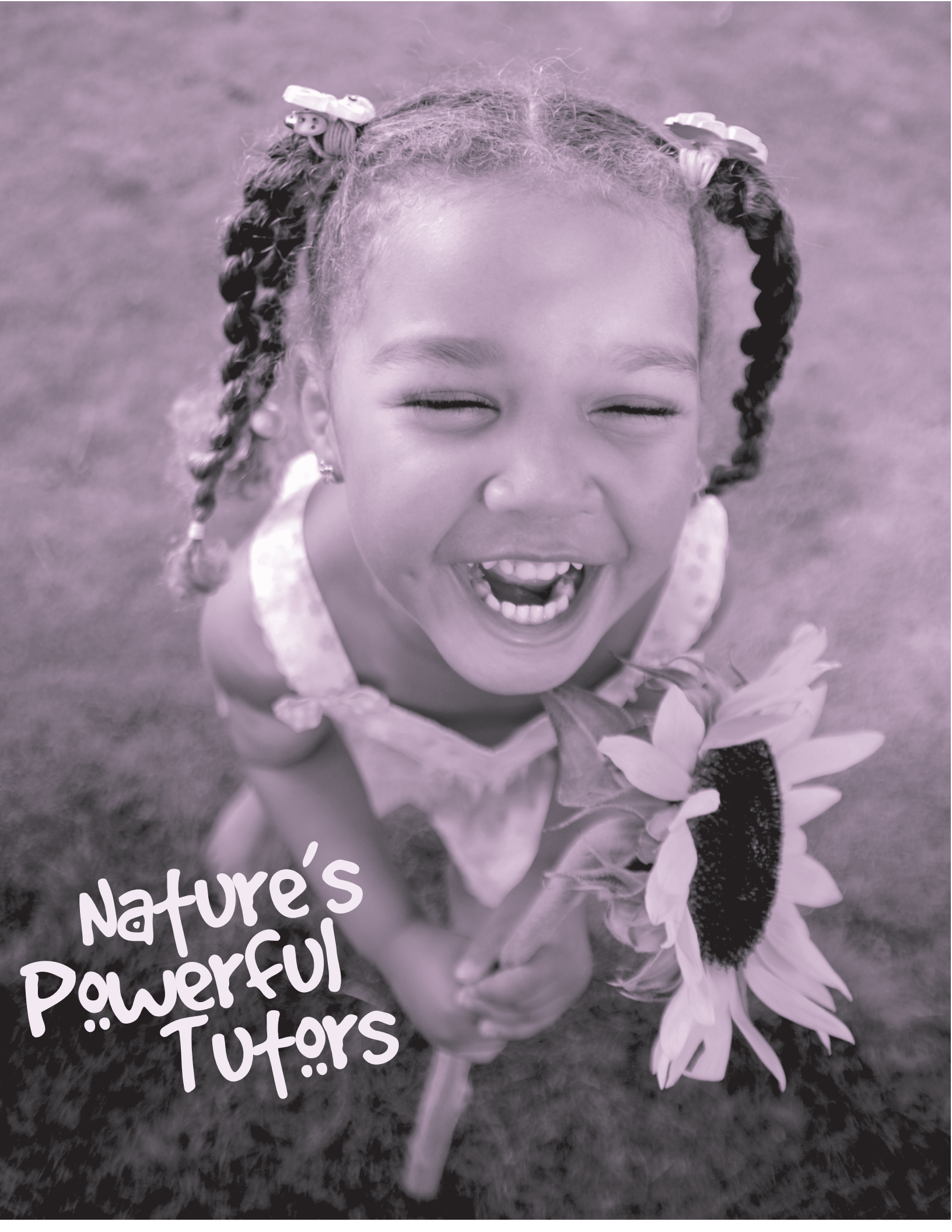
Nature's
Powerful
Tutors

The Educative Functions of Free Play and Exploration

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Everywhere, children play and explore when they have the opportunity, and they do so in certain universal ways. My thesis is that the drives to play and to explore came about in evolution to serve the function of education. Moreover—and this is the radical part of the thesis—I'm going to argue that these drives are so powerful, and so well designed for their purposes, that they can provide the foundation for education, even in our complex culture today. If we would provide settings that optimize children's opportunities for play and exploration, we would not need coercive schooling.

I will describe here three sets of observations that help convince me of the educative power of children's natural play and exploration.

Mitra's Demonstrations of Minimally Invasive Education in India

The first set of observations concerns some studies in India, conducted by Sugata Mitra, science director at an educational technology firm in New Delhi (Dangwal, Jha, & Kapur, 2006; Mitra, 2003; Mitra & Rana, 2001). Mitra and his colleagues installed computers outdoors in very poor neighborhoods and monitored the activity at each computer with the help of video recorders. They did this in 26 different places, with 100 computers in all.

The same general results occurred in each case. Children who had never seen a computer approached and explored this strange device, which looked to them like some kind of television set. They touched some of the parts and apparently by accident, discovered that they could move a pointer on the screen by moving their finger across the touch pad. This inevitably led to a series of further exciting discoveries. The pointer turned to a hand when it was moved to certain parts of the screen. By pushing (clicking) on the touch pad when the pointer was a hand, they could get the screen to change. Each new discovery, made by one child or a group, was shared with others. Within days, dozens of children were doing what children everywhere do when they have access to a computer. They were surfing the Web, downloading music and games, painting with Microsoft Paint, and so on. Children who could read sometimes found articles on topics that interested them. Children who couldn't read began to learn to read, as they recognized words on the screen that were read by others in their group.

Mitra's observations show how three fundamental aspects of human nature—curiosity, playfulness, and sociability—can combine to provide a powerful foundation for education. Curiosity drew the children to the outdoor computer and motivated them to manipulate it in various ways to learn about its properties. The manipulations led to exciting discoveries, each of which led to new questions and new discoveries. For example, the discovery that clicking on one icon caused the screen to change led children to click on all of the other available icons, just to see what would happen.

Playfulness motivated children to become skilled at using certain functions of the computer. For example, those who had already explored the Paint program and knew how to use it were motivated to play with that program, to paint many pictures, with the result that they became skilled at computer painting. Play helps children to consolidate knowledge they have already acquired and to develop skill in using that knowledge. In addition, play often leads to new discoveries that renew curiosity and lead to new bouts of exploration. Exploration leads to play, which leads to more exploration, and so on.

Sociability motivated children to share their discoveries with one another and to play together. When one child made a discovery, such as the discovery that clicking on an icon changes the screen, he or she would announce it excitedly to the others, and they, in turn, would try it out. Because of their sociability and language ability, each child's mind is networked to the minds of all of his or her friends. A discovery made by any one child spreads like a brush fire to the whole group of children nearby; and then some child in that group, who has a friend in another group, carries the spark of new knowledge to that other group, where a new brush fire is ignited, and so on, and so on. Mitra found that, because of such social networking, roughly 300 children became computer literate for each outdoor computer that he installed.

Mitra would love to have publicly available computers installed in poor neighborhoods throughout the world. Such installations, by themselves, without schools or teachers, would help wipe out illiteracy and give poor children access to the world's knowledge. Mitra (2003) refers to such education as "minimally invasive education;" a phrase he takes from the medical world's "minimally invasive surgery."

Anthropologists' Reports Concerning Education in Hunter-Gatherer Cultures

The second set of observations comes from anthropological studies of hunter-gatherer cultures. Agriculture was developed a mere 10,000 years ago (Diamond, 1997). For hundreds of thousands of years before, we lived in small nomadic bands and survived by hunting game and gathering wild edible plant materials. Our human nature, including our drives to play and explore, would have been shaped by natural selection during our hunter-gatherer period.

We can't go back in time to study our ancestors, but as recently as 20 or 30 years ago, it was possible for anthropologists to find, in isolated parts of the world, hunter-gatherer groups that had been almost untouched by modern civilization. As part of my studies of play, I have surveyed the anthropological literature on children's lives within such cultures. In addition, my graduate student Jonathan Ogas and I asked a number of anthropologists who had lived for extensive periods with hunter-gatherer groups to respond to a questionnaire about children's lives within the cultures they had studied (Gray & Ogas, 1999). Nine different anthropologists, representing six different hunter-gatherer cultures—three in Africa, two in Asia, and one in New Guinea—responded. Although each culture is in many ways unique, the literature survey and questionnaire revealed a remarkable degree of cross-cultural consistency. I can summarize the results as three general conclusions. (Literature supporting these conclusions includes: Draper [1976]; Gosso et al. [2005]; Konner [1972]; Marshall [1976]; & Turnbull [1968].)

Conclusion 1: Children in hunter-gatherer cultures have to learn an enormous amount to become successful adults. To become hunters, boys must learn how to identify and track the two or three hundred different species of birds and mammals that their group hunts. They must learn how to craft the tools of hunting, such as bows and arrows, blowguns and darts, snares, nets, and so on (the precise list depending on the culture). And, of course, they must develop great skill in using those tools. To become gatherers, girls must learn which of the countless varieties of roots, nuts, seeds, fruits, and greens in their area are edible and nutritious; when and where to find them; how to extract the edible portions; and how to process them. In addition, all hunter-gatherer children must learn to build huts, make fires, cook, fend off predators, predict weather changes, navigate their hunting and gathering grounds, treat wounds and diseases, assist births, care for infants, maintain harmony in the group, negotiate with neighboring groups, tell stories, make music, and engage in the various dances and rituals of their culture.

Conclusion 2: Children learn all this without being taught. Hunter-gatherers do not in any formal way teach their children. If you ask adults how children learn, they will say they learn on their own through self-chosen activities—activities that we would refer to as play and exploration. This appears to be true in every hunter-gatherer culture that has ever been studied.

Conclusion 3: Children are afforded a great deal of time to play and explore. The respondents to our questionnaire were unanimous in saying that the children and adolescents they observed were free essentially all day, every day, to play and explore on their own, and this fits with the conclusions of all of the published studies of young people's activities in hunter-gatherer tribes. Little, if any, productive work is expected of children or even of young teenagers. By their own choice, they play at the kinds of activities they need to practice. For example, boys play for countless hours at hunting, mimicking the behaviors of their fathers. With little bows and arrows, they may at first shoot at butterflies and toads and then at small furry animals near their camp. With time, they begin to actually kill some small game to add to the food supply. With further time, their playful hunting gradually becomes the productive hunting of adulthood—still done in a playful spirit.

The respondents to our survey referred to many other examples of valued adult activities that were mimicked regularly by children in play. Digging up roots, fishing, smoking porcupines out of holes, cooking, caring for infants, building huts, climbing trees, building vine ladders, using knives and other tools, making tools, carrying heavy loads, building rafts, making fires, defending against attacks from predators, imitating animals (a means of identifying animals and learning their habits), making music, dancing, story telling, and arguing were all mentioned by one or more respondents.

Studies of the Graduates of the Sudbury Valley School

The third set of observations comes from my own studies of the Sudbury Valley School, a radically alternative day school located in Framingham, Massachusetts. The school has been in existence for nearly 40 years, and I have had the opportunity to observe it and its students for about 25 years. The school is nonselective and has a very low tuition—much less than the per pupil cost of the nearby public schools. It accepts students age 4 through high-school age. At present it has about 200 students and 10 adult staff.

The school is remarkable in two closely related ways (Gray & Chanoff, 1986; Greenberg, 1970). The first has to do with its democratic administration. All school decisions—including the hiring and firing of staff members and the legislation of all rules of behavior—are made by the School Meeting, at which each student and staff member has one vote. The second has to do with the school's approach to education. The school was founded on the premise that children educate themselves best when they are free to follow their own interests. Just as hunter-gatherer children are free all day to play and explore on their own, so are Sudbury Valley students. Staff members serve as responsible adult members of the school community and are glad to respond to students' questions and requests for help, but do not see it as their job to direct, motivate, or evaluate students' learning. If you visited the school at any given time of day, knowing only that it is a school, you would assume that you had come at recess time.

Extensive follow-up studies of the graduates, including one that I conducted, have revealed that they go on to happy, successful, meaningful lives (Gray & Chanoff, 1986; Greenberg & Sadofsky, 1992; Greenberg, Sadofsky, & Lempka, 2005; Sadofsky, Greenberg, & Greenberg, 1994). Those who have chosen to pursue higher education have had no apparent difficulty getting accepted and performing well at good colleges and universities; collectively, the graduates have been successful in the whole spectrum of careers that our culture values. My own further studies have focused on how students learn at the school. I have found it useful to distinguish between two categories of learning: (a) basic skills, of the sort that everyone is well off knowing in our culture; and (b) special interests and passions, which are different for different students and commonly provide the direction for future careers.

Learning the basics. In a literate and numeric culture, children play at activities that involve reading, writing, and numbers, just as children in a hunting-and-gathering culture play at hunting and gathering. Children at the school typically learn to read in the course of their daily activities, often with little awareness that they are doing so. They regularly play games, including computer games, that involve written words. Young children admire the reading skills of older children and adolescents—who can often be overheard discussing books they have read—and are eager to join

the "club" of readers. Adolescents and staff members also enjoy reading to young children, and that provides an additional context for learning to read. Similarly, children learn the elements of arithmetic through such activities as making change, keeping score in games, cutting recipes into quarters or thirds, and so on. Social skills are even more basic to our well-being than are the three Rs, and children continually practice the skills of getting along with each other in their social play at the school.

Acquiring special interests and passions. Through their free play, students at Sudbury Valley become good at the activities that they most enjoy, and many of them go on to careers in those activities. Among the graduates are many successful artists and musicians who developed their love and skill at art or music in their play at the school. The graduates also include many computer software designers and IT specialists who developed their computer skills through play. Here are a few other examples (taken from the previously cited studies of graduates):

One graduate is a skilled machinist and inventor. When he was a young child at the school, he was the leader of a group of boys who would build whole cities of Plasticine, making everything to scale. From that, he went on to taking old tricycles, bicycles, and eventually automobiles apart and putting them back together, sometimes in innovative ways.

Another graduate, who became captain of a cruise ship, developed her love of boats through play at the school. Another, who is now a professor of mathematics, developed his love for math initially through a fascination with science fiction and role-playing games based on science fiction. He discovered that good science fiction starts with some arbitrary proposition and develops its consequences in a logically consistent way. Later, he discovered that the same is true of mathematics. Still another graduate, who is a highly successful fashion designer, began by making dolls' clothes and then, clothes for herself and friends.

Of course, not all graduates of the school have gone from their childhood playful interests to careers in the same field. In many cases, students developed a broad set of skills and interests and took some time, after graduation, to determine a career direction.

The Value of Age Mixing

All the observations that I have described here involve settings where children interact across a broad range of ages. When we segregate children by age, we deprive them of the playmates from which they have the most to learn. In a long-term qualitative study of age mixing at Sudbury Valley, my former graduate student Jay Feldman and I identified many ways by which age mixing optimizes the educative power of play and exploration (Gray & Feldman, 2004; Feldman & Gray, 1999).

Age-mixed play is less competitive and more nurturing than same-age play. When players differ widely in age, experience, and ability, there is no point in trying to prove oneself better than others. Rather than focus on winning, players find ways to make games fun and challenging for all concerned. Age mixing is valuable both to the younger and the older children involved.

Younger children benefit by being exposed to the more sophisticated activities and abilities of older children, among whom they find role models. A useful idea here is Lev Vygotsky's concept of a zone of proximal development: defined as the realm of endeavors that a child can do in collaboration with more skilled others, but cannot do by himself or herself or with others at his or her same level (Vygotsky, 1978). For example, two 4-year-olds cannot play a simple game of catch. Neither can throw or catch well enough to make the game fun. However, a 4-year-old and an 8-year-old can play catch and enjoy it. The 8-year-old can toss the ball gently into the hands of the 4-year-old so the latter can catch it, and the 8-year-old can run and leap and catch the wild throws of the 4-year-old. So, catch is in the zone of proximal development for 4-year-olds. We have made analogous observations for many intellectual and social skills, not just physical skills.

Older children also benefit in many ways from their interactions with younger ones. In age-mixed play, older children have opportunities to practice leadership and nurturance and to consolidate their own knowledge through teaching. Also, the creative activities of younger children inspire older children and adolescents to continue to play at such activities as painting and modeling with clay, and to develop artistic skills.

As a culture we are affording children continuously less opportunity for free play, unguided by adults, and continuously less opportunity to interact with children who differ from themselves in age. The observations I have described here suggest that, in letting these trends continue, we are depriving children of the most enjoyable routes to education.

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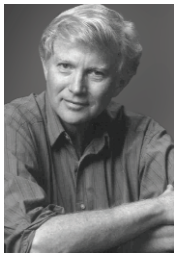

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