Ch. Maas Geesteranus

YOUNG ADOLESCENTS' PERCEPTIONS OF NATURE AND ENVIRONMENTAL ISSUES: IMPLICATIONS FOR ENVIRONMENTAL EDUCATION IN URBAN SETTINGS

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Natural Resources)
in The University of Michigan
1991

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This book consists of a re-formatted and slightly modified version of the official dissertation that can be found under the same title and author name in Dissertation Abstracts International, Dissertation Abstract Online, Dissertation Abstracts Ondisc, Comprehensive Dissertation Index and American Doctoral Dissertation. The reformatting has reduced the number of pages from 294 to 241. The minor modifications consisted of elimination of some typographical errors and the occasional clarification of meaning.

This dissertation has been written in American English (as opposed to English).

The official citation of this work should be: Arjen E.J. Wals. *Young Adolescents' Perceptions of Nature and Environmental Issues: Implications for Environmental Education in Urban Settings*, Doctoral Dissertation, University of Michigan, Ann Arbor, 1991.

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To the children of Detroit who have been deprived of a basic right of childhood --the right to experience and explore the world around them safely, spontaneously, and on their own terms.

ACKNOWLEDGEMENTS

Many people deserve to be acknowledged for their involvement in the creation of this dissertation. I would like to thank Professor Bill Stapp of the University of Michigan's School of Natural Resources for supporting me in my application to enroll in the graduate program. Not many students from other countries are accepted in the School of Natural Resources and I felt honored to be chosen by Bill to become one of his last Ph.D. students. In addition I would like to thank him for his tremendous dedication and commitment to environmental education in particular and people in general. To me and to many of my colleagues, Bill was, and continues to be, a source of inspiration and motivation.

I also express my gratitude to the other members of my dissertation committee. Professor Ton Beekman and Professor Loren Barritt, not only for encouraging me to question the foundations of knowledge and to rethink the purpose and nature of scientific inquiry, but also for helping me preserve my sense of "Dutchness," during the weekly "Dutch lunches." I would like to thank Professor Bunyan Bryant for supporting my phenomenologically oriented research approach and for giving me valuable insights in the dilemmas African-Americans face in today's society, particularly in relation to environmental issues. I would like to thank Professor Paul Nowak for having enough faith in me to join the committee at a late stage when the research already had been carried out and for taking the extra time to familiarize himself with my work.

I wish to acknowledge the following people and institutions; the Netherlands America Commission for Education Exchange for awarding me a Fulbright scholarship which made life a lot easier in Ann Arbor; the Dutch Ministry of Agriculture, Nature Conservation & Fisheries, particularly Drs. Dirk Huitzing and Drs. Jaap Pieters, for sponsoring a portion of the research and for keeping me up to date on recent developments in environmental education in The Netherlands throughout my time in Michigan; Mare Cromwell for providing a home away from home; and my fellow students at the School of Natural Resources with whom I worked on a variety of side projects and with whom I shared lots of laughs. Of course I am also grateful to the teachers (Ollie, Phil, Sonya, Ed, Randy, Tom, Barbara, Tony and Christine), students (the Rumeals, Lashantes, Bills and Melissas whose stories are being told in this dissertation) and administrators of the schools who made this study possible and worthwhile.

I also wish to thank my parents, Joke and Harry Wals, for always taking me and my brother and sisters on nature walks throughout our youth and for ultimately inspiring me to enter the field of environmental education. I would like to express my gratitude to Jim and Anna Ritter for proof reading the final draft. Lastly, I wish to thank my wife, Anne, for being so patient, for having the faith in me that in the end I would actually finish this project and for being so supportive of my work over the last four years.

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CHAPTER I

PROBLEM STATEMENT AND RESEARCH APPROACH

1.1. Introduction

"The surrender of our thinking to rationalism and of our artifice to technics have consequences which console us with the feeling that we are progressing, but make us neglect or deny fundamental forces of our inner life which are then turned into forces of destruction. The sclerosis of objectivity is the annihilation of existence." (Philip Mairet, describing the ideas of German existentialist Karl Jaspers in the introduction to Jean-Paul Sartre's "Existentialism and Humanism." (Sartre, 1948).

"[S]tories of environmental education produce and reproduce the kinds of metaphors and myths that support the positivist "scientific detachment" from nature rather than "intractable involvement" in it. There is nothing particularly surprising about this: the cultural successes of modern Western science are founded on the heuristic value of separating matters of "objective" facts from matters of "subjective" value. .....But we can no longer take it for granted that what once was good for modern science is necessarily good for the postmodern planet." (Noel Gough, 1991; 34).

Several presuppositions lie at the core of this dissertation. First, there is the presupposition that environmental education has the potential to lead to educational reform that ultimately can help reshape relationships between people and between people and their surroundings. This assumption holds that environmental education is seen as a *process* that can lead to educational change (as opposed to an instrumental tool that can lead to behavior modification in a pre-, expert-, determined direction), that educational change (as opposed to educational enhancement) is needed, and, finally, that there is something wrong with the *relationships* among people and between people and their environment (as opposed to there are flaws in peoples' individual and collective behaviors and the systems they control).

The second presupposition is that environmental education should lead to the development of autonomous thinking about issues that affect the quality of life of humans and other species. This idea has several implications that need to be considered carefully. Autonomous thinking about environmental issues, or any issue for that matter, suggests that it would be wholly inappropriate to prescribe behavioral outcomes that a learning activity or sequence of activities need to foster. Bob Jickling, for example, writes that he would not want his children to be educated for sustainable development, because it goes against the idea of education: 1) it suggests education then becomes *training* which is the acquisition of skills and abilities which has instrumental connotations and can technically occur through repetition and practice without leading to understanding, 2) the concept of sustainable development is contested,[1] which makes teaching *for* it doubtful at least, and 3) the prescription of a particular outlook conflicts with the development of autonomous thinking (Jickling, 1991). This is not to say that we should not educate *for* something. Educating for the environment, for instance, is needed to prevent this planet from dying. The issue here is: how do we go about teaching *for* something and who decides what we are for? In schools, for instance, do we involve teachers, students and community resources in deciding what is good for the community and the local environment or do we decide for them?

A similar concern is expressed by Max van Manen in his discussion of the popular skill of critical thinking which he argues is often regarded as being synonymous with cognitive skills represented by terms such as "good thinking," "thinking straight," "logical reasoning," or with "problem-solving skills." Van Manen, concerned with emancipatory education, suggests that

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[1] The concept of sustainable development is contested for several reasons. For one, the word "sustainable" poses problems. A landfill, for instance, is a sustainable ecosystem, but of very low quality. The word development in the context of Third World development is also problematic for reasons to be described later. Combining the words to "sustainable development," technically leads to an oxymoron. Without ascribing qualities to the concept, the concept becomes hollow. It is precisely the ascribing of qualities that is political and contested. It is therefore more useful for students to learn *about* sustainable development and the different ways of looking at it so that they can make up their own minds.

all these abstractions are part of the empirical analytical tradition which lacks a more reflective reference frame:

> "The theoretical base of empirical-analytical science is too narrow, not taking into account a more complete concept of social science inquiry, and it is inappropriate simply for reasons that it is essentially not critical in a more emancipatory sense. Emancipatory awareness leads to the possibility of self-determination with some degree of freedom from blind psychological, political or economic compulsions. .....It involves inquiry into the social origins, consequences, and functions of knowledge." (Van Manen, 1975; 17).

The above reasoning suggests that environmental education should not be defined in terms of desired behavioral outcomes and that the *for* part of Lucas' widely cited article *"The Role of Science Education in Education for the Environment,"* should be re-examined (Lucas, 1980). Defining environmental education thus becomes problematic and undesirable if it would require universal goals and objectives that would be superimposed upon schools and communities regardless of the contextual realities that challenge them. Doing so would reduce environmental education to an untouchable, abstract object and would reduce the people affected to the status of things. Jickling even suggests that environmental education then becomes "a treasure hunt for an infinitely illusive abstract object." (Jickling, 1991; 5).

The third idea is that our planet is facing destruction as a result of symptomatic environmental problems such as; overpopulation, deforestation, excessive and hazardous waste, and the degradation of water, air and soil, which ultimately are rooted in the unequal distribution of wealth, the uninhibited strife for economic growth, and inadequate education (CEI, 1991). Again this idea includes several points of view which are still contested, including the ideas that there are limits to growth, and that resources, including human resources such as education, should be distributed in a more equitable manner. Many international statements on environment and development do not seriously challenge the principles of economic growth or even the inequitable distribution of resources (IUCN, 1980; World Commission on Environment and Development, 1987).

At the same time the statements generated on the subject of environment and development, tend to perpetuate the myth that there are

developing countries and *developed* countries. This myth suggests that it is possible for a country not to develop and separates the problems of the North from problems of the South which in itself makes finding solutions more problematic. On another level it allows governments in countries from the North, also referred to as "the West," such as the United States, to deny that environmental degradation within their own borders is often the result of the same processes that take place in the so-called developing countries. The conveniently created "North-South" or "developed-developing" dichotomy might just as well be used as metaphors to describe differences between "inner-city" and "suburb" or "working-class" and "upper-class" or "middle-class" on a national, regional and local level.

These three presuppositions: environmental education (EE) as educational reform and the rejection of EE as an instrument to modify behavior in a predetermined direction, education as a process that leads to autonomous thinking, and the environmental crisis as a crisis rooted in inequitable distribution of resources and the uninhibited strife for economic growth, form the main biases I bring to this dissertation. These biases have consequences for my research interests and research approach to which I will discuss in this chapter.

Despite their good intentions, many EE projects seem to fall short in realizing ambitious learning goals such as "helping citizens become environmentally knowledgeable, skilled and dedicated people who are willing to work individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between the quality of life and the quality of the environment." (Harvey in Hungerford et al, 1980). Without always challenging the nature and content of these goals, many researchers and practitioners are trying to resolve this discrepancy between the theory and practice of EE. Some have tried to instrumentally structure EE content matter and the way it is presented to students using hierarchical levels of universal goals and objectives (e.g. Hungerford et al., 1980; Marcinkowski, 1990) whereas others who question the value or the status of universal goals and objectives, have put emphasis on contextual development of EE within the school community (e.g. Bull et al., 1988; Robottom, 1987). However, relatively little attention has been paid to the way young people come to

make sense of their own environment through their everyday interactions with(in) the lifeworld,[2] the kind of world they create for themselves, the extent to which this world is shared with others, and, finally, what meaning they ascribe to concepts important to environmental education such as nature and environmental problems.

The latter would mean the requiring of insights into human experiences and obtaining commonalties of understanding that would lead to improved communication and meaningful interactions between theorists and practitioners, teacher and students, and school and community (Van Manen, 1975; 1977). The concepts *human experience, commonalties of understanding, meaningful interaction,* are concepts which emerge from interpretive science traditions and stand in sharp contrast to concepts such as; *behavior modification, scientific generalizations, systems analysis,* which are used in the in North America dominant empirical analytical science tradition. A third tradition, the critical science tradition, not only rejects notions of behavior modification, prediction and control, but also maintains that in order to facilitate communication, meaningful interactions and commonalties of understanding, we need to examine the *power structure* that underlies aspects of social life and communication (Freire, 1986; Habermas, 1974; Van Manen, 1975).

Bearing in mind the three main ideas that influenced the construction of this dissertation, I will argue that given the nature of education and the nature of the environmental crisis, and given the non-prescriptive role environmental education should play in stimulating and shaping educational change, it is appropriate to use a research approach that does not distort communication by manipulation and control, but instead will allow those who are affected by education and educational change a) to express their ideas, b) to point out inequalities in resource access and power imbalances, and c) to help determine changes that they themselves find important. Since the participants of this study are middle school students who may lack

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[2] The word "lifeworld" is derived from the German "Lebenswelt" and is used to describe our own individual and socially constructed reality: our orientation towards the world which helps us determine how we define our situation, the way we look at things, what we believe to be true, valuable and real. In short: the kind of world we create for ourselves.

the*communicative competence* (Habermas, 1974) to recognize and verbalize power distortions and inequitable access to resources, the main subject of investigation was limited to the participants' ideas involving environmental issues and issues dealing with nature.

For more than fifty years constructivist approaches to learning have suggested that the pre-instructional perceptions, "mini-theories," and "misconceptions" of the learner play a key role in successful learning (or lack thereof) (Wals, 1987). Yet, unlike the reading and writing teacher who is very capable of determining at what "level" her student is, environmental educators have little understanding of their students' interactions with and perceptions of the environment and the "mini-theories" to which they lead. As I will argue later, this holds particularly true for environmental educators' understanding of the environmental perceptions of "minority" students who live in urban settings and who can be considered among the socially, economically and environmentally deprived.

The following research questions make up the guiding framework of this study: What do students from urban middle schools consider to be "nature"? What do they see as "environmental problems" and what kind of relationship do they see between themselves and these problems? How do they perceive environmental (including both the physical and the social) change? How do they see their own role within change? How do the different physical and social environments of middle school students, influence the perceptions of their environment? Having answered these questions: How can environmental education projects better build upon students' perceptions and be true to the contextual differences that can be found within the different school communities? In addition I was interested in students' general concerns and interests as well in order to get a better sense of how students' perceptions of nature and environmental issues fit in the larger landscape of their lifeworld.

The research draws upon interpretive and critical science traditions in an attempt to understand the participants' view of the world as manifested in their actions in their own lifeworld and their verbalized reflections on their position in this world, without from the start imposing my own views, ideas,

theories on them. With this dissertation I intend to advocate and obtain a better understanding of students' own perceptions, ideas and theories in relation to their environment, environmental issues and nature, in order to obtain new insights in adapting (environmental) education to the social (including race and class) and physical context in which the school community is embedded. Additionally, I hope to have captured the drama and the ordinary of the everyday life of the participants, without doing injustice to it in the process (such as controlling and narrowing choices), in order to affect not only the people themselves, but also the institutions and the society that (fail to) support them. The latter could also provide better insight in what concerns the students the most and what issues they would like to address through their education.

1.2. Background

My personal involvement in two environmental education projects facilitated by faculty and students of the University of Michigan's School of Natural Resources influenced the focus of this study -- young adolescents' perceptions of nature and environmental issues -- and the location of the study: the city of Detroit and two of its northern suburbs. I had personally been involved in facilitating these projects, particularly the Action Research & Community Problem Solving project, for almost three years. What follows is a brief description of both projects, complemented with some of the lessons learned during my involvement which have relevance to this study.

Action Research and Community Problem Solving

In 1985, the University of Michigan's School of Natural Resources developed, in conjunction with Deakin University (Australia), an approach to education that takes the world as perceived by the students as the starting point of their learning. A key assumption underlying the Action Research & Community Problem Solving (AR&CPS) model is that the school and its community contain an abundance of rich material for making education more meaningful. Furthermore, AR&CPS is geared towards substituting feelings of apathy and powerlessness with the feeling that one -- be it as an

individual or in a group -- indeed can make a difference. The approach therefore emphasizes that students should be given more responsibility in the planning of educational activities and should be provided with the opportunity to take responsible action in improving the quality of their school and community environment.

In cooperation with Faculty and Graduate students of the University of Michigan, teachers and students from the Ann Arbor and Detroit Public School systems, developed the model in different settings at various grade levels. The foundations and guiding assumptions of AR&CPS as well as classroom experiences and ways to start a similar project in your own classroom, have been put together in a handbook: "Education in Action: A Community Problem Solving Program for Schools." (Bull, et al., 1988).

Action Research (AR) is both a methodology and a way of thinking. Kurt Lewin (1946) is generally considered to be the founding father of the approach. AR can be described as "....a form of self-reflective inquiry; undertaken by participants in social (including educational) situations in order to improve the rationality and justice of: a) their own social or educational practices, b) their understanding of these practices, and c) the situations in which the practices are carried out." (Kemmis, 1980; 3). Action Research is rooted in "praxis," the process of reflection and action, and is a means for teachers to improve their own practice, to help students acquire knowledge and personal empowerment, and to adjust administrative policies to improve the learning environment (see also: Corey, 1953). In education, the approach has a dual purpose: 1) the improvement of the learning environment and 2) the empowerment of teachers and students. Hence, its overall purpose is the enhancement of the quality of education itself. Applied to environmental education, AR enables students to participate more fully in the learning process. They come to assume greater responsibility for learning as they become engaged in tackling and acting upon an environmental issue that they themselves have identified and recognized to be important.

The pilot-study at Potham Middle School,[3] which led up to this study, gave me a new perspective on AR&CPS. The study, as well as my classroom experiences, revealed that the intuitive claims the AR&CPS model makes do not hold up in some Detroit school communities. Talking to students about their school, neighborhood, family and expectations of the future, confronted me with a world in which students seem alienated from the world outside their community. Their world, to an extent, appears to be one of illusions, myths and denial that cries for change. Or as Banks put it:

> "One people cannot oppress another without creating conflict, a world of myths and illusions in which it becomes difficult, if not impossible, to distinguish the real from the make believe, and lies from truth." (Banks, 1972; 124).

It became clear to me that we -- the University of Michigan people going to Detroit schools -- had little understanding of the way these students experience their world. Freire writes:

> "It is not our role to speak to people about our own view of the world, nor to attempt to impose that view on them, but rather to dialogue with the people about their view and ours. We must realize that their view of the world, manifested variously in their action, reflects their situation in the world. Educational and political action which is not critically aware of this situation runs the risk either of "banking" or of preaching in the desert." (Freire, 1986; 85).

In other words, if we do not adapt schooling to the context in which it takes place, students in the inner-city will not get the chance to change their state of oppression through their education. On the contrary: avoiding to do this will reinforce the status quo of their situation.

If environmental education is not only education *about* and *in* the environment, but also -- and perhaps foremost -- education *for* the environment, then it is inevitably education for change. Education for social and environmental change requires an understanding of the way students "define" their own situations. Hence, it is important to become critically

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[3]This study has been documented in an unpublished manuscript titled: *Toward an understanding of growing up in an innercity Detroit neighborhood; Implications for Action Research and Community Problem Solving as an approach to education.* University of Michigan, School of Natural Resources, Ann Arbor, MI. (1989). Throughout this dissertation the names of the schools, students and the suburban communities involved in the study, have been changed to preserve anonymity.

aware of the way they perceive their world. Ideally, the students learn to interpret their situation as requiring intervention, especially their own intervention. If AR&CPS claims to build upon students' preconceived notions, "naive" ideas and their experiences with the environment, then it is crucial to find out what these notions, ideas and experiences are. At the same time, it is also important to know how the context in which the students grow up influences their environmental perceptions and how their notions, ideas and experiences influence schooling.

The Rouge River Project

In the Rouge River project, schools located in the same watershed monitor the quality of their river from upstream to downstream in a coordinated, joint program which in interdisciplinary fashion addresses the physical, biochemical, social and political aspects of water quality (Mitchell and Stapp, 1991). The Rouge project includes only the Rouge River watershed in southeast Michigan, which includes parts of Detroit and its northern suburbs, but the project has become a model for many watersheds around the United States and in other parts of the world (Ellis et al, 1991). The Rouge River project is linked to its spin-off projects and other water monitoring programs from around the world through the Global Rivers Environmental Education Network (GREEN). Locally, students from more than forty-five schools currently participate in the program, which takes place during an annual intensive two-week water quality immersion, usually in the month of May. Most teachers are assisted by University of Michigan students during the project.

My classroom experiences and conversations with students in the Rouge River project and students at Oak Park & River Forest High School in suburban Chicago (Wals, 1986) had led me to believe that many of the students in the suburbs have quite different notions of, for instance, environmental threats, than many of the students we worked with in the Detroit AR&CPS project. Whereas students in some Detroit schools tend to see crack/cocaine and violence in the neighborhoods as major threats to their environment, students in the suburbs often mention issues such as water pollution and toxic waste as major threats. This notion, combined with the personal desire to make the study more relevant to learning situations in my

home country, The Netherlands, motivated me to add a "cross-cultural dimension" to the study.

The Rouge River project includes schools from the "inner-city" as well as from rural areas and the "suburbs."[4] The water monitoring curriculum is basically the same for all participating schools, although there is room for teachers to add or cut certain components. If the perceptions students have about their environment, about pollution and about change are indeed different and dependent on the context in which they grow up, then shouldn't this have implications on what and, indeed, how we teach?

There is another concern I had which motivated me to add a cross-cultural dimension to the research. Students in the Rouge River project find out that as you go down the Rouge River, the water quality of the river decreases and the presence of heavy industry increases, as does the population of African-Americans and working class people. There is research that supports the claim that many African-Americans and working-class people tend to live in areas that are more directly exposed to environmental threats (McCaul, 1976; West, 1989; Russel, 1989; Bullard, 1983; Bryant and Mohai, forthcoming, 1992). If this is indeed the case then, shouldn't Environmental Education take into account the racial and class-related perceptions of the environment and of change?

Without backing it up with "scientific proof," I propose that those who are most directly exposed and affected by environmental threats -- whether it is because of race, class or both -- are also the ones who receive very little environmental education or education for change. If this is true, then

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[4] The terms innercity and suburbs are used somewhat simplistically throughout this dissertation and have intentionally been put between quotation marks here. I tend to use the terms conveniently for indicating a "certain" type of environment. The associations I had of innercity, at least prior to working there, were: "black," "poor," "working class," "poor education," "garbage filled open spaces," "closed stores," "unsafe," "high crime," "grey," "dirty alleys," "no trees," etc., whereas the associations I had with suburb were almost the opposite; "white," "middle class," "better education," "clean parks," "active shopping malls," "safe," "low crime," "broad lawns," etc. These stereotypes color our perceptions, easily distorting reality since in either environment associations of both kind can be found. The research aim of this dissertation was not to establish a causal relationship between "innercity" or "suburb" and young adolescents' perceptions of nature or of environmental issues.

environmental education becomes an elitist form of education that serves those who have the luxury (money, time, community support, and resources) to spend time to resolve environmental issues. Having attended four annual conferences of the North American Association for Environmental Education (NAAEE) in which, combined, almost 2,500 teachers and educators participated, I can not help but notice that there were only a handful African-American teachers present.

The Rouge River project, GREEN and the AR&CPS projects are exceptional because they involve people from different racial and socio-economic backgrounds in environmental education programs. Nevertheless, if the change component of environmental education is ignored, for whatever reason, then the projects inevitably fall short in helping students understand the roots of oppression and environmental deterioration. In order to move beyond the symptoms of environmental problems, we need to get better insight in how students perceive their environment.

This brings me back to the framework of questions that guided me in my research: What do young adolescents in the participating schools consider to be "nature"? What do they see as "environmental problems" and what kind of relationship do they see between themselves and these problems? How do they perceive environmental (including both the physical and the social) change? How do they see their own role within change? How do the different physical and social environments students inhabit influence the perceptions of their environment? Having answered these questions: How can environmental education projects better build upon students perceptions and be true to the contextual differences that can be found within the different school communities?

Finally, my personal involvement in both the Rouge River project and AR&CPS projects made the selection of the schools easier. I selected four schools: two Detroit middle schools that participated in the Action Research & Community Problem Solving project (one of the two also participated in the Rouge River project), and two middle schools from Barnsley and Forest Grove that participated in the Rouge River project. This had two main advantages: 1) I had visited the Detroit middle schools many times over a

period of two years, and knew some of the teachers quite well. My familiarity with some of the people and the setting helped me conduct the study in a more or less informal way in close cooperation with the teachers. 2) It made it possible to cover a broad array of perceptions constructed by young adolescents from very different backgrounds and situations.

Having described the two projects that led me to my research interests and the selection of the schools which participated in the study, I will now turn to the research approach I used to capture the essence of the students' perceptions of nature and environmental issues.

1.3. Research Dilemmas and Philosophical Considerations

> "Causal or mechanical thinking will have to be supplanted by dialectical thinking because..... experiencing creatures do not so much follow laws as *norms*, the difference being that experiencing creatures contribute to the *constitution of the norms they follow.* However, if one follows rules to which [s]he has contributed, then the relationship is not linear but dialectical because it is an internally generated relationship that carries with it the possibility of further change and development in either the behavior or the norm itself. With a positivism of laws, however, no deviation of growth is possible; things must simply submit." (Giorgi, 1975; 322).[5]

Human ideas, experiences, and intentions are not objective things like molecules and atoms. Nevertheless, just like some of their colleagues in the natural sciences, many educational researchers attempt to use "objective" methods that allow for the control, predictability and "generalizability" needed to uncover the "laws" or "patterns" that guide human behavior and the systems in which that behavior occurs. The scientific method constructed to do this, has long been claimed to be a value free tool of inquiry, allowing many social scientists to create a dichotomy between themselves, their methods and their research. This separation is a very dangerous one, for it gives scientists a false authority of truth that stems from the claims that there is an objective way to study an objectifiable world and that the only way to study this world is through rigorous application of the scientific method. So

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[5] Amedeo Giorgi in discussing Merleau-Ponty's critique of traditional psychology which can also be found in: Merleau-Ponty, M. The structure of behavior. Translated by Alden L. Fisher, Boston: Beacon Press, 1963.

far I have argued, and I will continue to do so in the remainder of this chapter, that: a) there is no objective way to study things, b) it is counter-productive and even dangerous to objectify the world, and c) that there is more than one way of knowing.

It is interesting to note that while the physicist's model of billiard-ball causality is still being used in much psychological, social and educational research, the model has been abandoned by many physicists themselves. Frank Smith writes:

> "To find exciting and imaginative theories today, throbbing with color and with marvel, one has to turn to astronomy, nuclear physics, or genetic biology. To try to comprehend what is dimly perceived through powerful microscopes and telescopes seems to require the mind of a poet. Why then should that most remarkable universe of all, the human brain, be approached in such a grey and mechanistic matter?" (Smith, 1985; 211).

Smith argues that science generally tends to derive its metaphors from contemporary technology in which the world, society and individuals and their brains are perceived in terms of computers. He and others reject the notions of the brain as a repository of information, thought as information processing, and learning as the mechanism by which new information is acquired (Smith, 1985, but also: Rumelhart and Norman, 1981 and Freire, 1986). The alternative according to Smith and many others (e.g. Giorgi, 1975; Roche, 1973; Beekman, 1984) is "that the primary, fundamental, and continual activity of the brain is nothing less than the creation of worlds. Thought in the broadest sense is the construction of worlds, both "real" and imaginary, learning is their elaboration and modification and language -- especially written language -- is a particularly efficacious but by no means unique medium by which these worlds can be manifested, manipulated, and sometimes shared." (Emphases mine) (Smith, 1985; 197).

The metaphors we use to describe and interpret our world are important since they structure the way we perceive it. Just as metaphors can expand our horizons and can create new realms of experience, they can narrow our choices, if we limit ourselves to the ones used by positivistic science or to those of any other single way of looking at the world. The use of the so-called "scientific method" in the social sciences illustrates how

emphasis of one single way of knowing can limit understanding and the creation of new possibilities. Within the positivistic sciences or the objectivist tradition of research, the researcher's task is still seen as identifying laws which govern human events by utilizing the scientific method in a personally detached manner. Marshall and Barritt suggest that language within the objectivist tradition is used only to report and not to create. "Research [in the objectivist tradition is] not a rhetorical process of argumentation, but rather a scientific one of method. The writing of research [then becomes] ancillary to the actual work of finding out." (Marshall and Barritt, 1990; 605).

In addition to considering the implications of the metaphors we live by and recognizing that the relative value of metaphors cannot be quantified or assessed "objectively" to be right of wrong, we need to decide whether the goal of research in the human sciences is to measure and control human behavior or to understand it. Knowledge and human interests are interwoven as reflected in the choice of methods and the ends to which such methods are put (Habermas, 1971). The idea that there is a world out there that eventually can be totally analyzed, predicted, and controlled -- the world of positivistic science -- is frightening to me. Aside from the question whether it is even remotely possible, imagine for a moment that we lived in a world in which there was little uncertainty, in which we could predict the future, a world without doubt and surprises, a world as a three-dimensional clock that has been totally analyzed and can be manipulated and controlled in any desirable direction, and ask yourself: "What would life be like under those circumstances?" "Who would be the ones in control and who would be the ones under control?" "Who determines in what direction to go?"

Unless we reflect on the ends to be served by science, we risk that prediction and control and the methods that come with it might exclude other ends, such as improved understanding among people, the release of human potential (Susman and Evered, 1978), the forming of a "sustainable" relationship with our surroundings and to generate new possibilities of experience.

Table 1.1.
Epistemology of Dominant Inquiry Models in the Social Sciences
(after Van Manen, 1975; 5)

type of system & science	pretheoretical category	unit of analysis	validation procedure	telic mode or aim	meaning of explanation	general theoretical orientation & social theories	practical significance or applicative significance
action system: interpretive science	intentional behavior	experiential meanings of purposes, motives, etc.	constructing inter-subjectively shared understandings	sense-making	establishing "resonance" or "striking a responsive chord" by clarifying motives, authentic experiences, common meanings	**action theory:** hermeneutics, language analysis, ethnomethodology, phenomenology, analytical sociology	**humanistic:** acquiring insights into human experiences, facilitating communication, enabling meaningful interactions, seeking a continuity of cultural traditions, providing commonalities of understanding
pseudo-natural system: empirical-analytic science	observable behavior	observable and inferrable behavior	corroborative empirical observation	nomological explanation, prediction and control	causal, functional, or hypothe-tico deductive arguments, involving natural laws or scientific generalizations	**behavioral theory:** S-R and S-O-R theories of learning, cybernetics, systems theory, dialectical materialism, structural functionalism (?)	**technical:** behavior modification, human engineering, systems analysis applied to cultural, social and institutional systems, e.g. in instructional design and programming
moral/ therapeutic system: critical science	disturbed and distorted communicative/ instrumental behavior	values, communications, and instrumental actions	practical discourse	process of enlightenment and emancipation	tracing back to underlying hidden or unreflected aspects of social life	**critical theory:** neo-Marxism, psycho-analysis, critical theory, analytical ethnomethodology (?)	**emancipatory:** humanization, social change, therapy

Table I summarizes the world views, metaphors, aims and practical significance of three types of epistemology. Considering the arguments put forward in this position statement, I find myself most comfortable with the research traditions which lie in the, what Van Manen refers to as the critical and interpretive sciences.

After reflecting on my research philosophy I was confronted with the task of constructing a research approach that would be congruent with this philosophy. I had to look for a way of doing research that; a) does not reduce people to clusters of interacting variables and does not impede communication, reducing human beings to the status of things, b) is more than a data-collecting activity, in that it actively seeks to understand as well as to improve the school and its community, and c) does not focus on finding causality, generating generalizable results and predicting the future with statistical accuracy. In addition, I believe that environmental education research should have a pedagogical end in the sense that the participants somehow benefit from the research. Hence, research should not just be an attempt to learn <u>about</u> people, but to come to know <u>with</u> them the reality which challenges them (Beekman, 1984). With that in mind I believe that research can help in producing knowledge with emancipatory relevance that can promote the autonomy of the individual and the solidarity of the entire community.

1.4. Research Approach

I will now describe a way of coming to understand people and the metaphors they live by which is compatible to the position taken in the previous section. The research approach I used has elements of both action research as a methodology and phenomenology as a way to come to understand the everyday world of experience through language.[6] Both the tradition of action research and phenomenology use -- although not

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[6] Spiegelberg describes phenomenology as a philosophical movement whose primary objective is the direct investigation and description of phenomena as consciously experienced, without theories about their causal explanation and as free as possible from unexamined preconceptions and presuppositions. (Spiegelberg, 1975; 3).

exclusively -- qualitative research methods such as field research, descriptive research, and ethnography in which the researcher takes the role of observer, interpreter and/or participant. Research here becomes more than a data-collecting activity, in that it actively seeks to understand as well as to improve the school and its community through simultaneous, planning action and reflection.

In researching education within these traditions, one continuously tries to make sense of an ongoing process that may go in many directions--making initial observations, developing tentative general conclusions that suggest particular types of further observations, making those observations and thereby revising one's conclusions, and so forth. This "research spiral" is very similar to the spiral of action and reflection the learner ideally follows throughout an AR&CPS project (Lewin, 1946; Kemmis, 1980; Wals et al., 1990).

The emphasis in this kind of research shifts from finding or proving causality in order to generate a theory of human behavior, to documenting and describing, using, in addition to diagnostic instruments, one's own observations and those of teachers and students; interpreting these with all involved participants; relating the results with the foundations, goals and objectives of (environmental) education; and feeding back the results to the participants, and others interested in the improvement of education. Instead of putting emphasis on the kinds of changes that occur in the learner as a result of an (environmental) education project, I am more interested in finding out whether projects such as AR&CPS and the Rouge River Project on the one hand, and the structure of schooling on the other, provide for such change (Margadant-van Arcken, 1988b).

In my research I mainly looked at the way participants perceive, experience and define "nature," "environment," "environmental issues," and "environmental/social change" and how these perceptions, experiences and "definitions" relate to schooling in general and environmental education in particular. Experiencing here is more than the sum of feelings, encounters with the world and people's ideas. Experiencing also involves attaching meaning to various interactions with the world and the naming of these

encounters. The process of meaning making (or making sense) and naming of the world does not only involve cognitive conception as such, but also includes lived meanings and concepts manifested in people's actions and non-actions (Freire, 1986; 102).

In order to clarify this process, I will now introduce the notion of a world view. A world view can be seen as a construct that has historical, cultural, social and personal dimensions. Because it is historical it also is dynamic: it changes over time. A world view is the result of a person's interactions with the world in order to make sense of future encounters with the world. It has to do with the meaning people attach to words, the way people interpret their situation, the way people see their future, the way people interact with one another, the way people transform their world, that is, make it their own or the way people are deprived from making it their own, and the kind of self they accept for themselves. I also believe "perception of change" has to do with it.

In relation to this dissertation, a world view is thus more than just opinions and attitudes: it is the interpretive structure students have acquired to make sense of their schooling experience as well as their experiences outside of school. I did not begin the research with preconceived hypotheses to test but I did, as discussed earlier, have a general frame of reference to guide me. Human science can not exclude the knowledge of the inquirer from an understanding of how knowledge is generated. I too have a consciousness, world view and language that are a product of the history of ideas, social and cultural development and my individual encounters with the world. Much like reading a good novel, what we bring to the text [research] is as important as the text [research] itself (Smith, 1985). Phenomenological traditions acknowledge this by maintaining that the immediate subjective experience is the basis of knowledge. A challenge in phenomenological research is to either minimize the constraints of preconceptions, or to acknowledge one's preconceptions so that one allows another's experience to be communicated in a relatively undistorted fashion. Hence, I avoided putting the study in a theoretical framework prior to having actually started the study, but, instead, chose to reflect on my own guiding assumptions and metaphors, in order to obtain better insight in what I myself was bringing to the research setting and

participants, and to obtain an understanding of how that would influence the research experience itself.

This brings me to the the inevitable questions of: "How does one gain a better understanding of students' world views?" and "How or when does one know that one has realistically obtained it?" At the onset of the study I hoped to come to understand the students' world views in their richness, their significance, their transformations and their historical composition. Without actively participating as an actor -- as opposed to being an observer -- in the investigation obtaining this kind of understanding would be impossible. Furthermore, without being an active participant I did not think the study would lead to its pedagogical end, considering that "thematic investigation is justified only to the extent that it returns to the people what truly belongs to them; to the extent that it represents not an attempt to learn about the people, but to come to know with them the reality which challenges them." (Emphasis mine) (Beekman, 1984; 18-22).

Active participation here means being an integral part of the classroom events rather than being a distant observer.[7] In a phenomenological study this also means that one has to reflect on, make explicit, and temporarily put aside, any preconceived notions or theoretical assumptions in order to be able to look with an open eye at the everyday lifeworld the students inhabit (the way they respond to certain questions, the way they experience a particular project session; a class, lunch, social interactions, neighborhood, family, etc). Active participation also has the advantage that it allows for the researcher to build some trust between herself[8] and the participants. Building trust between myself and the students and teachers turned out to be crucial for

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7 Beekman, A.J. *Onderzoeker met hart en ziel;* Een pleidooi voor de lijfelijke aanwezigheid in het veld van onderzoek. Kollege bij zijn afscheid als hoogleraar in de theoretische pedagogiek en de algemene methodologie van het pedagogisch onderzoek aan de Rijksuniversiteit Utrecht, 1986. Active participation for me meant working with the students on assignments, responding to their questions, helping them with group-work, providing feedback to their journal writing, guiding them on community walks and fieldtrips, being an active listener, helping them find information resources for their topic of investigation, etc.

8 In order to avoid sexist language, I will randomly use male and female pronouns rather than opting for the more awkward constructions such as: (s)he, he or she, or him/herself. This is also an alternative to the usual disclaimer in the beginning of many books which choose to use the male pronoun exclusively. The latter approach, in my opinion, is a well intended apology for using sexists language, but in a subtle way continues to foster sexist stereotypes.

creating an atmosphere that allowed for communication to take place in a relatively undistorted fashion.[9]

During the research I not only engaged in participant observation, I also interviewed students and kept a research journal. During the AR&CPS projects the Detroit students also kept their own journals for reflecting on their learning experiences. I was given permission by the teachers and the students to use their journal entries for analysis and reflection as well. The majority of my research findings resulted from thirty forty-five to fifty-five minute interviews conducted with students from the four middle schools. The selection of the students needs to be discussed since it deviates from the conventional random sampling methods used in empirical analytical research traditions. In selecting participants for an ethnographic-phenomenological study, it is more important to have good informants who are capable of providing insightful information than it is to have a statistically representative group of people obtained through random sampling. Nevertheless, it is important to have some strategy in mind when selecting students in order to get the most out of relatively short interviews. The strategy I used was based upon Glaser and Strauss' "theoretical sampling design" which is a compromise between opportunistic or pragmatic sampling and probability sampling (Glaser and Strauss, 1967). Agar points out that this is an open sampling design in that you only stop interviewing informants when you feel you have reached the "theoretical saturation point." This is the point where patterns seem to repeat themselves and the interviews don't seem to reveal anything new anymore (Agar, 1980). Initially, I planned to do thirty-two interviews, but due to the frequent absence of two students I had selected with the teacher at one of the schools, I was unable to interview them. Rather than selecting two new students, I chose not to do so since I felt that I had reached the so-called "theoretical saturation" point.

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[9] Paulo Freire uses the process of coding and decoding in his conscientization method. Mary Cole in her *Summer in New York* used pictures in the black ghetto. One of her pictures showed a picture of a pile of garbage in the same street where the teacher and a group of teenagers were discussing the picture. One of the participants said at once: "I see a street in Africa or Latin America." "And why not in New York?" asked the teacher. "Because we are in the United States and that can't happen here."

With this strategy in mind, I first asked the teacher which students he considered to be representative of the class or certain groups within the class[10] and which students he thought were best able to express themselves verbally in a one-on-one interview. Furthermore, I wanted to interview as many boys as girls. All students were seventh-grade students age twelve or thirteen. A final, but crucial criterion, in the selection of students for the interviews was their own willingness to be interviewed. I would not have interviewed students who did not volunteer. Fortunately, none of the students selected declined the interview. If some would have declined that in itself could have pointed at a phenomenon worthwhile investigating.

Prior to commencing the main research, I had been working on AR&CPS projects in the Detroit schools during the period between the Fall of 1987 and the Summer of 1989. During this time I kept a research journal, interviewed eight seventh-graders as part of a pilot study (Wals, 1988) and studied the use and content of students' journals in AR&CPS projects (Wals, 1989). This information helped me in interpreting the findings.

In addition to the participant observations, keeping a research journal, and conducting interviews, I also used pictures that I thought illustrated students' everyday events or scenes that pose an implicit problematic situation. I showed the thirty students I interviewed four different color pictures (Appendix B) and asked them to tell me what they thought of each picture. For instance, I asked the students from all four schools to tell me what they thought of when I showed them a picture of a factory with smokestacks situated in a park-like landscape.

In phenomenological research there is a conscious effort to come to share participants' perspectives without using a theoretical model with which to judge these perspectives. The researcher therefore neither tests hypotheses nor uses observation matrices. This does not mean that "theory" does not

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[10] Paulo Freire uses the process of coding and decoding in his conscientization method. Mary Cole in her *Summer in New York* used pictures in the black ghetto. One of her pictures showed a picture of a pile of garbage in the same street where the teacher and a group of teenagers were discussing the picture. One of the participants said at once: "I see a street in Africa or Latin America." "And why not in New York?" asked the teacher. "Because we are in the United States and that can't happen here."

play a role. Preconceived ideas, sometimes prejudices, are temporarily put aside and existing theories come back into the picture after the data have been collected and analyzed. This is difficult, since one is often not aware of one's prejudices. In order for my research not to be naive, I had to analyze the pre-given or existing meaning structures embedded in myself in relation to the situation and context of the research. Beekman suggests that this implies reflection on:

> a) the actual situation as perceived by the researcher; making him/her aware of the prejudices s/he has;
> b) becoming aware of the usual privileged position one occupies in relation to the subjects in the field one wants to research; I in my comfortable office think about researching the homeless...
> c) becoming aware of the possible impact my judgments have on the research process, protocols and outcomes.
> d) realizing how much one's own judgments are dependent on the tradition (cultural history), of which one is part. (Beekman, 1989; 88).

These reflections would have to be made explicit for them to play their essential role in all phases of the research. During the actual field work, I tried to gather and describe as many impressions and experiences as possible. These impressions included: the way space and time were used, rituals, group interaction, the way new members of the group were dealt with, social networks and so forth. The impressions and experiences were reflected upon and written down in a research journal usually at the end of the day. Since it is impossible to capture and describe everything that happens during the day, the descriptions inevitably were a selection. The selection was based on the research questions I had in mind. These questions helped me focus my attention which subsequently led to sharper observations. Phenomenologists point out, however, that sometimes seemingly irrelevant events that somehow draw the researcher's attention either because they are striking or because of their frequent occurrence, may later turn out to be quite important (Bleeker and Mulderij, 1984). In a phenomenological research approach the researcher does not determine prior to the actual participant observation what data are relevant, but instead lets the experiences as a participant-observer determine the relevance of the data. At the same time he has a definite perspective as stated earlier. This perspective is not a fixed point, but rather a historical vantage point.

The interview transcripts, students' responses to the pictures, and journal reflections were analyzed and compared with the intention to discover some structure and coherency in the reflections. Usually experiences tended to repeat themselves with some variation, but after several rounds of interpreting, a deep-structure of common themes emerged. The writing process itself became the making sense of data which allowed for temporary themes, categories, or patterns to emerge. This was crucial for it prevented the research from running blindly into a dead-end street. The describing and temporary analysis of the data made it possible to refocus the research by looking at aspects that initially were thought to be irrelevant.

Once the themes emerged, they had to be brought together in meaningful, coherent and understood sentences (language). Determining these sentence structures always involves interpretation of the rough data, the generation of themes, and the choosing of the best descriptive metaphors. It is important to point out, however, that these interpretations and selections are not made in a vacuum but are bound to the lifeworld. The lifeworld determines the validity of the interpretations. The reader of the research report is likely to test the interpretations using his or her own experiences as a frame of reference -- parallel to the "reading of a good novel" analogy used earlier -- and is therefore able to give well founded critique. "Knowledge obtained through phenomenology is not subjective in the sense of opposite to objective, but is subjective in that it finds its origin in a 'subject' that is at the core of a world which is [partly] shared with other 'subjects'." (Margadant-van Arcken, 1988; 7).

An interpretation is not only tested against the experiences of the reader but also against the rough data themselves. When the researcher has to mold the data in order to make them fit into a category, she knows that she is on the wrong path. A category has to leave interpretation space. In other words, the research data had to fit in "naturally." Phenomenology holds that interpretations which show coherency of meaning become a descriptive theory and that the understood structure of sentences describing that theory make up scientific knowledge. In order to reach some form of inter-subjectivity and consensus with others, I had outside researchers read interview transcripts to discuss and modify the direction of the interviews,

during the interview stage. Furthermore, I asked the five dissertation committee members to comment on my interpretations during an early stage in the writing process.[11]

A next step in the research process was to put the descriptive theory in a broader framework in order to find "family related" patterns in the way children perceive and experience nature and their environment; the way these perceptions and experiences affect the way they perceive their own role in resolving environmental issues; the way environmental education in particular and education in general can build upon these perceptions. In this phase the findings were confronted with existing theories and research results. The result of these confrontations was a mixture of the confirming, specifying, refining, putting in perspective and rejecting of existing theories.

Without getting into the debate about whether descriptive research concerned with non-randomly selected particulars can be generalized or transferred to other situations, I will say the following. This dissertation tries to tell several stories that have to do with students, schools, communities and young adolescents' thinking about nature and environmental issues. The phenomena or themes are described in such a way that readers hopefully can visualize the scene, can understand the meanings ascribed to certain phenomena by the students, and can follow the interpretations of these phenomena and their relevance to environmental education, as seen through the eyes of the researcher. Every student, school or community displays not only itself, but also features it has in common with other students, schools and communities. In the words of Eisner, "every particular is also a sample of a larger class. In this sense, what has been learned about a particular can have relevance for the class to which it belongs. The theme embedded in the particular situation, extends beyond the situation itself." (Eisner, 1991; 103).

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[11] The original dissertation committee included Professor Richard Stoffle who also provided feedback to a sample of the interview transcripts in an early stage of the research. In addition to acknowledging him, I would like to extend my gratitude to Drs. Dirk Huitzing and Dr. Marjan Margadant-van Arcken for helping me in developing the guiding questions used in the interviews, and to committee members Ton Beekman and Bill Stapp for providing feedback to earlier drafts of this dissertation.

Hence, what one learns about one student's or a small group of students' thinking about environmental issues, for instance, can raise one's consciousness of features that might be found among other students. However, this study does not claim that other students will share identical or even similar features but rather that these are features one might look for among other students. Philosophically speaking, one cannot generalize from one situation to another when the situations are identical, only when they are different. As Eisner points out, skills, images, ideas, perceptions and experiences are never identical; some features of the situations always differ. It is therefore better to speak of the transfer of generalizable features to a different context.

Finally, the results of the study needed to be communicated with the teachers of the schools who participated in the study. This needs to be done for otherwise the study would not have a pedagogical end.[12] The results hopefully will lead to adjustments in the AR&CPS project and the Rouge River project that will be benefit the participating students. The feedback phase of the research will require that I go back to the schools or at least find a way of sharing the results with the school communities involved. The product as it appears in this dissertation should not be seen as the final product, but as an intermediate stage in gaining better understanding, while acknowledging that it is impossible, perhaps even undesirable, to obtain complete and permanent understanding.

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[12] William Ayers points out that personal in-depth interviews, self-reflection and life-history writing can be a powerful, transformative experience because it is in a small way an act of self-discovery and self-creation (Ayers, 1990). Through this act of self-creation or self-discovery, participants (including the main researcher) in a phenomenologically oriented study can, in the words of Spiegelberg, obtain a widened sense of the world and a deepened sense of themselves (Spiegelberg, 1975). This transformative experience I view to be part of the pedagogical end of this study.

In summary, the research can be divided into four interrelated and overlapping phases (see also Figure 1.1.):

Phase I: **Collecting data** through participant observation and the interviewing of students and teachers in the field.

Activities: Interviewing, participating, observing, journal writing, reflecting on students' writings and other expressions with students and teachers, getting to know the school, the neighborhood, building a relationship and trust.

Phase II: **Developing categories/interpretive structures** that capture the rough data.

Activities: Analyzing and interpreting the data, discussions with co-readers, ordering the rough data into "natural" categories/themes. Dialectical relating of the parts to the whole, re-conceptualizing when incongruence takes place.

Phase III: **Developing a descriptive framework** by bringing together the categories in order to build a kind of theory, if you will, and confronting this framework with existing theories and research results.

Activities: Synthesizing the categories into coherent understood sentence structures in order to generate theoretical implications grounded in possibilities for action. Reading of similar studies, comparing the findings, confronting the findings with existing theories of learning. Formulating conclusions and recommendations.

Phase IV: **Documenting and communicating findings** and results. The actual writing of the dissertation and sharing the findings and results with the schools that participated in the study, people involved with AR&CPS and the Rouge River project, and the broader environmental education community.

Activities: The actual writing of the chapters and discussing them with the committee. Feedback of findings and results to the participants of the study. Proposals for adjustments of the AR&CPS project and the Rouge River project. Writing of spin-off articles.

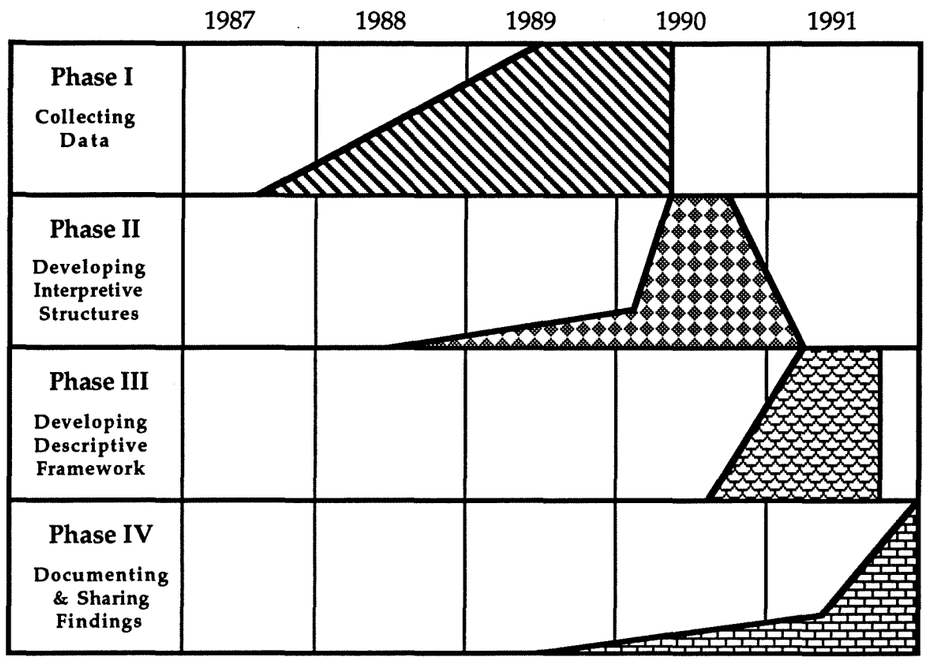


Figure 1.1. Research Phases and Time-line

CHAPTER II
THE SCHOOLS AND THEIR COMMUNITIES

The research took place in four middle schools in three communities: Forest Grove and Barnsley,[1] both located in the northern Detroit metropolitan area, and the city of Detroit itself. The schools were selected based upon their participation in the Rouge River project and/or the Action Research and Community Problems Solving (AR&CPS) project (see Chapter I). I had personally been involved in the facilitation of these two University of Michigan-guided environmental education programs and therefore was already familiar in varying degrees with the four schools, some of the teachers and the communities. Two years of intensive involvement in an attempt to develop AR&CPS in the two Detroit schools had made me particularly familiar with those two schools and their communities (Wals, 1989).

In describing my research rationale earlier, I pointed out that one of the driving forces behind this study emerged from the heightened awareness, on my part, of the seemingly disproportionate amount of environmental education schools outside of impoverished urban environments seem to receive. Schools in predominantly white middle-class communities appear to pay more attention to environmental education than schools in predominantly African-American working and 'not-working' class communities -- even though pollution levels in real terms are generally a far bigger health concern in the city. The question arose whether this is a result of different community values and concerns or of the extremely challenging situation in which teachers and students in the city schools find themselves. Perhaps environmental issues are low on the agenda in communities where

[1] The names of the schools have been changed. To safeguard anonymity of the two suburban schools, I have changed the names of the suburbs as well.

unemployment, crack and drive-by shootings are a part of everyday life. Perhaps there is just not enough money in city budgets or school budgets to address environmental issues in the community or in their schools. Perhaps teachers, given the every-day changing classroom situation and the apparent need to maintain control over the classroom, are limited to teaching the basics of reading, writing and arithmetic. Surviving as a teacher, and teaching those skills is in itself challenging enough. Adding new elements to the curriculum such as environmental education, conflict management and drug education, could overwhelm already stressed teachers. Perhaps the students, to whom avoiding violence is an integral part of their lives and who grow up in crime-ridden neighborhoods often without any parental guidance, are too distracted to pay attention to what goes own in the classroom. Perhaps school, to them, is a safe haven where they can relax and be uninhibited without having to pay the price for it.

These were some of my thoughts which helped shape the study. To say that the kind of community and family support system children grow up in will influence their social and moral development as well as their personal values and outlook on life is to open an already open door. To say that the kind of community and family support system children grow up in will affect their thinking about pollution and environmental issues, and that this thinking is closely tied, perhaps inseparable, from things like social and moral development, personal values and outlook on life is to enter relatively unknown terrain. Clearly, without having some understanding of the school, the neighborhood, the teachers, the students, and without looking at the evolution of the community from a historical perspective, it would be difficult to make any statement about the relationship alluded to above. It is for that reason that I include a description of the communities and the schools. It is also for that reason that asked the children about their neighborhood, school and their outlook on the future. Admittedly, I am, as a result of my frequent visits to the Detroit schools and the compassion I developed for the teachers and students in those schools, more detailed in my observations and description of their world than I am in my account of the world of the students in the Forest Grove and Barnsley schools. Depending on the interests and concerns of the reader, this could be regarded as a weakness, in that I did not pay equal attention to all the schools involved in

the study, or as a strength, in that the decision to pay more attention to, what I regard to be, the disadvantaged communities, is appropriate considering the discrepancies between the different worlds I referred to earlier. As a result, the descriptions of the Forest Grove and Barnsley communities and schools are more factual and less descriptive, while the descriptions of the Detroit communities and schools are richer and largely based upon personal experience and anecdotal accounts of those who are part of the community.

2.1. Colby Middle School, Barnsley

Barnsley is a suburb located approximately fifteen miles North of Detroit. Its population is socio-economically diverse in that it consists of working-class, middle-class as well as upper-middle-class families, with middle-class families in the majority. The community is predominantly white. In the sixties and seventies, many of the families now living in Barnsley moved from the city of Detroit to Barnsley to escape racial tension, and for fear of devaluation of housing prices and a reduction of quality of life, in light of the shifting of the racial balance between whites and African-Americans. Barnsley, like Forest Grove, to be discussed hereafter, and many other Detroit suburbs, experienced rapid growth as a result of the massive white flight from the city of Detroit. Most of the working people in Barnsley work either at home or in a suburban business or industry which, in general, followed the same migration pattern.

When driving through Barnsley, one might notice a charming and seemingly thriving downtown area with small fashion boutiques, bakeries, and other small shops. Outside of the downtown area there are some broad commercial streets, sometimes up to eight lanes wide, with heavy traffic during daytime, usually bordered by gas stations, office buildings and strip malls. When turning into a residential area, one can find a mixture of apartment buildings, low to middle-income housing with small yards and a garage facing the alley, as well as expensive colonial style homes built on double or triple lots.

The streets of Barnsley generally have lots of trees, and people seem to value their well-kept yards. Like many communities these days, Barnsley has a recycling center which can barely handle the amount of recycleables it receives. The Rouge River forms the only non-linear division line that runs through town, and along with a number of parks, represents the presence of nature in the community. Barnsley seems to fit the stereotypical image of life in suburban America. This image not only includes broad lawns, two car garages, Little League baseball, the abundant presence of patriotic symbols (flags and yellow ribbons commemorating the Gulf War which took place in the months after the interviews), shopping malls and drive-through banks, but also; social problems standing in sharp contrast with the harmonious appearance of the community, including, elements of poverty such as an occasional homeless person on the street, drug addiction, divorced parents, drunk driving, teenage pregnancy and suicide. Although seemingly worry free from the outside, Barnsley too has its problems and is not immune from the issues that are generally associated with life in the big city, all be they of a different magnitude.

Colby middle school is one of four Barnsley's public middle schools. The average student population is about 350 students and the curriculum covers grades six, seven and eight. The school consists of a two flat building. Classrooms, offices, cafeteria, and media center are attached to a square hallway that separates the rooms from a courtyard that lies in the center of the building. The courtyard is used as a place where, weather provided, students can spend some time outside during lunch hour. It has been landscaped as a green, park-like area with benches that can be observed through the corridor windows. Its presence gave me a sense of peace and relaxation and may have a similar effect on students and faculty.

The classrooms are much like any classroom: a teacher-centered classroom set up with all chairs facing the teacher's desk and the black-board, little window space facing the outside world to prevent the students from becoming distracted, posters depicting scenes that have some relevance to the subject matter taught in the room, and closets in which equipment is stored for certain lessons. Attached to the classroom is usually a private area for the teachers. Walking through the school while classes are in session reveals that

there is little talk in the classrooms. The teachers appear to dominate and control what goes on. The relative silence breaks at the sound of the bell, when "en masse" students leave their chairs to channel through the corridor to lunch or their next class.

Table 2.1. Mission Statement Colby Middle School
(Source: insert student-parent handbook 1989-1990)

We, the members of the Colby educational community, believe that our educators, parents, and students must work cooperatively to ultimately prepare our students to become responsible, productive, and self-actualized members of our democratic society, prepared to face the challenges of the future.

Our most immediate objectives are to introduce new skills and enhance existing skills. The needs and values of the Colby community are specifically reflected in the emphasis on self-esteem, academics, and preparation for college. At Colby, students further develop skills in: self-discipline, ability to interact with others, self-esteem, standards by which to live, a knowledge base, and the ability to study and think effectively.

Professionals, parents, and students all contribute to the development of a safe, caring, and productive environment which develops self-respect, respect for others and a positive attitude for learning. These objectives are aimed toward making the transition to high school an exciting and rewarding experience.

Administrators, teachers, counselors, parents, and support personnel work systematically toward thoroughly understanding and meeting the individual needs of each student. To accomplish this, our educators cooperatively plan a variety of methods and techniques to help each student reach his/her full potential: philosophically, intellectually, physically, emotionally, and socially. Enrichment activities provide career exploration, cultural and recreational experiences, all of which assist in furthering our goal: TO DEVELOP SELF-ACTUALIZED MEMBERS OF THE AMERICAN SOCIETY.

The school, like most middle schools, provides for the transition between elementary and high school education. According to the 1989-1990 student-parent handbook, the Barnsley middle schools are designed to "meet the changing needs of the emerging adolescent" (Barnsley Public schools, 1989). The school's philosophy is stated in a mission statement which is not unlike that of the other schools which participated in the research (see Table 2.1.).

The mission statement in Table 2.1. is similar to those of the other schools involved in this study, in that those schools too use value-laden adjectives such as "democratic," "productive," "responsible," and "self-actualized," define personal qualities and characteristics in terms of skills e.g. "self-esteem," "self-discipline," and "ability to interact with others," and, finally, consider the current society a-critically as a desirable arrangement worth maintaining (e.g. a curriculum reflecting the needs and values of the Colby community, developing self-actualized members of THE American society (emphasis mine)). Furthermore, it is not clear what is actually meant by concepts such as self-actualization -- a concept borrowed from Maslow -- neither from the statement itself, nor from the student-teacher handbook or the Barnsley middle schools 1989-1990 information reader. As is common with mission statements, the goals appear lofty and agreeable, but remain meaningless unless one examines their implications for classroom life as well as the way they are interpreted by the teachers.

A look at the curriculum shows that, unlike subjects such as; consumerism (part of home economics), personal money management, and the more general teaching subjects, environmental studies and nature studies, are not included in the curriculum as separate subjects, nor do environmental education objectives as defined by, for instance, Hungerford and his colleagues appear in the school's education objectives (Hungerford, et al. 1980). The extent to which the latter subjects and objectives are addressed, depends on the individual interests of the teacher. Colby middle school does have a few teachers who, as part of their science classes, teach about the environment and engage students in occasional field trips to nature areas. The school does not have an extra-curricular ecology club, environmental studies club or recycling club, but does have a variety of other clubs including an art club, ski club, international club, drama club, science club and game club.

From the limited experiences I had with the school, some of the administrators, including the principal, and the teacher who assisted me with the selection of the students, I got the impression that Colby middle school is a well organized and well-run school to which parents comfortably send their

children. The science teacher who assisted me during the research appeared to be highly appreciated by the students and school administration. He is known for his interest in environmental science-related educational activities. The latter is illustrated by the fact that for the last four years, he participated with his classes in the Rouge River Interactive Water Quality Monitoring Program for schools (Mitchell and Stapp, 1991). The way the school handled my request to conduct a study with some of the seventh grade students illustrates that the school is well organized. After contacting the teacher, whom I knew from past projects, a meeting was set up with the principal to discuss the research and to find ways to select students to be interviewed. Subsequently, a letter was prepared to send to the parents for their approval (Appendix A), a room where the interviews could take place was reserved weeks ahead, and finally, the principal requested that the research findings be shared with the school community. These procedures only seem logical, but they were not thought of or demanded by any of the other schools and only partially followed upon my own request.

2.2. Royal Oak School, Forest Grove

Royal Oak school is a private school which has three campuses: a main campus for the middle & upper schools, a town campus for the junior schools (grades 3-5) and a Pine road campus for the pre-K through second grade students. In 1989-90, the school had a total enrollment of 1,224 with, interestingly enough, about 63% male and 37% female students. I do not know whether this ratio is a reflection of the school's admission procedure or of the ratio of male and female applications. The school has all the elements of most private schools including uniforms throughout most of the grades and a strict dress code, tough admission policies and high tuition rates. To be admitted to the middle school, for instance, a student would have to leave a good impression during a personal admission interview, would have to have a positive recommendation from a teacher at her former school, would have to score high on a variety of standardized tests (which may include I.Q.-test, reading comprehension, vocabulary, and mathematics computation), and

would have to pay $9,050 tuition for a school year.[2] The school does offer a few scholarships to those who are talented academically and/or athletically, but cannot afford to attend.

On a public relations handout, used for recruiting new students, the school prides itself for a number of achievements using a variety of statistics including: "Mean average SAT score for Class of '89; 610 mathematics and 560 verbal," "13% of Class of '90 named National Merit Semi-finalists," "90% of '89 Advanced Placement examinations merited grade 3 or better," "17 Phi Beta Kappa Certificates of Achievement," "4 in top 1500 of National Mathematics Examination." The list of academic achievements, complemented with a number of sports championships, is long and reflects the school's emphasis on achievement and competition. Royal Oak school prepares students for college, particularly a college that ranks high academically on a national basis. To complement its emphasis on academic achievement, the school has come up with what the headmaster refers to as a "cultural enrichment package" which includes K-12 art and music taught by specialists, requires sophomore attendance at four theater performances, and requires juniors and seniors to attend two performances of the Detroit Symphony Orchestra.

So on paper we have a successful private school with talented faculty and well-disciplined students who work towards academic excellence and along the way learn to appreciate subjects that are not addressed in what the headmaster refers to as the "traditional and more measurable academic disciplines."

A personal account of my first visit to the school may provide useful in building an image of the school. When I first visited Royal Oak's middle & Upper school campus, located in Forest Grove, I noticed that the building was located in a neighborhood with beautiful villas with broad lawns surrounded by mature trees. The Forest Grove area can be described as a park community in that there are lots of wooded areas and no commercial strip-malls. Not for

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[2] Based upon the 1989-90 admission procedures/tuition sheet. Some financial support in the form of scholarships is available.

a moment did I think that I was in a metropolitan area. The school building is located away from the main road on the bank of the Rouge river and on the edge of a wooded area. The sports fields separate the one-story school building from the busy main road.

A sign "Private Property, No Trespassing" welcomes visitors as well as a "monument" listing all the school sports trophies of the eighties. There are two parking lots; one for faculty and one for students. I cannot help but notice some awfully nice looking cars parked in the student parking lot. I do not see any bikes parked near the building; most students take a school bus, drive their car or are dropped of by a parent. I realize that some of the students come from far away to attend the school. At the same time I realize that riding your bike to school can be very dangerous given that the main roads on the north and east side of the school are very busy, while bike paths do not exist.

After parking in the faculty parking lot, I walk into the building unnoticed, armed with a tie. Nobody stops me or questions my presence which stands in sharp contrast with the two Detroit schools where I either was greeted by a locked school door or by a security guard before I was issued a visitor pass. The upperclass males must wear a tie, upperclass females must wear a skirt and a blouse, while underclass students all wear uniforms. The dress code is strictly reinforced. The daily bulletin reminds faculty "to make sure sweaters are worn, shirts and blouses are tucked in." I walk to the main office to ask for directions to the middle school section of the building where I will be meeting the biology teacher who expressed interest in participating in my research. I receive the directions and again am surprised that nobody asks me who I am and why I am here. My hunch is that I blend in nicely with the upperclass crowd. The ties and other dress codes make me look like a senior student. Faculty members have no reason to believe that I am not a student, I figured.

In the hallways I notice posters that seem intended to raise students' environmental awareness: "Save a tree: recycle!" I also notice posters of African-American role models on the walls, similar to the ones I had seen in the two Detroit schools. I do notice some African-American students in the

hallways, and I am told later that day that the school does make an effort to attract African-American students to the predominantly white school. The hallways are clean and pleasant; the walls are nicely painted and decorated, and the students' lockers blend in nicely.

Since the school is in between class sessions, hundreds of students are finding their way to their next destination. The noise level is quite high and there does not seem to be a pattern in the students' movements. This chaotic scene stands in sharp contrast to the students' dress code. It continues to amaze me how at the sound of the bell virtually all students disappear from the hallways in less than a minute. Apparently there is a pattern after all. I notice that despite the dress-code some students do manage to maintain their identity. For example, some of the male students have their shirt tails hanging out of their pants, wear their tie loosely with the upper button of their shirt opened, wear an earing or have an unconventional hairdo.

I reach the middle school section of the building. The section is interesting from an architectural point of view in that it has a circular shape. The classrooms, administrative office, faculty lounge and kitchen are located at the periphery of the circle, while the core of the circle is used plenary school lunches, announcements, exhibitions and theater plays. The central space has carpeted floors and round tables at which the students are about to have lunch. A faculty member, using a microphone, instructs the students to sit down, makes some announcements, and then ends with a short prayer along the lines of: *"May we find the beauty of the earth, so we can find the beauty in ourselves, amen."* This prayer is to complement the "thought for the day" which is posted in the daily bulletin: *"When you feel rejected, start accepting yourself, and then go out and accept someone."* I wonder what the students think of these thoughts, if they think of them at all. After the short prayer the faculty member calls out: "eighth grade!" which apparently is the signal for all the eighth graders, the oldest students in the middle school, to get up and rush to the kitchen to get their lunch.

I had already met the teacher who agreed to help me with my research on several occasions so it did not take long for us to re-acquaint ourselves. His classroom is truly a biology classroom: a variety of animals including fish,

turtles and snakes can be found in the room, many posters of wildlife hang on the walls and the tables can be easily reorganized for group activities. The students do not appear to pay much attention to the video that is being displayed. They seem hyperactive and appear to enjoy the infamous post-lunch sugar-high teachers seem to dread so much. The teacher introduces me to the class and I add a few words to let them know why I am visiting the school. I am amazed by how easily the students accept my presence and continue their classroom behavior as if I am not there. During the classroom period, the teacher takes time to talk with me, occasionally shouting something to the students when the noise level gets too high, meanwhile the video is still playing. . . Although I appreciate the teacher's willingness and eagerness to talk with me about the research, the Rouge River project of which he has been a part for several years, and other environmental education projects he is involved in (i.e. a bird house and bird identification project for the elderly), I feel bad about taking his time away from the students (although they don't seem to mind at all). We discuss the intention of the research, the selection of the students to be interviewed, the follow-up, and set a time-line.

The above description may reveal the bias I hold towards Royal Oak school as a private school. Even though I tried to be open-minded in approaching the school, I could not overcome my negative feelings towards private education, uniforms and sixteen, seventeen-year-olds driving to school in expensive cars. These feelings influence my description of the school. I myself grew up in The Netherlands where education is publicly funded and where a main principle is that all students should have access to any school --at least should not be discriminated against based upon income or socio-economic status. I also grew up with a general dislike for uniforms which I have come to see as a tool to minimize identity, to exercise authority, and, in schools, to underscore the power imbalance between teachers and students. This is not to say that Royal Oak school is not a good school. Obviously there are reasons for the uniforms and for being a private school which ultimately stem from the desire to provide students with the best education possible. In all fairness to the reader and the school, however, I feel it is appropriate to share my bias against the principle of private schools and uniforms, so that my descriptions can be viewed in their proper context.

The curriculum offered to the Royal Oak middle school students is impressive. The school distinguishes eight main subject areas. Some of the subjects listed in Table 2.2 are elective, others can only be chosen when a student is at an advanced level in a particular subject, but most are required for all students.

Table 2.2. Subject areas and their main topics taught at Royal Oak middle school.

Literature, Writing, Grammar, Vocabulary, Oral Presentations.
Foreign Language:
French, Latin, Spanish.
History:
Global Studies, European Studies, U.S. History.
Mathematics:
Mathematics (Honors, Advanced), Algebra, Geometry.
Science:
General Science, Chemistry (Honors).
Computer Studies:
Word Processing, Data Bases, Spreadsheets (integrated into English, History, Science), BASIC & LOGO Programming.
Art:
Painting, Design Basics, Printmaking, Watercolors, Drawing, Clay, Art History, Drawing, Sculpture.
Music:
Music History, Band/Orchestra/Chorus, Jazz History.
Physical Education:
PE classes daily, Interscholastic athletics, Health Fitness Evaluation.

Compared to the other middle schools in this study, Royal Oak offers more in the areas of foreign language, computer studies and art. A look at a computer classroom and some of the art classes, makes clear that the school's budget apparently allows for the purchasing of up-to-date equipment and materials. The size of the budget as well as the spending priorities -- against my expectation, teacher's salaries are quite low, often below those of the Detroit teachers -- make for a well-equipped and well-maintained school that offers a diverse curriculum.

As is the case with the other schools, Royal Oak does not offer environmental studies or environmental education. However, the teacher involved in this study is dedicated to environmental issues and has been active in supporting environmental education programs throughout the Detroit metropolitan area as well as on state level. In his classes he tries to integrate environmental issues in his teaching as much as possible and for several years he has involved his sixth grade students in the Rouge river project. The environmental concerns of some of the students in the school, particularly in the attached upper-school have led to several environmental awareness campaigns in the school as well as to a recycling drive. The school's location on the edge of a small forest area and on the bank of the, there, scenic Rouge River makes for an ideal outdoor education setting of which some of the science classes take advantage.

2.3. The Detroit Middle Schools

Both Detroit midlle schools in this study have been involved in University of Michigan-facilitated Action Research and Community Problem Solving projects. One of the school also participated in the Rouge River project. As a result of my involvement in these projects in the capacities of observer, participant and facilitator, I accumulated experiences that allow for a more detailed account of the schools and their neighborhoods than was the case in describing the two previous schools and their communities.

My own background as someone born, raised and educated in a western European country is different from those of the Barnsley and Forest Grove students, but still there are commonalties of experiences that I share with those students. This is hardly the case with the Detroit students and it took a long time for me to be able to begin to relate to the Detroit students and their teachers, and to begin to understand the school dynamics. In describing the two schools and their communities, I take the vantage point of a stranger in a strange land. I will use the impressions I have generated over a long period of time (Wals, 1988). Initially, I will lump the two schools together when describing the experience of visiting Detroit, but later I will address some of differences between the schools and their neighborhoods.

Driving into Detroit is a strange experience for somebody from the Netherlands and, from what I sense, also for my colleagues from Ann Arbor who, like myself, are white. Entering the city from I-96, the number of African-Americans steadily increases. Once off the highway, the broad streets that lead to Potham and Kedzie middle schools are depressing: many closed stores, lots of litter, and hardly any people on the street. Not that there aren't any people, they just don't walk; when they need to go somewhere they take the car. Unlike in other big U.S. cities, there is -- with the exception of some bus service on some of the major streets -- little public transportation. "Motown" used to have an electric train system running from Pontiac to downtown, but it had been "bought up" and removed by the car industry decades ago.

The way the streets have been laid out in Detroit not only causes you to think in squares, it also confronts you with two segregated worlds. On the one hand, there is the world of traffic, billboards, grocery stores, used cars, pre-school centers, fast food restaurants, and empty store fronts. This world is comprised of main streets consisting of up to eight lanes. Few people actually live in these streets. As soon as you leave these these main roads, you enter the residential world. I was struck by the beauty of some of these homes, particularly near Potham middle school: gorgeous brick houses with garages and broad lawns. In recognizing my own racist beliefs I first thought, "This looks like a middle class white neighborhood!"[3] It's hard to determine the racial make up of these neighborhoods by just driving through them since there are no people on the street. The first time we visited the school I thought, "Is this the inner-city Detroit I have been told and warned about?"

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[3] An anecdote told to me by an environmental writer for a Chicago newspaper may provide useful here. When the journalist attended a meeting on the greening of Chicago neighborhoods, one of the organizers showed two series of slides picturing two different neighborhoods. One neighborhood consisted of poorly kept homes, yellow lawns, few trees and much litter on the streets. The other neighborhood had nice looking Victorian style homes, broad green lawns, lots of trees and clean streets. When asked what these neighborhoods had in common the audience was unable to mention anything. The organizer then replied himself: "Both communities are black communities. The difference is not white or black, but it's green."

There's a Dutch saying that applies here: "Schijn bedriegt." Freely translated, it implies that although something looks beautiful at the surface, it may be ugly once you get beyond the surface. Detroit is a city rich in cultural and ethnic diversity, but unfortunately burdened with a variety of problems that include drug abuse, street violence, one of the highest murder rates in the country. High school and junior high school drop-out rates are among the highest in the country (McAdoo, 1988), and infant mortality rates are comparable to those of developing countries (U.S. Bureau of the Census, 1985). Much of the financial community has moved to the suburbs along with most of Detroit's white population. During the last two decades the city has lost almost half of its population, and the mayor's office desperately tries to keep the population above the one million mark to secure the highest level of federal support.

The neighborhoods of the two Detroit schools that are a part of this study used to be all-white, predominantly Jewish and Catholic communities. Looking at some old school class photos I noticed that all the students were white. Today, all but a handful of students are African-American. The previous principal at Potham would vividly tell us about the past and how the neighborhood has changed. He had worked at the school for almost thirty years and witnessed the changes: the white people moving to the suburbs, the disappearing Jewish bakeries, the decline of real estate values, and the busing of the remaining white students to private schools. I once asked him how many of the teachers actually lived in this neighborhood. He could name only three. Many staff members, including himself, live in the suburbs and drive to the school. They temporarily leave their own world to go to work. One teacher told us that he really likes working in Potham middle school, but that he would never want to live in the school's neighborhood. His own children go to school in the suburb where he lives. Later I learned that there are only a few teachers at Potham and Kedzie middle school who send their own children to the school.

It struck me that the deeper you move into the city, the more you are urged to play lotto and drink alcohol. Every block seems to have its own Lotto tickets for sale. A TV commercial, broadcasted frequently in the time I was there, is telling: "In America we don't have kings, dukes or lords, we

have something far more democratic. It's called Super Lotto..." Just win the Lotto and you can escape to start a new life. The great thing about the Lotto is that everybody has a chance to win... I often found myself looking for white people on the street or in passing cars, and when I saw some I thought; "Gee, what are they doing here?" Especially during the first few weeks at the two Detroit schools I became aware of my own whiteness, a very odd feeling I had never experienced before.

On our initial visits to Potham the now-retired principal would open the (locked!) door for us and say: "Welcome to the University of Michigan!" while clapping his hands. What impression did that give the students and teachers at Potham -- a group of white university "experts" who know all that is right and wrong? Why are there no African-American students on the research team? One of the teachers said, "It's too bad that there aren't any black students in your group." Another teacher jokingly told us: "To the students, you all look the same." What do you tell them? "There are only a handful of African-American graduate students (some of whom are from abroad...) at the School of Natural Resources and they are more interested in other areas of study." Or, "The few African-American graduate students at the university tend to enroll in schools that will lead to better paying jobs." Or, "One of the reasons we are here is to bridge the gap between African-American inner-city schools and the University of Michigan, so that eventually more African-American students will enroll." Although all of these answers are appropriate we never addressed the issue.

I often felt that some of the teachers regarded us as missionaries trying to "save" others. I feared that the people at Potham and Kedzie middle school would see us as a group of white elitists coming to an African-American school to bring a promising approach to education. I don't regard myself as a missionary, yet the idea that people may perceive my presence in such a way made me uncomfortable. While doing my research at Kedzie middle school, one of the teachers in the teacher lounge asked me who I was. Tired from conducting several interviews, I told her briefly that I was doing research on students' perceptions of environmental issues. Her response left no doubt about her feelings towards outsiders coming to the school to do research: "I hate people like you who come here to use these kids to get a Ph.D. How is

that going to help these kids? You will get your degree while these kids will continue to live in misery."

Her reaction confirmed my missionary feeling and actually made it worse by adding the feeling of being a parasite. After talking to her in more detail about the research and the nature of the action research projects the University of Michigan had been involved in during the past year, suggesting a genuine commitment to the students and the school, the teacher apologized for her remarks. Although this made me feel a little better, I could not help but think that in essence she was right: even though I had committed myself to trying to work with teachers and students in developing a new approach to teaching and learning, and even though my research approach entailed interaction with faculty and students, as opposed to using an impersonal survey which basically allows for the researcher to stay at the university throughout the course of a study, I stood to benefit from the research far more than the students.

From talking to the senior staff members at the schools, returning to the same neighborhoods frequently during the course of two years, and a brief review of a literature on the development of cities in the United States during this century (Foner, 1970, McAdoo, 1988), it becomes clear that the inner-city environment is fluid and continuously changing. Not only were twenty years ago both schools virtually all white schools, whereas today they are almost entirely African-American, there are other changes that appear to have a bigger effect on classroom life. On an even shorter time scale, teachers point out that there is a tremendous mobility among the students in that they tend to move to different neighborhoods within the city (sometimes better, sometimes worse). At least two consequences are the result of these changes:

1) The culture of the community has changed dramatically in two decades, but the structure of the school has not changed accordingly. It is not within the scope of this dissertation to address the question whether it should, but I will say that it causes friction, particularly between the different teaching philosophies of the new faculty versus those of the old faculty who have witnessed the macro changes as well. For a good discussion of the kind of friction that can be found in many city schools, I refer to Lisa Delpit's articles

on the process-versus-skills debate in teaching reading and writing that often exists between progressive African-American educators and their colleagues (Delpit, 1986; 1988) and Thomas Kochman's work "Black and White; styles in conflict" (Kochman, 1981).

2) The school community is unstable. The make-up of a class changes almost on a weekly basis as a result of students moving or dropping out of school (see below). This makes teaching difficult and inhibits working in groups. It also makes learning difficult for those students who have to constantly adapt to a new situation.

Both schools are, physically at least, not much different from most other American middle schools: long hallways with endless rows of lockers, art and posters on the walls, teacher-centered classroom layout, little window space, huge parking lots, and a big school cafeteria and auditorium. There are, however, notable differences. For example, for security reasons, the doors leading into the school are locked during classes. Additionally, the schools have security guards to monitor students and keep out unwanted strangers. Keeping people out of the school building apparently is just as important as keeping people in school. Whenever we arrived we had to ring the door bell and somebody from the administrative office would open the door for us. One of the students told me that there were cameras in the hallway and metal detectors near the front door. I did see a camera, but I didn't see monitors in the office or a metal detector. Also, in order to go to the rest room I needed a key, and the rest room stalls had no doors. We were told that open stalls prevented students from locking up and taking drugs. Obviously, safety and security are major concerns in the schools.

Although both schools have a lot in common, there are also some notable differences. Potham middle school is located in a neighborhood that appears to be improving in that new businesses have come to the area and old businesses have improved their storefronts. The school seems to reflect these positive changes: newly painted walls, new equipment for the science classes and new administrators with ambitious goals to improve education. Potham's image is a very favorable one within the Detroit public school system and the school is often used as an example of an inner-city school that

appears to work. At one of my last visits I was told by the new principal that many parents from far-away neighborhoods try to enroll their children at Potham.

The story is different for Kedzie middle school. The school is located in one of the poorest areas of Detroit on a large field that extends over an area of five square city blocks. The parking lot consists of a large dirt road filled with potholes. The back of the school in particular looks depressing: barbed wire to keep burglars out, garbage everywhere, peeling paint on the window sills, and a huge smokestack towering high above the building. The neighborhood is not much different: many vacant lots, burned down houses, street potholes, broken windows, litter, and neglected parks and trees.

Even though the area and the school gave me the impression of a bunker in a war zone, I am told by the principal that the school is doing well and that parents who live near other schools would rather send their kids to Kedzie. The principal even told me that the neighborhood surrounding the school is really not that bad and that the students are hardly affected by the violence and crack problems that affect the city at large.

The teachers we worked with, however, provide a different picture. They speak of many broken-up-families, teen-pregnancies, discipline problems -- they claim that it gets worse every year -- low attendance rates, over half of the school's families receive some form of public assistance, increased violence among students, some of which is gang-related, etc. Many of the children in the school are dressed poorly and often wear the same clothes several days in a row. Some of the students we worked with looked unhealthy: pale, thin and tired. Although both schools suffer from these problems, they were more apparent at Kedzie middle school.

Despite all the distractions and concerns, both schools do the best they can in trying to teach the basic subjects of science, humanities, mathematics, history, arts, reading and writing. Some teachers have been working at the schools for more than twenty years and refuse to give in to the feeling that all is in vain. The added challenge to their work as teacher is that they have to play so many other roles: father or mother figure, counselor, disciplinarian

and/or policeman, to name a few. In many ways these schools have become the dumping ground of society's ills. Teachers and counselors are expected to educate about drug abuse, birth control, conflict management, and career planning -- topics that often require parental guidance, support and positive role models. There are even examples of school teachers and administrators in city schools who go beyond the call of duty by sometimes assuming the role of parent or by attempting to enable the students' parents to become responsible for raising their child (Louv, 1990).

Nonetheless, the Detroit schools that participated in this study try hard to be like any other school by having an athletic program of some sorts, organizing field trips when the budget allows it, having a student council, advance-placement classes, honor roles, good attendance awards, extra-curricular school clubs, parent-teacher meetings, and so forth. The schools appear to try to offset the negatives that seem to be dominating the students' lives. To some of the teachers and administrators, the school is a reflection of the neighborhood. The school to them is one of the few positive elements in the community, and often the *only* thing students can depend on in their life. In the words of a Philadelphia principal (Louv, 1990) who refers to her school as the heart of the community: "As long as the heart is still beating, the sick body has a chance to heal."

2.4. Summary and Conclusions

The four schools represent a range of different student populations, communities and physical locations. Socio-economically, the continuum stretches from the upper-class families who send their children to the private Royal Oak school, via the middle- and working-class families at Colby middle school to the working-class and "not-working" class families at Potham and Kedzie middle schools. The last mentioned school is located in one of the poorest neighborhoods of Detroit. Racially the continuum shifts from the virtually all-white schools in Barnsley and Forest Grove to the virtually all African-American schools in Detroit. Physically the school buildings and their locations differ as well. On the one extreme there is Royal Oak school which is located in a green suburban community on the edge of a forest area

and along the banks of the Rouge river, and on the other extreme there is Kedzie middle school which can be regarded as bunker in an urban war zone. The organizational structures and the curriculum of the schools appear to be the same, but the problems that infest the neighborhoods in the Detroit schools so acutely, almost force the school to focus on safety issues, and on teaching a double curriculum which in essence includes performing many tasks which ordinarily are considered to be the tasks of parents and/or guardians. Additionally, budget constraints and the apparent need to teach the basic subjects early, before students drop-out of school, make for a far more limited curriculum in the Detroit school to be taught with the minimum of equipment and materials. While the Barnsley and Forest Grove communities are relatively stable in that fewer people move and fewer students constantly switch schools or drop out, the two Detroit communities are constantly changing which has a direct impact on classroom teaching.

The four schools clearly represent different contexts, but this is not to say that they have nothing in common. None of the schools have adopted environmental themes to be part of their curriculum. In all schools the extent to which environmental issues are addressed in the classroom solely depends on the individual teacher. Nonetheless, all the schools have been involved in some kind of environmental education project: the schools in Barnsley and Forest Grove for twenty-one years, since the first earth day, and the Detroit schools during the last two years thanks to their participation in the Action Research & Community Problem Solving projects. Royal Oak school requires the students to follow a strict dress-code and to wear uniforms, the two Detroit schools also have some kind of dress-code, but for a different reason: to keep students from showing off their clothes and to stop the clothes race which is believed to encourage students to display gang colors, obtain drug money and to alter spending priorities.

In short, we have a mosaic of different contexts with overlapping elements which makes it difficult, if not impossible, to pinpoint any causal relationship between any one variable and possible differences and similarities among the students. The focus is on the kind of reality the students in this study construct, regardless of the experiences they share or do not share with each other, in the context in which their lives are embedded.

In keeping with the research tradition described in Chapter I, it is assumed that the context as a whole influences the way students interpret and make sense of their experiences and not any one element in particular.

Having described the context in which the students' lives take place, and only the more overt context that revealed itself to me as a researcher, I will now turn to the students' accounts of the realities that challenge them, before moving to their perceptions of and experiences with nature and environmental problems.

CHAPTER III

THE PARTICIPANTS[1]

"Life is made interesting by doing what you have to do. Don't get out of school for any dumb reason like to sell drugs 'cause selling drugs is not going to get you an education and without education you have nothing. Stay in school, stay off drugs, get a good education, and don't worry, be happy!" (Lashante, 13, a Detroit middle school student (CMS_F_7).

3.1. Introduction

Having described the four schools and their communities, I now turn to the main contributors to the study: the thirty seventh grade students who participated in the research. In the chapter on the research approach used in studying their perceptions of nature and environmental problems, I stated that the selection of the students was done pragmatically. With the help of the teachers, I looked for students who: a) would be representative for the class or groups within the class, in the eyes of the teacher, and b) would be able and willing to express themselves in a one-on-one interview. The argument for non-random sampling was that in a phenomenological study it is more important to have good informants who are capable of providing insightful information, than to have a statistically representative group.

As a result of this strategy, the interviewed students make up a diverse group on two levels. First, within each school and within each class there are is diversity in that there are boys and girls, top ranked and bottom ranked

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[1] Explanation of symbols used in the interview excerpts throughout this dissertation:

[	interruption
(.....)	unable to transcribe
(<word>)	unclear but assumed word
[.....]	own additions/interpretations
.....	pause
(LLL_F/M_N)	interview identifier: LLL = school identifier, F/M = male or female, N is interview number.

Please note that all names have been changed.

students,[2] as well as some differences in background. Second, at the inter-school level, there are also differences, mainly in socio-economic status, race/culture and physical surroundings. The challenge of writing a chapter on the students' outlook on life, the way they look at their neighborhoods, their family life, their expectations of the future and the way they see their role in affecting environmental issues will be to provide images that allow for this diversity to manifest itself in the reader. In order to do this I have chosen to create four *composite portraits* (Polakow, forthcoming, 1992) which best describe the range of students who are part of this study. This choice makes it possible to create images that, on the one hand allow for the generated themes --the result of feelings and ideas subgroups of students appear to share-- to emerge, and on the other hand make it possible to respect the diversity that exists among the students. Another advantage of creating these four portraits is that I am not bound by the four schools in describing the students. This is important since the themes and characterizations are not confined to one specific school, but often overlap, particularly when looking at the two Detroit schools and the two suburban schools separately.

In reading the descriptions, the following should be kept in mind:

a) Although the portraits have been created, the statements made about them and the quotes used are not fictional. The descriptions are intended to describe the reality that challenges the students. The aim is to sketch the students' reality as constructed by them as accurately as possible from my limited vantage point as an outsider.

b) The four realities described are by no means all realities that can be found among the students interviewed. The sketches do not describe all students, nor do they describe any one student in particular. The descriptions are a compromise to honor both the diversity and commonalties that exist between the students, at the expense of both. The value of the descriptions lies in portraying dimensions of the students lives in their richness, while allowing the themes to come through in a proper context.

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[2] Top ranked and bottom ranked in terms of academic performance as measured by standardized tests and as perceived by the teacher. Representatives from both ends of the scale were part of this study as a result of application of the opportunistic sampling strategy, bearing in mind that not all students who are 'top ranked' are able and willing to express themselves in a one on one interview, while not all 'bottom ranked' students are unable or unwilling to express themselves in a one on one interview.

3.2. The 'Children' of Potham and Kedzie Middle School in Detroit

3.2.1. Lashante: Don't Worry, Be Happy!

Lashante is a thirteen-year-old student who attends one of the Detroit public middle schools. She is heavy set, wears a nice purple silk blouse and smiles almost continually throughout the interview. Like many of the young women -- and young women they are, considering what they have already witnessed in their short lifetime -- she appears to value the opportunity to talk in private with an adult who is willing to listen to her stories. Lashante lives with her two younger sisters and her older half-brother in the Buffalo projects. Aware of the negative connotations of the word "projects," she immediately begins to tell me that life in her neighborhood isn't so bad:

> Lashante: "My neighborhood is a very nicely kept project." "My environment is like, well some people expect it to be bad, but it's not, it's good (in some ways). But sometimes in other ways the people [in some parts make it] a bad neighborhood, but it's really a nice neighborhood. On the one side, like on the other side, it's bad, it's very bad [whispering]." (CMS_F_7).

Lashante has always lived in the projects even though she has moved around. She used to live in what she calls the bad side of the projects which is on the other side of the street. Her mother was able to get a better-maintained apartment on the other side just recently. The part of the projects they live in now is better, according to Lashante, because:

> "there's not the shooting or no after night drinking and a lot of cursing, no loud music, no name calling, no fighting, and there is security patrolling the neighborhood, but it is not like that on the other side 'cause there's drugs dealing." "People are getting shot there and it's not right. Just a while ago a man got shot in the head four times over drugs and he didn't even have anything to do with it!" (CMS_F_7).

Even though they live in the better part of the neighborhood,[3] her mom is concerned about her safety. When Lashante returns from school on

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[3] In the interviews it became apparent that what many of the Detroit students saw as their neighborhood was their own block and at most one or two bordering blocks. When describing their block students tend to give a more favorable impression of their own block when comparing it with surrounding blocks. Whereas their block is relatively safe, the surrounding

her own, her mother is still at the technical college where she is a student herself. When she gets home, Lashante has to call her grand-mom and uncle to let them know that she arrived safely. Despite the unsafe environment, Lashante is able to play outside in the back yard and on the local playground, but her playing isn't the way I remember it:

Lashante: "There's a playground and we have fun, but sometimes some people ruin our fun by coming in and taking over and they start shooting and we have to go home. "As soon as I hear gun shots I run away, every body [runs away]." "Or else you get under these -- on the playground they have these things that are on the ground and they are round and you get inside and stay there until all gun shots [are over] and you hear nothing, then you get out and run home."
Arjen: "Does that scare you?"
Lashante: "It does, because bullets don't have any names." "And one might not be meant for me but it could get me. It scares me for sure." (CMS_F_7).

Lashante has a very concerned mother, uncle and grandmother who care about her and try to protect her. With the help of some friendly neighbors, they try to create a safe environment for Lashante and her sisters. Lashante has to keep the doors locked when she is home alone after returning from school. Sometimes a neighbor will come over to talk to her so that she is not alone. Her mother only lets her go outside when she herself is home. Furthermore, Lashante cannot see anyone without her mom's approval. Whenever she leaves the house, she has to tell her mom exactly where she is going, with whom and when she will be back. Nonetheless, like many of her female friends, she is afraid to walk alone on the street. She knows of girls who have been gang raped on a vacant lot, in an alley or in a crack house. She herself has been assaulted by boys. She has learned to avoid parks and certain streets, and has developed the skill of not drawing attention to herself when walking in public alone. Whenever possible she walks in a group. Her stories about rape are compelling:

Lashante: "Rape is happening a lot! Little boys will be ganging together raping girls. I think it's five-year-olds, twelve- and thirteen-year-olds [who] raped a thirteen-year-old girl. The two little boys probably didn't know what they were doing! And the thirteen-year-old tried to blame it on (society). A girl got raped out on Woodworth in the storage room and I heard about a baby, a man raping a baby and fluid got into her breast and she was having trouble breathing and, I don't know, maybe it isn't right, but if someone needs (to

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blocks usually are not. Their block is considered to be safe not because there is no danger, but because people care about you and they protect you with alarms and pistols... (Wals, 1989).

have sex) they should go get a hooker or something like that 'cause it's better to go to a prostitute than going out and raping somebody." (CMS_F_6).

As is the case with many of the Detroit students I interviewed, Lashante's father does not live at home with her. She does not have a good relationship with her father who, she believes, is a lot like her. Talking about her father is not easy for her, and she is bitter about his drug addiction and the things drugs have done to him:

Lashante: "Drugs changed my father. It changed him a lot. What made him get on drugs? I think because he had a good job in a steel company and the equipment fell on his leg and he couldn't work anymore and it wouldn't get any better. And his friend (.....) started with dope and then he changed to crack and then it just led to him stealing (....) from my mama, his mama, his sister. He was a nice person, you know, but the drugs changed him and you know how they change for a while and then they go back? He did that and when he changed he kept going back. Sometimes he was so hard up for money he used to use us and the kids would let him in the house and he would just steal stuff in front of our face! Now, I was younger then I am now. He can't do that in front of my face anymore 'cause I don't know what I'd do, but I won't let him take my stuff 'cause, you know, our VCR has been (stolen) already. He takes the VCRs from us and we just keep getting them over and over. He stole my mama's credit cards, steals money that we leave around the house." (CMS_F_6)

Arjen: "Do you blame your dad for that or drugs or both?"

Lashante: "Both, really both. My mama keeps telling me that I should forgive him. I could see him doing that [stealing], but not in my face while I'm there! And he is always saying he loves me, but if he loves me he couldn't do that in my face, not while I'm there!" (CMS_F_6) "Now I think he's on a guilt trip and trying to get back in my life, but I don't like him. I love my father, but like we two sort of awkward. We both (are) alike in a lot of ways, but our likeness is keeping us further apart and he does drugs and I just say; 'I don't want to have nothing to do with you using drugs'" (HMS_F_1).

Looking at the daily lives of the Detroit students, it is easy to understand their emphasis on drugs as the root of all evil. They all know a relative or relatives who are in one way or another involved in drugs. They all seem to know somebody who has been shot intentionally or randomly in a drug-related incident. They all seem affected by the need to identify with a group and to express their identity by wearing the 'right' clothes. They all are affected by the killings in their communities and many appear to have developed an 'eye for eye, tooth for tooth' mentality towards conflict resolution, partially as the result of what many students regard to be a failing justice system. They often have witnessed fights over trivial things escalate

into a shooting or stabbing. The temptation for students to get involved in the cycle of drugs, fashion and violence is tremendous. Several students described to me how some of their colleagues dropped out of school, only to return to show off hundred dollar bills, fashionable leather jackets and Nike shoes. The message they had was clear: "What are you doing in school? Why don't you join me and you can have all of this, too!"

Lashante tells me about the girls who are chasing boys for their money. Several of them get pregnant and have children they don't know how to take care of. She knows the 11-, 12- and 13-year-olds who are trying to get an abortion or have already had one. She has seen the young mothers take their kid to school. Often the students' own mother is not much older than thirty (McAdoo, 1988). During the interviews, many of the girls express their ideals, things to strive for in life, including becoming lawyers, writers, judges and even the President of the United States. What would becoming pregnant at age thirteen do to those dreams? Lashante and her female peers made me think about the possible impact overturning Roe versus Wade might have on these children:

Arjen: "What are the big problems, when you look at all those blocks in your neighborhood? What do you think?"
Lashante: "The drug pushers, the girls which we call (...)chasers. The girls who chase these guys for money mostly and then they (take it) and get beat up and then they blame it on the guys, and the police come looking for'm and things and stuff. People sometimes steal cars."
Arjen: "Okay, tell me more about those girls chasing money. Are there many of'm?"
Lashante: "Yeah, most of the time it's like these girls, they go out and get pregnant and stuff, start coming over there, talking junk to the guys." "These girls, they have these kids by these no-good guys" "Most of them can't take care of the babies. That's about the biggest problem; they have them, but they can't take care of them."(CMS_F_2).
Arjen: "Do you think that they wanted those babies in the first place?"
Lashante: "Most of them didn't, but they couldn't help it." (HMS_F_5).
Arjen: "What will happen to them?"
Lashante: "Well, sometimes, in most cases, the parents take care of them and that's sort of a burden on the parents: they taking care of you and your child. So that's not even right."(HMS_F_1).
Arjen: "Why do you think they have children?"
Lashante: "Boys trick'm and sometimes they just crazy. They're freaky. Do you know what girl freaky is?"(HMS_F_1).
Arjen: "I don't know. What do you mean by freaky?
Lashante: "They just like to have sex a lot and don't use protection and they just get pregnant and what can they say [do] unless they're in abortions. [But] abortions are illegal, so they just have to have the child." "My mother said

> if I got pregnant at an early age, she would definitely have to pay for an abortion 'cause she's not going to take care of a child." "..... I think that would be better 'cause I am 13 and I don't have a job and I don't want my mother to go through the emotions of having to get a second job and taking care of me and my child and my brother and sisters." "I think the child abuse has gotten worse because of the law against abortion. They won't let them have abortions so they have to have their kids and they don't want their kids so they just kill them when they get here, and child abuse is wrong but it's because of the law against abortion. Abortion is wrong too so I don't know..." "Once a child comes in the world they got to take care of'm and most mothers can't do that 'cause they are too young and they just leave'm somewhere on a door step or something like that or in a garbage can or they don't feed them and they let them dying."(HMS_F_1).

Lashante tells me about how she is resisting the temptation. Like several of the females I interviewed in the Detroit schools she is trying, with the help of a mother or a grandparent, to develop a morality that is higher than the one of easy money and instant gratification:

Lashante: "It's the wrong thing. It's the wrong way to go. I don't like to be around people that use drugs or have anything to do with the situation 'cause like they probably like to lure me into it; get me to use drugs and stuff like that. And I don't know, I am a strong person and I don't want to do that, but they will try to come up to me and ask me will I use drugs or take drugs or buy drugs, but that's the way I feel about it." "Most of the drugs is because of money. People sell drugs to get money and all this cockiness is all because of money and somebody has got to do something about the money 'cause that's where it really revolves around: money!" "A lot of people get shot over money and it's a quick way to die. If you keep yourself out of drugs and stay away from it, you have longer to live and everything." "I would rather wait until I finish college and get a good steady job before I go into all the designer jeans and everything. I'll get them now, but more so I can wait until I have my own job and everything, instead of going out and doing something that is wrong and [in which I] might end up dead and won't be able to enjoy what you have bought for yourself, but you can't enjoy it because you're lying in a grave."(HMS_F_1).

Drugs have a tremendous impact on Lashante's community. According to the students, virtually all the problems in Detroit neighborhoods are related to drugs. In the eyes of many students, drugs form the umbrella of all problems. The families of the students are all affected by drugs in one way or another. Even when I try to steer Lashante away from local issues, she returns to the drug problem in her community:

Arjen: "Moving away from the city or your neighborhood, looking at the world as a whole; what do you think are the major issues or problems in the world today?"

Lashante: "The major issues, to me there's only one problem: the drugs. If we get rid of the drugs and the drug pushers and the suppliers we could start fixing up what's been torn down. Because that's the main problem that's taking most of everyone's time. If we get that and get it to a steady pace where we could have a group for that [fighting drugs] and a group that's taking care of the environment... That's when we'll have a better world. As long as everybody [focuses first] on one thing - because it's too big for a group of, say, twenty hundred people or something like that. That means the problem is too big and it's getting out of control. If you get it to where it's in control then you can break up half of that group. The half can stay there and keep that at a steady pace and the other half can go fix something else that these drug people have torn down."(HMS_F_2).

Lashante points out that all her community's problems are related to drugs and that drugs take up most of the people's energy. It is not until the drug problem is alleviated when groups of people can begin improving the community. She also suggests that the community has to be focused and united, which brings her to another theme in her life: lack of unity in the African-American community. She alludes to this problem when I ask her whether she would move away from the city to escape all the problems she is facing, if she were given the chance:

Lashante: "[No, I wouldn't move away] because I am not too good to live where I always lived!! My mother was gonna move in a minute, but, see, I am not almighty, I am not gonna change my attitude. Never forget where you come from!" "It's not like I'm saying that I come from poverty and all that, but, you know, never forget. Don't try to be (someone else). That's the problem with most people with black people today. The whites, the Caucasians, they stay together, they don't, you know, kill each other and fight each other, like we do." "We can't even get along together. Like, just today, they can't stand in a room with each other, they have to fight. That's why we [have problems]; that's dumb!"(CMS_F_2).

Despite the situation she finds herself in, Lashante displays some loyalty and pride towards her heritage and community. She is not too proud to live where she does and, unlike her mother, does not feel the urge to leave her community as soon as she gets the chance. Nonetheless, Lashante shows ambivalence when she compares her situation with the situation of other people. When comparing her life with those of whites in the suburbs, she acknowledges that their lives are probably better, although, as she will reveal later, she seems to think that people in the suburbs have similar problems but are better at hiding them. When comparing her life with the lives of people in Africa, she seems to say that their lives are better, too:

Arjen: "Do you think the problems in like Africa are similar to the problems here or are they very different?"

Lashante: "I think in a way that Africa is better off than cities here in the United States because they don't have as much of drug problem. And they don't have as many killings. Now there might be food problems, but at least they're not being killed off. They are being helped. It's like we're just sitting and waiting for someone to do something, everybody is waiting for somebody to do something. No-one is doing anything. But there [in Africa] there is help going on. We don't have any help...."(HMS_F_2).

Even when comparing her life with the lives of African-Americans in times of slavery, Lashante displays some ambivalence. The following dialogue reveals her sense of history, her awareness of how the past is still alive in today's world, and her acute awareness of racism. Again, I choose to let the students speak for themselves:

Arjen: "Do you think life 200 years ago was better than it is now?"

Lashante: "Except for slavery, yes. There wasn't as much killing, you know, wars and all this commotion that's going on in the world now, back then."(HMS_F_1).

Arjen: "So you think that except for slavery it was a better world?"

Lashante: [nods yes.]

Arjen: "Do you think - this is a weird question - when you look at the inner city, you know, a lot of killings going on, and you look back at slavery and you could choose: Where would choose to live? What time?"

Lashante: "I think now. See, back in slavery if I was a slave back then I had to work no matter what. See, if your mother was white and your father was black, back then, you was a free slave already because your mother was white, but if you were somebody like my color you got to worry unless you had a real good owner that was real nice and let you buy your freedom or freed you and you had to get whippings and some slaves were lynched or killed and were burned."(HMS_F_1).

Arjen: "Does that still happen? Somebody your color [get] lynched and killed today?"

Lashante: "Down in the South they kill people, blacks. I was discussing with my teacher Miss Bryce how all the black kids supposed to get a education when white man is trying to trick them back into slavery again and the only way out is education. But [getting] your education, it really doesn't matter 'cause they're not going to hire you because you're black. So in the world today some blacks have freedom of choice that live in the United States and different countries. [But] like in South Africa they don't have as many rights as we do in the United States. In the United States you can be anything you want to be and in South Africa not. You have to live in a segregated neighborhood and stuff like that. So I would rather live today than back then in the United States." "We were just having a discussion about how blacks in the world today, the black community has come out of unity. They used to be in unity a long time ago, but they were closer to God. I think God is a very important thing in my life 'cause he rules this earth and everything God do is.... all things God help me do... I would be nothing without God, but I am somebody. I get good grades, I get compliments and stuff like that. I think the black

community has gone faded away because they let go like to be worldly and go out into the world and stuff like that let the world trick them. They are not in unity anymore."(HMS_F_1).

Arjen: "Now, did you say that white people are trying to get black people back into slavery somehow?"

Lashante: "Yes."

Arjen: "Can you explain that?"

Lashante: "Down in the South, and this is what I hear from my grandmother, down in the South right now, white people are buying up the land and all the black people move to the North like California, Michigan and they say if you want to decide to go back to the South down in Mississippi, Alabama, Tennessee and all, the white people have bought up all the land and they'll say something like: 'You have to work to live on this land'."(HMS_F_1).

Arjen: "So it's pretty much the same as 200 years ago...?"

Lashante: "Pretty much, not very, but pretty much."

Arjen: "That's interesting. Do you think racism is a big problem today?"

Lashante: "Yes."

Arjen: "Do you experience that yourself?"

Lashante: "A little, only if I go up to Minnesota. I have been up to Minnesota five or six times. People call me nigger. I am just a black person. A nigger is somebody that's stupid and redundant."(HMS_F_1).

Lashante again points at the lack of unity among African-Americans, but adds the importance of God in leading a quality life. Like several of the female students whom I interviewed in the two Detroit schools, she believes that people need the church in order to get back in harmony with each other and to get some stability and humility in their lives. She attends church on most Sundays, something which is encouraged by her mother.

It is interesting to note an apparent contradiction in her statement. She believes that, as a result of racism, African-Americans are denied jobs. This in effect makes getting an education worthless, she seems to suggest. Not only does this contradict her earlier comments about the importance of finishing school and going to college, it also contradicts her believe that in the United States you can be anyone you want to be. While she is aware of factors limiting her opportunities, particularly racism, she still appears to have faith in the American dream. This contradiction returns in many of the Detroit interviews. Even though drugs appear to be the umbrella of all community problems in the eyes of the students, it is clear from Lashante's statements that racism is recognized by students as a barrier to getting to a better life, but not as the root of the problem African-Americans are facing today.

Lashante not only believes that African-Americans in the South are still the victim of lynchings and modern forms of slavery, she also points to other, more subtle and more local forms of racism that affect her community. She believes that suburban communities also have drug problems and drug-related problems, but that the media pay a disproportionate amount of attention to the problems in Detroit. Furthermore, she believes that whites are much better at hiding their problems, which she, again, considers to be the result of being in unity and protecting each other:

Arjen: "Now, do you think the people in the suburbs have similar problems?"
Lashante: "Different, way different! Like someone taking someone else's company. That's the kind of problems they really have.... Car accidents probably, stuff like that."(CMS_F_2).
Arjen: "How about drugs?"
Lashante: "Yeah, some, the rich people, they cover up, they get it from the poor people and they don't think they're uppity, that's why we started selling drugs and stuff. Like the business people, they need something to keep them off up, and all that, so they go to their drug pushers or go to their pharmaceuticals and get pills."(CMS_F_2).
Arjen: "Do you think that's the same thing, really?"
Lashante: "Aha [Yes]."
Arjen: "You don't hear much about that that much."
Lashante: "I know, 'cause they cover it up! They don't go out there and start (telling on each other). They pay. It's like they can pay whoever they want to. They pay cops, everything. It's always money."(CMS_F_2).

So far we have seen a young woman who is acutely aware of the problems in her community. She is fortunate enough to have a support system in the form of her mother, uncle, grandmother and the church that brings some stability to her life. As a result of the violence in her community, she is very limited in her mobility. She recognizes the importance of education, but at the same time realizes that, because of racism, it may be difficult to get a job. At least for now, she has been able to resist peer pressure and the temptation to get involved in the cycle of drugs, fashion and violence. Growing up under these circumstances, how can one still lead a quality life? Lashante has found a way, again, at least for now. She has developed her own dreams, ideals and mission in life. She appears to have created a separate reality, but a reality nonetheless, that keeps her focused and provides a sense of purpose. When talking about her expectations for the future and the things that are important to her in life, she lets us peek into this separate reality:

Arjen: "What are the things that are important to you in life? What makes life interesting for you?"

Lashante: "First God and my religion and education and wisdom to know right from wrong and I have a whole lot of family that teaches me; my aunties talk to me, my grandmothers, my uncles, my friends. So I have people that know from these things, that have experienced these things, tell me how it's like. Wisdom, education, God, being the best you can be, working towards your goals." "I want to go to college, I want to become a [lawyer]." "Since I was three years old I have always wanted to be a lawyer, so that's what I am going to do." "I used to watch all the cops shows and everything and they had the lawyers and how they defended people and I am a people person. I like to help people and be around people and I believe if I can do that and I have a mouth, I can talk so that's..." "The main focus today is that Black kids, especially girls, have to focus their minds on education because that's going to matter in the future. There's not going to be average jobs (with a car and an average salary in the year 2000 if you don't have an education). They [are] talking about [that even] for a McDonalds job you have to have a high school diploma." "So I can't afford to drop out of school. I don't want to end up flipping burgers at Macdonald's. Those are about the things that keep me in school." "I can see if I can be a lawyer and I get a good paying job and everything I might be appointed D.A. and then I'll be mayor and may be I can get up to the President of the United States and I will really have control and I can do something about this problem."(HMS_F_1).

The above compilation of excerpts shows Lashante's recognition of the importance of adult role models, religion and education. It also shows how focused and ambitious she is when describing how she wants to become a lawyer and perhaps even President of the United States some day. Her conviction that in the United States you can become anybody, as long as you put your mind to it, is very strong. Like many of the Detroit students who took part in this study, Lashante places much emphasis on an individual's ability to influence her destiny. A consequence of this emphasis on individuality may be that in case of failure, you have only yourself to blame. Perhaps at the other extreme, you can find individuals who believe that their destiny is either predetermined, for instance, by a God, or largely determined by elements in society. The latter individuals perhaps would not be inclined to blame themselves in case of personal failure, but would respectively consider it God's will or blame society as a whole. Like the boys in her school who want to become scientists or pro-football or pro-basketball players, the odds of Lashante becoming lawyer, district attorney or President of the United States are extremely small. Nonetheless, her ambition and belief in her own

abilities keep her focused on her education and keep her away from the distractions mentioned earlier. The question is, for how long?

It is interesting to note that many of the Detroit female students I interviewed expressed the desire to become a lawyer. Many of them are extremely sensitive to injustice and several of them cite local examples of a failing justice system, varying from innocent people being sentenced to jail and corrupt police officers and judges, to punishments that are disproportionate in relationship to the crime. By becoming lawyers they hope to be able to work toward a more just society.

Whereas, in Lashante's eyes, people's individual destinies are largely determined by their individual actions, the destiny of the world as a whole is determined by a higher being. This becomes clear when we talk about the threat of war:

Lashante: "People want to rule the world and they have to understand that it's not going to be how they want it anyway. The world is going to come to an end one day. Why (are) people fighting over the world, because the world's going to be destroyed one day 'cause we can't live on this earth forever and ever and ever if earth being destroyed."(HMS_F_1).
Arjen: "How do you think the world will come to an end?"
Lashante: "God."
Arjen: "Yeah? Do you think he'll decide some day?"
Lashante: "He already decided."
Arjen: "....but nobody knows when...?"
Lashante: "No. Soon!"

Her belief in a God who has already decided that the end of the world will come soon is bound to affect her outlook on life. Not only are peoples' attempts to control the earth in vain and useless, but the same might be said about people's attempts to conserve and protect the planet. As will become clear in the chapter on the students' perceptions of environmental issues, the latter conclusion is inaccurate. The more religious students seem to say that even though a God may have already decided on the end of the world, we still need to conserve and protect the earth to assure a quality life while it lasts.

Lashante does have a picture of future in her mind that takes her away from Detroit, even though she would not mind staying there to improve the community, and even though she is not too proud to live there. When we talk about the world twenty years from now, she acknowledges that drugs will still be a problem, but she does see some positive things in her neighborhood that might change things around.

> "I don't like children not that much. I just want to be married and live in a quiet town without all of this. I may have one child, but not really. Right now I am trying to get my education and travel a lot and then if I meet a man that's very special to me I will marry him and we'll just have to sit down and discuss this and I'm just a child, I don't know that I can tell the future and stuff like that." "Drugs, violence and not caring. Those are the major three issues in the world today. I think if people care more and take time out and help the people that they feel need help [the world would be a better place]. Because just saying it is not going to help nothing. May be they could do something to help try."(HMS_F_1) "Some people just don't understand that we don't want trouble in our neighborhood. We don't want the shooting and drugs and everything. And [only] if they knew how badly we don't want it.... Sometimes we do let them know with our programs that we put on. Like with our little kids program we show them how much we don't want drugs and violence and we don't want all that bad stuff going on in our neighborhood, and we show them how much we want them to [become good citizens]."(CMS_F_7).

Lashante does not appear to fit the image of a potential school dropout who under the influence of boys and drugs, will become a mother by the age of fifteen. Very much aware of the suffering and victimizing of the young people around her, and the long term drawbacks of the instant gratification route, she appears to be very alert to the temptations, while at the same time very focused on her education. Furthermore, she still does believe that the community can become a better place when people in her own community begin to work together, and when people outside of her community, as well as the people victimizing the community, begin to realize how badly the people affected by the violence want to get rid of it.

Even though Lashante does not want to abandon her neighborhood, and even though she portrays her side of the street in a very positive light, she does have some dreams about other places to live and other places to go to. Her thoughts reveal some of the fantasies that are in sharp contrast with

her everyday life in the projects, and at the same time remind us that despite all she has already experienced she is still a child.

Lashante: "I was thinking of moving to the Bahamas." "It's very quiet. You can walk on the sand bare foot without worrying about getting your toe cut or something like that. It's nice." "Some day I would like to live in Egypt and be a world traveller. So I'd like to be, I don't know, a billionaire, build my own town."
Arjen: "What would your own town look like?"
Lashante: "The old Detroit. I like the old Detroit. It's a historical museum down town. I went downtown and just loved it. That's how they built it like the 1800's. But I know that's in the past so I don't know if I'll be able to do that or not, but I am trying to look at some of the buildings to see how I can, you know, build it up again. But I don't think it's going to happen."(HMS_F_1).

A repeating theme throughout the description of Lashante's life is her emphasis on education. What role does school play in her life? We have to realize that her time at school makes up a significant part of her day. She gets up at 7:00 am when her mom awakes her. While her mom leaves for the technical college she attends, Lashante prepares breakfast for her two younger sisters who attend the elementary school nearby. Her half-brother, who used to attend high school but dropped out, will usually get up later. She walks her two sisters to school first and then meets two girlfriends with whom she continues walking to school. At school she spends about six and a half hours everyday, before picking up her two sisters again and walking straight home. Upon arriving at home, she immediately calls her grand-mom to let her know they've arrived safely. In the afternoon she does her homework, takes care of her sisters until her mom returns, and helps her mom prepare dinner. In the evening, as well as parts of the afternoon, she watches TV. She goes to bed at 10:00 pm.

All the hours at school are spent inside the building: lunch is provided (some schools will provide breakfast as well for the poor) and physical education classes are also held indoors (even though they have a nice sports field outside of the building and even when the weather is beautiful). At school she has her own group of girlfriends, her own group of 'rivals,' teachers she likes and teachers she dislikes, and subjects she likes and dislikes, not unlike any other thirteen-year-old middle school student. In the section on the community and the school, I already referred to school as a bunker in a war zone and a relatively safe haven where students are to a degree free from

the community stress that is so present outside of the building. If school is not seen as 'the ticket to a better life,' then at least it is seen by many students as a safe place where they can be uninhibited without having to pay a severe price for it -- although it is true that fights and animosities between students, sometimes carry over to the streets where they can escalate into a shooting or a stabbing -- and as place where you can socialize and meet people. The latter is important given that socializing is virtually impossible on the street. Not only is it unsafe, often police will not allow groups of people to gather outside in public places (also called loitering). Public places are generally regarded as owned by the drug lords, users and pushers, and are only crossed during daytime to get from one place to another. It should be no surprise that school is important to Lashante. I ask her whether she likes school:

> "Yes, because you don't have the people who are bringing in the knives and everything to school, and you have the nice teachers who, except for some teachers in the school we could do without, but [overall] it's a very nice school. Like we had a problem today in our math class, which is almost every day... We have a teacher who wants to teach, but I don't think he knows the right way to teach because I was taught: if you have a question of something that's being said, you should raise your hand. He is a person, if you have a question, he don't want to answer your question. And I think that's very wrong. If you want to teach, how are you gonna know what someone doesn't understand if you don't answer their questions?"(HMS_F_2).

Like many of the students I interviewed, Lashante does have complaints about the things they are taught and the way they are taught. On several occasions she points to the irrelevance of some of the things they are taught. She also thinks that many teachers do not listen to what students have to say, and is concerned about the increasing lack of discipline among students and the increasing fights in and around the school:

Lashante: "Kids should be more disciplined 'cause they just let us get away with stuff. They should probably be a little harder on some of us." (HMS_F_3).

Apparently the problems of the street enter the school building more frequently, thereby challenging the school's image of a safe place to be. In an earlier segment I described some of the precautions some schools have been taking: metal detectors, hallway monitors, locked outside doors, doorless toilets, identification passes and dress-codes. Nonetheless, for Lashante school is an important and valued part of her life. In many ways school,

along with the support she receives from her mother, grandmother, uncle and her church -- something many of her friends have to do without -- brings some stability and security to life in a very unstable and unsafe community.

School is important to Lashante. Not because it is interesting, meaningful or relevant, but because it is a relatively safe place where she can meet her friends. School is also important to Lashante because ultimately a high school diploma will get her to a college which is an intermediate step towards achieving her goal of becoming a lawyer. But, unlike her peers from Royal Oak and Colby middle school in the northern suburbs, Lashante will have to work against the grain and will have to build a wall around her to protect her from the distractions that are so overwhelming in her milieu.

The stage has been set for Lashante. The context in which she goes to school has been provided. I will now move to the portrait of Rumeal to illustrate that for the young African-American male, despite some obvious similarities with Lashante's context, there are also some important differences.

3.2.2. Rumeal: Just do it!

Rumeal is a thirteen-year-old "young man" who lives with his mom, father, older brother, older sister and grandmother on a block in a seemingly nicely kept street. Like many of his peers, Rumeal has moved several times within an area of a couple of square miles. Rumeal represents the 'endangered young African-American male' who has been in the news lately. The statistics are telling; the life expectancy of African-American males is lower than those of people living in many Third World countries; one out of four African-American males is either in jail, awaiting sentencing or on parole which totals to a number higher than the number of African-Americans enrolled in institutes of higher education; drop-out rates and unemployment levels among African-American males are higher than those of any other group; and homicide is the leading cause of death among African-American males and has reached "epidemic proportions."

The statistics may be telling, but they don't tell the whole story. Earlier Lashante told us about the impact of drugs and violence in her community, the pressure to give in to temptations and distractions, and the ways to cope with them. For Rumeal the impact, the pressure, the temptations and distractions may be even greater. He is privileged to live with two parents and his grandmother in the same house. They bring positive role models and some stability to his life, something many of his friends don't have. Nevertheless, life is not easy for Rumeal as will become clear.

When talking to Rumeal about his neighborhood, he pictures a nice place to live deprived from the ills Lashante talks about. The few concerns he has appear to be trivial: sometimes the street lights don't work, some people will not dispose of their garbage properly and it is difficult to play catch football on the streets because of the traffic. Drugs and violence are not a part of his neighborhood:

> "It's okay, there's not a lot of violence in my neighborhood. We have a lot of neighborhood programs and stuff like that." "There's no drug houses or anything or abandoned houses. Everybody lives in a house on my block. So basically it's just like every other neighborhood."(CMS_M_5).

Rumeal has several friends with whom he spends a lot of time either at the local recreation center or at his home playing Nintendo, a computer game which appears to be tremendously popular among his friends. In addition, he likes to play basketball and touch football. Rumeal's world, on first sight, does not seem to be all that different from the world I grew up in as a kid. Like many of the boys in the Detroit middle schools, Rumeal begins the interview by portraying his life in a positive light. At first this confused me: do guys like Rumeal live in a different neighborhood than girls like Lashante? As the research continued, it became clear to me that many of the boys at the onset of the interview denied the presence of community problems, while many of the girls would immediately describe the reality that challenged them. During the course of the interview, however, as if inevitable, Rumeal would gradually begin to lift the curtain and allow me to look at his world. The following narrative account reveals a different world. Rumeal is talking about a crackhouse on the street:

"All they'd be doing there is selling drugs. That's why the police --'cause this lady who had got tired of it because her son was into it. She had called this number that they ran on TV; how to crack down on drugs. And she told about all the drugs that was going on. Two days later she woke up and the police was all over the place. They had to block two blocks down. They had the whole thing covered." "And they just went --I am telling you-- they had bulletproof vests on. 'Cause --I am telling you-- there was this man about your height --no, he was a little bit taller than you-- he was black, he just came up with this big gun. It was like this and it went BOOM, BOOM. There was like six police."

Arjen: "Did you see that?"

Rumeal: "Yeah, I have seen the whole bust. It was like two houses down from where we were. And my mother told me they were shooting all over, it was all over! And the police had told all the people on the block to come out of their houses before. 'Cause at first it was quiet and it was like, my mother came in and shook me, woke me up and told me to put on my clothes and hurry up. And we was all outside and then there was this one man, he just walked around the house. It was a police, bullet proof vest on. He was black. He walked around the house about two times, came around a third time then... POW [imitates sound of gun] 'FREEZE,' like that. My mamma told me to get down, then my daddy was like: 'No, let him watch.' He told me to get down on the (....) and see what happens. He said: 'I want you to see this.' He sat us all down when we got home, he said: 'I wanna see none of y'all like that. Y'all see what will happen.' We was all lying down on the ground, like this, watching. And a man just came up. When he walked up the police, this man just ran up and said BOOM. This other man was on the floor like this. Another man on the side like this. And there was one man sitting on the corner like this. And there was a whole lot of police coming around the car, I mean the house, and this man came up shooting, just shooting anything. He just came up and they shot him and he fell over the bannister."

Arjen: "Now why did your dad make you watch that?"

Rumeal: "Because he said it's better for me to watch what happens with people who do those types of things and to show me that drugs is not what I should be and show me what happens to people who do those type of things and my mother said she wanted to me to make something of myself, and my brother, 'cause he was coming to the age [to do those things], he was about sixteen. My daddy told me he wanted me to watch that to teach me a lesson that drugs is not the way he want me to go. To show my big brother, it's not right to try to kill another person, especially a cop. 'Cause my, he said, my brother was just coming to the age. He figured that if we see what we have seen there, may be we won't wanna live that type of life. So that's why he made us watch."(CMS_M_3).

The above excerpt is not unique. Several students have described similar incidents, but not as vividly as Rumeal. His father made him watch to teach him a lesson, while his mom asked him to get down on the floor. Rumeal, also is aware of the devalued value of life in the neighborhood. Kids get shot for wearing the wrong clothes, for insulting somebody -- sometimes without even knowing it -- and for an array of trivial actions. Many of his friends, if they do not already have a gun, know who has a gun

or where to get one. Fistfights often escalate in a shooting or stabbing, and gang related activity is on the rise.

> "People kill each other over clothes like this and shoes like that [he points at his shirt and shoes]. I don't think that that's fair either. I think that..., like I have Jordans, I had a pair of those and somebody stole one of'm and I don't know who. They didn't do it in my face. It was in this school and I had put'm in my locker. Somebody had broke my lock and took one of my shoes, but I don't know why he didn't take the other one 'cause it really didn't make sense." [Describes shoes and the incident] (CMS_M_3).

For Rumeal, staying out of the cycle of drugs, fashion and violence is not easy. Several of his classmates, would wear expensive leather bomber jackets, designer jeans, gold chains and Air Jordan's to school, before the school put a dress code in place disallowing the wearing of flashy clothes and jewelry. He too has seen fellow students drop out of school, only to return to school to recruit new students for the drug lords. Boys that are Rumeal's age are very popular among the drug pushers since they cannot be prosecuted as adults and the lords do not need to bail them out in case of an arrest. Rumeal tells me that he will be alright because he doesn't pay any attention to it.

Many of the students, motivated by what they regard to be a failing justice system, the frequently experienced instances of death in the community and the hatred that appears to increase with every one of them, have developed and 'eye-for-eye' morality which includes violent retaliation and revenge. Illustrative, may be the incident of Taneea, a twelve-year-old girl who was shot in an act of revenge. A few hours before she was killed, her brother Ricky had stepped on someone's toe and the injured party took offense at the way Ricky had said, " 'Scuse me." Taneea and her two sisters were asleep when the gunman sprayed the house with bullets to take revenge on Ricky. Ricky was not home at the time, but Taneea was hit in the back of the head, probably by an Uzi (Detroit Free Press, 1988). When Rumeal's class discussed the Taneea drama in a conflict management context, the whole group unanimously agreed that the gunman should not have killed Taneea, but Ricky instead. In other words, even though the offense was " 'Scuse me,' only the victim was disputed and not the act of retaliation with an Uzi.

Alex Kotlowitz who wrote a book on the life of children in Chicago's inner-city, titled: *There are no children here* -- a title which originated when he told a mother that he wanted to write a book about children in the projects to which she replied, "But you know there are no children here. They've seen too much to be children" -- points out that to children like Rumeal, avoiding neighborhood violence is an integral part of their daily life" (Kotlowitz, 1991). Rumeal knows the rules: don't step on anyone's toes, avoid certain people and places, drop to the floor at the sound of gunfire, when outside, look to see where shots are coming from before running for shelter.

Kotlowitz also talks about the apparent calm with which young adults attend the funerals of friends and relatives, without shedding a tear. In Rumeal's class eighteen of twenty-four students raised their hands when asked whether they knew of a relative who had been shot. According to James Garbarino of the Erikson Institute for Advanced Study in Child Development, this outward calm is deceptive. In an article by Barbara Kantrowitz in Newsweek, Garbarino argues that children like Rumeal and Lashante must turn off their feelings in order to survive in a war zone. To be open and emotionally engaged, according to Garbarino, would be too exhausting and too threatening (Kantrowitz, 1991).

In his book *"No place to be,"* Garbarino makes a comparison between children growing up in the Chicago projects and children growing up in the Middle East and Cambodian refugee camps (Garbarino et al., 1991). He concludes that there are clear similarities: "guns are widespread, trivial disputes end in violence, adult males are often a marginal presence, mothers are frequently clinically depressed. In both places, boys in their early to mid-teens have already become frontline warriors. In Cambodia they are guerilla fighters; in Chicago, they are gang members." (Garbarino in Kantrowitz, 1991). Kotlowitz found that many of the children he interviewed had difficulty remembering routine events, possibly because they were accustomed to blocking out so much, and that many were hyperactive or suffered from stress-related ailments, including post-traumatic stress disorder (PSTD), an illness commonly found in war veterans (Kotlowitz, 1991).

Blocking out information, not paying attention to disturbing events, suppressing emotion and denying real-life phenomena all appear to be part of Rumeal's survival strategy. Not only do these processes prevent students such as Rumeal from becoming too exhausted and too threatened, to use Garbarino's words, they also allow for many of the young men in Detroit to have a dream of a happy and successful future. Whenever I asked the boys how they pictured their future, they indicated that they wanted to become an engineer, a lawyer, a professor of science or biology, an architect or a pro-basketball player. Without suggesting that it's impossible that these wishes will ever come true, I believe that the chances for these students to become a pro-basketball player are slim. Yet in the end it was the pro-basketball player that came out strongest:

Arjen: "What do you wanna do in the future?"
Michael: "Probably be ....I am a real sports person. I like to play basketball a whole lot. And I think I don't want to be behind no desk. I might be.....I was thinking about being a scientist or a professor of science or biology." "Or I was just thinking about trying my luck, trying to be a basketball player in the pro teams."
Arjen: "What's your favorite basketball team in the NBA?"
Michael: "I like the Lakers a lot but they have a lot of people on their team that I have met before, like Magic Johnson . . ." "I met him, shook his hand at a couple games." "I met with Worthy, and I met Isiah Thomas."

Arjen: "What high school do you want to go to?"
Michael: "I think. . . It depends on the sports or any kind of sports. I want go... I don't have no particular high school for sports, but I want to go where I think I can be drafted to a good team like college can get drafted to a good team; the pros. And when it come to academics, I think I want to go to Renaissance. That's where my sister go. Or Cass. 'Cause I don't want to go to a little school 'cause it's hard for you to get known by colleges, even though you have good grades. So you go to one [that's big and well known]. Mostly everyone at Renaissance is promised a scholarship soon as they walk in. So I want to go there."(HMS_M_1').

Reading over the interviews, the basketball talk and the "trying of my luck" reminded me of the lottery sales. The dream of winning the lottery seems to have something in common with the dream of becoming a pro. In both situations people are fighting the odds to get out of a negative situation. The students have seen the basketball stars who are successful themselves. Just as the Lottery sales pitch on the television shows the lucky ones who won and now live in a villa with a pool and fancy cars, the media show African-American athletes who make millions of dollars a year. The

successful pro's are perhaps the only positive black role model these young men have.[4]

Ignoring one reality requires the creation of another. All but one of the students I talked to watch a lot of TV. On average, they watch four hours a day. A teacher told me that many of the students have cable TV at home as well as a VCR. He told me that he could tell who in class had stayed up late to watch a late show. He also suggested that many parents use the TV as a "babysitter." I did noticed a lot of video stores on the commercial streets leading to the schools. In addition to playing Nintendo and going to recreation center, Rumeal spends a lot of time watching TV. I asked the students about the kinds of shows they watch. They mentioned shows such as: "It's a Different World", "The Cosby Show", "Good Times" and "Fresh Prince." These are shows with African-American actors as the lead characters who present a world that for most African-American viewers indeed is different.

The theme of denial may not be so negative, when considering that these rationales provide something to strive for, as well as a way to avoid getting hurt. The denying of the odds does raise a concern however: how do the students perceive their chances of becoming a pro, for instance? Do they put their dreams in perspective, or do they put all their hopes on it in order to make it come true? In the latter case their dreams will shatter. To what extent does the creation of a different reality lead to conflict and *"a world of myths and illusions in which it becomes difficult, if not impossible, to distinguish*

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[4] Athletic shoe and designer clothes companies have been accused by organizations such as the Rainbow Coalition and Operation Push of glorifying street violence in order to appeal to African-American youth. A commercial by Reebok for its "Black Top" basketball shoes shows tough looking young men playing an aggressive game of basketball in a back alley and portrays the deteriorated neighborhood in a romantic fashion. A similar image of toughness and glorified street smarts is portrayed in a Soviet Jeans add, where somebody being chased down in a bad neighborhood survives because he is wearing the right kind of designer jeans. Another frequently used strategy is to use successful African-American athletes to sell a product. Many of the Detroit students have seen the ad put out by a car company which shows Isiah Thomas help a short young man who was left out of a pick-up basketball game, get into the game. Once the young man is in the game and is showing off his skills, we see Isiah leave in his red sports car.

the real from the make believe, and lies from truth?"[5] Despite the situation many of the students find themselves in, they do not seem to perceive their lot as objectively unfavorable, which in itself seems to hinder their own possibilities of success. This notion, combined with the emphasis students place on an individual's ability to become anyone they want to be, regardless of systematic and institutional barriers, puts them in a very vulnerable position that ultimately may also be a barrier to social change.[6]

The male students left me with the impression that school was not the most exciting place, but at least a place where they could see their friends in a relatively safe environment. Like Lashante, Rumeal claims that a lot of what they are taught is not very meaningful to him. Social studies, for example, seemed to be the equivalent of history. When asked what kinds of things they talk about in social studies one of students answered: "Well, we talk about George Washington and slavery and like in the 1800's and we look at maps, and that's about it." Rumeal has the following to say about school:

Rumeal: "I think at my older school they gave us more freedom and they (let us) go to our lockers any time you wanted. The teacher was more courteous. Teachers here, they just like to drag on the lessons. (There they used) to do (it more exciting). Not like nobody was fighting but.. The teachers there alive! Here the teachers are dead. They get tired. That's how it seems to me: they get tired of teaching kids. So they just drag on with the lessons. Drag on. It's really boring."

Arjen: "Why do think it's boring?"

Rumeal: "...The teachers, they don't... they don't (let me) do anything. They just tell us to read out the book and answer questions."

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[5] Banks, J.A. (1972) Liberating the Black Ghetto: Decision-Making and Social Action. from: Teaching About Life in the City. Edited by Richard Wisniewski. National Council for the Social Studies. 42nd Yearbook.

[6] During the Senate confirmation hearings of Supreme Court nominee Clarence Thomas, who was purposefully portrayed as an African-American self-made man, Thomas' opposition to affirmative action was challenged by minority groups. Simplified, the argument by conservatives, including Thomas, is that nobody should be given advantages based on color or gender to make up for past discrimination, and that discrimination cases should be judged on an individual basis. The opposition, including the NAACP, maintains that this stance only works in an ideal society that does not have systematic and institutional barriers for women and people of color that impede their advancement; affirmative action is required to make up for past discrimination, and to destroy these systematic and institutional barriers currently in place in the United States. On one end of the debate are those who strongly believe in the individual's ability to rise from the ghetto, on the other end are those who maintain that given the downward spiral, it would be unreasonable and unfair to expect that every minority would be able to drag himself out of poverty. Perhaps ironically, many of the Detroit students who are part of this study seem to subscribe to the conservative view.

Arjen: "Do you think that the things they talk about in class are interesting?
Rumeal: "Well, to some extent. Mr. Johnson, I like science. I think I wanna major in a lot of science classes when I go to college." "And I have a lot of (pets..) so I like it in his class, but classes like ... my english class or my math class: some of the stuff they teach us in math, I don't think I am never gonna use again. So, the things that they teach us that we are not gonna use, they shouldn't teach to us." "I mean they should teach us, but shouldn't spend as much time [on it].

Rumeal: "[School] could be a [lot] more fun for some kids when they want to learn and [not] be against learning. This school, I mean it should have some more advantages than what it does. I don't really think it has any. But it should have more. Like a big computer system. I was looking, I want a computer, but I was thinking that if I could make a phone module, I could almost make a computer. So I'm working on a computer now. And my phone module, I don't quite got all the bugs out so I am still working on that."
Arjen: "Sounds like you want to do more stuff in the school, rather than sit and listen."
Rumeal: "Yeah, like one of my classes, I go to Ms. Bondi twice in one day. I think I'll want to cut one of the classes and go... They ought to have extra curriculum like, not really Wood Shop, but they ought to have a class called Inventions or something so that kids can invent. 'Cause a lot of people can invent stuff. .... And it's a lot of talented people in our room."(HMS_M_2').

Rumeal clearly expresses an interest in learning, a compassion for animals and science, the desire to have more freedom and the wish to create new things. He also seems to be bored at times by, what he regards to be, meaningless subject matter that is being in taught in an uninteresting way. Staying in school is important to him, at least for now, for it is the only way to get to a good high school and to college. If he wants to pursue his dreams of becoming a scientist or... a pro-basketball player, then he has to finish his education. Besides, Rumeal argues, selling drugs is not going to last long: "Because in the years to come the drug problem will be solved and you wouldn't have anything to sell. And when you have an education, you have to make money the hard way or the old fashioned way, as they say. If you get a good degree in a major field, you could probably have a job for life." The idea that the drug problem will be solved in the years to come, is not shared by all the Detroit students I interviewed. Many of them have not seen any change in their community since the so called "war on drugs" begun a few years ago, and several of think the drug problem will get worse.

3.2.3. Summary and Conclusions

When looking at Lashante's and Rumeal's descriptions of their world, descriptions which are a composite of complementing accounts of most of the Detroit students interviewed, we see a dynamic world full of contrasts and extremes. On the one hand they both find that they are fortunate: they live on a relatively nice block and both have some parental guidance, they are not involved in drugs, and both are still in school. On the other hand they find themselves in a community that is almost saturated with drug-related problems such as street violence, teen pregnancy and what they see as a failing justice system. To cope with the violence in their community they have developed a variety of survival strategies: they know what to do when they hear gun shots, they are able to suppress their emotions and to ignore parts of their reality; they know how not to draw attention to themselves and know what places to avoid; they spend a lot of time indoors, mostly using the outdoors to get from one place to another, and they have developed their own dreams and fantasies which provide a mental shelter and allow them to stay focused on school.

Both Lashante and Rumeal have high hopes for themselves. Lashante wants to become a district attorney and perhaps even President of the United States, so that she can correct some of the injustice she sees around her. Rumeal would like to become a scientist, but most of all a pro-basketball player in the NBA. He is looking to go to a high school which has a good, highly visible, basketball program, so that good colleges will eventually draft him. They both believe that if they focus and put their minds on it, they can become very successful. Both Lashante and Rumeal think there is racism that affects some African-Americans individually, but they do not think that African-Americans are systematically denied opportunities as a result of the color of their skin. The main problem Lashante sees is that African-Americans are not united: they fight with each other instead of working together to improve their situation. The drug problems take up most of the community's energy. Hence, there is no energy left to begin to clean up the neighborhood and improve living conditions. When people start caring about each other again, Lashante suggests, they will be able to get the drug problem under control, so that they can begin to improve the neighborhoods.

The students' emphasis on their individual capability in advancing and achieving their personal goals puts a lot of responsibility on their own shoulders. While believing in their own capabilities and having high self-esteem may increase their chances of success, the question arises: what will happen to them when something goes wrong? Will their belief in the American dream, the "be all you can be" philosophy, and the power of the individual, lead them to only blame themselves, in case of failure? What if Lashante does get pregnant? What if Rumeal doesn't make the high school basketball team? Is there a back-up plan for these children?

Both Rumeal and Lashante can be seen as two thirteen-year-olds caught between hope and despair, childhood and adulthood. Despair because of all the misery and tragedy they have already seen in their short lives. Hope, because they still have dreams and believe they will be the ones to end up on the right side of the spectrum of failure and success. Childhood, because they are still children in the prime of their development. Adulthood, because they have seen too much already in their lives, and are already engaged in tasks normally done by adults.

School is important to both Rumeal and Lashante, but not for school learning which appears to be mostly irrelevant. School performs many other functions for them; it provides stability in their lives, it is something they can depend on, it provides a shelter in a troubled neighborhood, it is a place where groups of students can socialize, something which they can hardly do outside and, finally, it provides the education needed, if not to fulfill their dreams, then at least to keep them out of the cycle of drugs, fashion and violence. So, even though both Rumeal and Lashante criticize some of the content of the subjects they are taught and the way some teachers teach, they still value school. They are definitely at an advantage compared to their peers who already have left school.

The context of the lives and the schooling of the Detroit students has been described. When reading about the perceptions of nature and environmental issues of some of the Detroit thirteen-year-olds, when reading about how they think they can influence environmental and social change,

and when reading about the role of environmental education in their schools, this context should be kept in mind. I will now turn to the the lives of the students in Forest Grove and Barnsley.

3.3. The Children of Forest Grove and Barnsley

Arjen: *"What things are important to you in life?"*
Bill: *"My friends, my family, my animals, ...making people happy and not have to worry about things. That's.... I have to worry about pollution, I have to worry about all that stuff. I don't wanna worry about that. In Canada like when I'm living alone, there's nothing to worry about." (DMS_M_2).*

Describing the lives of the students from the Forest Grove and Barnsley middle schools, is in many ways more difficult for me than talking about the lives of the students of Detroit. Earlier, I justified studying the perceptions of nature and environmental issues of both the children in Detroit and two of its northern suburbs, by suggesting that doing would elicit some contrasts. These contrasts could then help understanding the different experiences children of the same age group, living under radically different circumstances, bring to an environmental education project. Part of this so-called "cross-cultural dimension" of the study emerged from experiences I had had while facilitating the Rouge River project which involves schools from rural, suburban and inner-city areas in southeast Michigan.

Even though both groups participated in the study, it would be unfair to say that this is a balanced study. As explained earlier, my main concern and involvement was with the Detroit students. Although the study might provide valuable insights that could possibly improve environmental education in the schools like Colby middle school and Royal Oak school, my main goal was to obtain some insight in the way young African-Americans growing up in a Detroit neighborhood think about nature and environmental issues, and to use these insights in finding ways to develop environmental education in city schools. In a sense, one could say that initially the idea was to use the contrasts obtained from comparing "suburban" students' perceptions of nature and environmental issues with those of "inner-city" students in order to make environmental education

accessible, relevant and meaningful for the latter group. As will become clear from Chapters IV and V, it doesn't really work that way. The students from Detroit, as different as their lives may be, have a lot more in common with each other's thinking about environmental issues than I had anticipated. The real contrasts are in their lives, but by setting up the study the way I did, the contrasts tend to become the main focus at the expense of the commonalties. My presence in the Detroit schools for over two years, albeit two interrupted years, made me more sensitive to their lives and their concerns than to those of the students from Colby and Royal Oak school where I spent relatively little time. This adds an extra constraint to the description of their lives. Whereas it was difficult to provide a fair picture of the Detroit students' lives using composite portraits, it is even more difficult to do so for the Forest Grove and Royal Oak students.

One phenomenon I ran into during the interviews with the students from Barnsley and Forest Grove was their inclination to play the school game. The students from Colby middle school and Royal Oak school know how to succeed in school by understanding the culture of schooling. What I mean by this is that they are aware of the kind of knowledge and replies that are rewarded and valued in school, they know how to be diplomatic, they want to impress the teacher when they are being observed or asked a question, and they calculate possible outcomes of their behavior. What this means for an interview is that many of the students, at least at first, would not believe me when I told them that there were no right or wrong answers to my questions. I could sense that when I asked a student a question, that he or she would pause and think about possible answers and make a judgment about which one would be considered correct by me. On one or two occasions I suspected that a student had either prepared for the interview or had been briefed by a parent on the main subject area which had been described by the school's principal in the parent-letter requesting their permission for the interview (Appendix A). There was no doubt in my mind that most of the students took the interviews seriously from an academic point of view

This was not the case for all the Forest Grove and Barnsley students, but it certainly stands in sharp contrast with the Detroit students who would immediately tell me what they thought personally, ask me to rephrase a

question if they did not understand it, tell me point blank when they could not answer a question or think aloud when they weren't sure about their feelings. Hence, during many of the Colby and Royal Oak interviews I had to spend some time convincing the students that I was not a teacher, that the interview was not a test, that I was not going to discuss the interview with the teacher, and that I was truly interested in what they themselves were thinking and not in what they thought would be the "politically correct" thing to say (although that is interesting as well). The irony of all of this is that even though, at least on the outside, I have much more in common with the Colby and Royal Oak students, it took much more to gain their trust and to get genuine responses, than it did with the Detroit students who were eager to speak their minds and not worried about me going to the teacher to share the "results" with him. If anything, I felt that the Detroit students wanted me to share the interview discussion with the teacher so that he would be told the truth, while the Colby and Royal Oak students would only want me to share the interview with the teacher if the "results" were good: a very different outlook indeed.

With the above considerations in mind, I will attempt to portray the lives of the students from Forest Grove and Barnsley. For a description of the Barnsley community, I refer to Chapter II. Chapter II also has a description of the Forest Grove community, but this description is less relevant, given that many of the Royal Oak students live far from the private school, in other, mostly suburban and some rural, communities. Again, I will make use of so-called "composite portraits" as a way to provide the reader with an exemplary slice of life. While reading the descriptions, the following should be kept in mind:

a) Although the portraits have been created, the statements made about them and the quotes used, are not fictional. The descriptions are intended to describe the reality that challenges the students. The aim is to sketch the students' reality as constructed by <u>them</u> as accurately as possible from my limited vantage point as an outsider.

b) The two realities described are by no means <u>all</u> realities that can be found among the students interviewed. The sketches do not describe all students, nor do they describe any one student in particular. The descriptions are a

compromise to honor both the diversity and commonalties that exists between the students, at the expense of both.

Melissa and Bill

Both Melissa and Bill live in quiet neighborhoods with lots of trees, shrubs and well kept yards. Melissa lives with her sister and both parents in a four bedroom house located on a dead end street, about ten blocks away from school, three blocks away from the Rouge River and nearby a big park. She usually walks to school in the summer and takes a school bus in the winter. Both Melissa's parents work full-time. Her father is an architect while her mother is a vice-president of a big bank in downtown Detroit.

Bill lives twenty miles away from school in a new development on what used to be a wetland. His house, which he describes as a "villa," is located on the shore of a lake. Behind the house are some woods that stretch all the way to the lake and in front of his house is a big front yards that borders a busy road. Bill's mother takes him to school every morning on her way to work and she picks him up on her way back two hours after school finishes. Bill's parents got divorced two years ago and his father moved out of the house. He does see his father a few times a year at his apartment in California or at his cabin in northern Michigan.

Because Melissa's parents both work full-time, the family does not get to go on trips as much as they used to. Like many of the families of her friends at school they occasionally go on, what I call, condensed trips: trips in which fun, play and recreation are condensed into a short period of time during which everything has to occur at a highly intensified level. Melissa expresses feelings of disappointment over this:

Arjen: "Do you ever go on family trips?"
Melissa: "Well, yeah, my sister goes to university, and she doesn't come as much with us 'cause she has lots of things to do, but my mom goes to Europe a lot for business trips, and my dad goes with her, so we go there a lot. And for Christmas and Thanksgiving we go to lots of fun places, but I don't feel we go enough 'cause my mom is always working and my dad is always working. We don't really go to little things like the cider mill or the farm or something

like that. We used to, but not very much anymore. If it's a trip it would be kind of a big one during a holiday."(DMS_F_4).

Trips are planned well in advance and sometimes combined with one of the parents' business activities. Both Melissa and Bill seem to admire their parents for working so hard, but they resent that they do not get to go on trips as much or do spontaneous things like going to the local cider mill. The few annual or semi-annual trips they have been on, have been to places like Canada, northern Michigan, Disney World, Europe and Mexico. Many of the Colby and Royal Oak children seem to be the victim of a trend in American society that, not only requires both parents in a family to work, but also requires them to work longer hours. For Bill this means that he gets to school early and gets picked up at 5:30 pm, when many of his friends have long left for home. For Melissa this means that her family does very few things together as a group. There is another side effect of this trend, and that is that after a long day of work, their parents are tired and can not always find the energy to talk with their children. Like Rumeal and Lashante, Melissa and Bill do not get to spend much quality time with their parents.

Fortunately for Bill and Melissa, their neighborhood offers lots of distractions and attractions. Both ride their bikes around the area, both have friends in the neighborhood -- although Bill complains that there are too many old people in his development who don't have any kids and that his friends from school live far away -- and both play games such as "catch the flag," "hide and seek," and a variety of ball games in the local park and recreation areas. They both feel safe in their neighborhood and their parents allow them to go anywhere they want to as long as it is not really far away from home (e.g. not more than ten blocks away or beyond a major street). I ask Melissa where she is allowed to go in her neighborhood on her own:

Melissa: "Usually, I am just allowed to go, you know, I am at the age now that I have (....) a lot of responsibilities to look after myself, but then ...if I am with friends that are my age, we can go just about as far as we like to. Like to the other park which is about ten blocks and then if we were going further we'd have to get permission from my parents."

Arjen: "Do you feel safe in your neighborhood?"

Melissa: "Yeah, I do. I feel real safe 'cause I know a lot , I know most of the people in my neighborhood. 'Cause I've lived there since, you know, since I was born. So I know everybody and if I don't, we'll go.... well, you know, we understand the

people 'cause it's not a very crime [ridden] neighborhood or... so I feel really safe."(DMS_F_3).

Their feeling of safety and their curiosity, makes it possible for children like Bill and Melissa to explore their surroundings either on their own or with friends. For Bill this means that he can follow a deer track in the woods near-by his house. For Melissa it means she and her girl-friends can go to the bridge across the Rouge River "to throw sticks on the other side and then we'd come under the bridge and we'd look." Both Bill and Melissa spend a lot of time outdoors and both have a "secret place" in the neighborhood where they go with friends just to hang out. Melissa sometimes goes to a little peninsula in the Rouge River and Bill and his best friend sometimes hide in a tree hut they built together in the woods near his house.

When talking about the things they dislike in their neighborhood, Melissa and Bill don't talk about people getting shot, or staying away from gang and drug related activity. Here the contrast is striking indeed:

Arjen: "Are there any things you don't like about your neighborhood?"
Bill: "I like and I dislike having Adams -not Adams- Maple road right, we are real, it's the next block over, that's Maple and you go all the way up my street then you hit Adams, and I don't like those two big streets right there, but I also do like it 'cause there's a lot of stores on them."
Arjen: "Are drugs a problem in this community?"
Bill: "No, I don't know anybody who does drugs. There's no drugs in like Birmingham. It's pretty much a clean place 'cause there's a lot of people that are active in the community who really care about it." (DMS_M_2).

Arjen: "Are there any things you dislike in your neighborhood? Things that you'd like to see change?"
Melissa: "I don't like to see that, you know, there's problems, like trees, you know, they've diseases. I don't want to see all those trees gone, wiped out on the face of the earth. I would like to still have a lot of trees 'cause those trees are slowly going away, but I also like, you know, I would like to have for my children even a safer environment, you know, 'cause there's always still fear that, you know, there's gonna be a kidnapper or that I'm gonna see somebody that, you know, wants to kidnap me.
'The only [other] thing, I guess, is that my street goes down on a hill, like in Winter time it gets icy and it kind of scares me 'cause the cars don't really [stay on the road]. There's always teenagers moving around. They [the drivers] don't always think to slow down on the hill."(CMS_F_5).

Bill: "Well [my house] has forests around it and I live on a lake. So there's people that are starting to cut down the forest and put shopping centers there. So they are starting to ruin it."
Arjen: "Why do you say they are ruining it? Don't you like shopping malls?"
Bill: "I like'm, but because all the animals around there they don't have anywhere to go."(SDCD_M_3).

Bill and Melissa's neighborhood concerns are not life threatening concerns such as expressed by Lashante and Rumeal earlier, but are nonetheless real: too much traffic on certain streets, lack of bike paths, an occasional burglary in the neighborhood, a new development going up nearby, animals that get run over by cars, and people throwing beer cans from their cars, those are the kinds of things they sometimes worry about. The above questions were asked early on in the interview and might illustrate their anticipation of what they thought I would like to hear in their responses. It was not until later that in the interview that I felt assured that they were telling me what they really thought.

The absence of safety problems and gang and drug related activity in the neighborhood -- although some of their peers do suspect there are drugs in the neighborhood -- is reflected in the kinds of problems they see in the world as a whole as well. While Lashante and Rumeal's local community concerns penetrated or overshadowed their global concerns, this is hardly the case with Melissa and Bill.

Bill's initial reaction to my question about any problems he sees in the world today, appears to reflect a self-centered look at the world. It is not until I prompt him further that he begins to express some more global concerns that he has.

Arjen: "When you look at the world today: what are the major issues for you? What does concern you, and it doesn't have to be environmental issues, but it can be, what are your major concerns?" [Note that I am almost steering him away from environmental issues in a conscious effort to get a more genuine response...]
Bill: "Right now in winter, my most major concern is snow boarding. That's my most major right now. I have been looking at some other things... I don't know, like school, we just had mid year exams, that was one major thing and the next thing will probably be my science project. Mostly it revolves pretty much around school and in summer there's not something really too important, just camp." (SDCD_M_4).

Arjen: [But] when you look at the big picture, you know, the world today, what are the major problems you see in the world today?"
Bill: "Pollution, I am really scared about pollution and nuclear fall out. I am not really worried about war, like with guns and everything, as much as, like, nuclear war. I mean, nuclear war would be horrible 'cause it doesn't just kill the people, it kills their dogs, their cats, the old lady that's going to the market or something. The unsuspecting people; people that didn't do anything wrong."
Arjen: "Do you see a war threat today or....?"
Bill: "Yeah, terrorism. Like that plane that blew up over Scotland. All those things, it's scary. Yeah, and the skin heads and, and racial prejudice groups like the skin heads and Nazi's and the Ku Klux Klan and all those. I don't like that stuff."(DMS_M_2).

Bill's concerns about pollution, war and, to a lesser degree, racism are shared by many of his peers at Colby and Royal Oak school, including Melissa. I found it particularly striking that many of the students see war as a threat. The interviews took place prior to the Persian Gulf war and in the midst of dramatically improved relationships between East and West, and the ending of the cold war. Their war related fears varied from nuclear bombs destroying the world and Libya and Panama forming a pact to attack the U.S.A., to the so-called war on drugs reaching their community. Both Melissa and Bill told me that there are enough bombs to blow up the earth several times over. Although they do not think that there will be a World War III, they do worry about the stability of the people who can literally push the button. Bill talks about the kind of world he sees for his children, twenty years from now:

Arjen: "Do you think the world will be better or worse for your children?"
Bill: "....Worse, a lot worse. If (we won't) stop polluting there's gonna be more problems, there's gonna be more wars. It's like a time bomb; everybody get mad at each other and nobody can take it anymore. So the president is gonna go, get really mad and press the button. He'd be crazy. Everything would be gone."
Arjen: "It sounds like you're rather pessimistic about the future. Is there anything that could turn that around?"
Bill: ".... A president that will take action, not be a wimpy or anything (....). He'd say: 'Russia is not gonna come over and conquer us if we'd take down our nuclear defense!' It's unrealistic, they wouldn't do that, we are friends with'm now and just..., if we got rid of our nuclear weapons, I am sure they're too. He's gotta make his stance. They're not gonna nuke us if we get rid of ours. It's stupid."
Arjen: "And then what? Suppose we wouldn't have nuclear weapons?"
Bill: "That would ..... a lot of stress would be released. Countries would trust each other a lot more and.... and then nuclear weapons are gone and we could probably join with other countries and become a huge nation or something. That'd make a big nation!"(DMS_M_2).

Melissa appears overwhelmed by all the bad things going on in the world. She thinks they tend to dominate the good things that are also happening. She is concerned about things affecting the environment such as global warming and pollution, fights between countries and governments, races and religions. She suggests it's just too much and wishes the news would report more of the good news (she mentions people helping the elderly cross busy streets and new technology helping the handicapped). She thinks there are a lot of problems, but that it is not as bad as the media portray it. Nonetheless her big concerns are not unlike Bill's:

Arjen: "..... How about the threat of war?"
Melissa: "Well, I think people will be smart enough not to like nuke the entire world. Things like that, because, unless a really unstable leader got elected or someone who is suicidal or something, I doubt there will ever be a third world war. I doubt there will ever be one. And if there is one, I think by then people would have probably found a way to live on other planets. That still concerns me because then the earth will be destroyed."
Arjen: "Do you think there is still tension between the U.S.A. and the Soviet Union?
Melissa: "I think it's still there because everybody is competing to get ahead. Like in the arms race, you know, they are ahead and we're trying to catch up so that we don't fall behind and then they're more of a military threat. I don't understand why people think like that. I mean why do we have to be on top? Why can't we be both just sort of be.... like, it only takes one bomb to destroy almost a whole nation because, you know, that fall out that they had... the melt down that, you know, the radiation that blew in the wind which spread around.... and it only takes one bomb... why do we have eight million of'm?" (DMS_M_8).

One of the concerns expressed by Bill and Melissa was that of discrimination and racism. In order to get a better perspective of the students from Colby and Royal Oak's thinking about racism and to get to know them better, I would ask them what they thought of Detroit: the way the city looks, their impressions, and the kind of people who live there. The students' view of Detroit and the people who live there are revealing and can help us understand the formation of potentially racist attitudes and prejudices, but also provide an insight into the students' own lives. While reading the excerpts below, it should be kept in mind that virtually all the students I interviewed in Forest Grove and Barnsley had been to Detroit several times to visit the downtown area, but had seldom or never visited a Detroit neighborhood (some who had, had done so only because the driver of the car

took a wrong turn). Most of their perceptions are based on incidental experiences, media coverage of the city, TV movies and hearsay. Nonetheless their views are strong and powerful. Again, I will choose to let the students do most of the talking.

Melissa: "First of all, I know, 'cause I hear about all the bad things and all the people get shot and... lots of ... there seem to be lots more blacks there [in Detroit]. I don't know, but there're a lot of people walking around that don't have money. You really don't usually see bums or people who just sit on the benches here [in Barnsley], but you see them down there and you kind of feel unsafe and insecure. It looks a little more..., not as clean, kind of dirty and there are some bad points to be but... It's like an inner-city with some bad sides so."(DMS_F_4). "It's [the neighborhoods] a lot different, I mean, I kind of feel sad for the people who have to live there because it's so, well, they don't really, I guess it's not that ... they care, but it doesn't seem like they care quite as much about the environment and there's so many run down and deserted houses and stuff like that and I guess..., well, it's just not as well kept as it could be." " I kind of feel sorry 'cause when I go to parades that are on the streets of Detroit, the houses are all, like some of them are burnt, their grass just is not even grass anymore, it's just dirt and it's a real polluted area. Not that Barnsley is not polluted, but it's a lot more, you know, not as dirty as Detroit."(DMS_F_5).

Arjen: "Who do you feel sorry for? Why do you feel sorry?"

Melissa: "I feel sorry for the people that live there 'cause I'm, ... I'm not poor, I'm not rich, but I'm... we have like money, we're safe at home, good community, friends in our neighborhood and the way I see them living.... It's sad for them not to be able not to go out and play on their bikes or go to the park 'cause it's not safe and they know it. 'Cause there's no parks, it's just mainly streets."(DMS_F_3).

Melissa has vivid images of Detroit depicting a grey city with lots of problems that seem to be the result of a lack of money, people not caring about their environment as much as the people in her community do. She associates the city with lots of "black people" many of whom are bums: people who just sit on benches. She thinks the city is not a safe place to be and she expresses compassion towards the children of Detroit who can't ride their bikes to the park because of lack of safety and lack of parks. Melissa feels strongly that the situation the people of Detroit find themselves in is not very good compared to her own living conditions, but she is comforted by the thought that people like her parents, people who live outside of the city, are trying to help in any way they can:

Arjen: "What do you think causes poverty? That's a tough question..."
Melissa: "Well, you could may be say that there's, you know, there's a lot of things, like ...the population is really growing fast. Not just, not really the U.S. 'cause we're a developed country...."
Arjen: "Are there too many people in Detroit?"
Melissa: "....I think there is because you can see as we drive by in Detroit, you can see just a lot of bums and people, but we're building more and more, you know, more rooms for and food for people that are like out of the money that my parents make. There's a certain amount taken out for, you know, like the *opposite of us* [emphasis mine] that are just like, you know, have no money to take care of them[selves]. So we're kind of... We don't have that much poverty anymore because we're taking in a lot of people in buildings..."
Arjen: "Do you think there're homeless people in Detroit?"
Melissa: "Yes, I do. I know about it for fact."
Arjen: "Have you heard of vacant houses in Detroit?"
Melissa: "Yes, but.."
[
Arjen: "So there's homeless people and there's vacant houses! I don't understand... may be it's that I am from another country and I just don't understand. Why is that?"
Melissa: "It's a lot of things. Wives kicking out husbands because of alcohol or, you know, things like... Just think, you know, even women will be kicked out and there's always gonna be someone that could abuse their children or somebody could run away or they could get fired and they don't have any other home, you know, that they can use their money with. So there's always gonna be a certain amount of people, but we're fighting to have it, you know, to try to get more jobs. You know, not that they're gonna love their job or like it a lot, but it's some way of, you know, them earning money to live. So that's why, kind of, there's people homeless and then there's people that, you know, like men that drink alcohol and that have a family to provide money, food and shelter. If they get kicked out of their job or they don't, you know, they are fired or they quit, that kind of -- if the woman doesn't work -- that's kind of like the end for them."(DMS_F_3).

The above dialogue is revealing in many ways. First of all Melissa describes the people of Detroit as the people "opposite" of us. With that she means people who do not have money to take care of themselves. Secondly, she tells me several times that *we* are helping: "we're building more and more," "we're taking in a lot of people" and "we're fighting." With their tax dollars and the charities they contribute to, Melissa believes her parents are helping the people of the city of Detroit in getting a home and in taking care of themselves. Thirdly, Melissa thinks that homelessness, alcoholism, child abuse and run-away kids, unemployment are all related and all contribute to the situation the people of Detroit find themselves in. She clearly associates these problems with Detroit and appears to suggest that they are not problems in Barnsley.

During the entire dialogue she -- and so do her peers, partially I suppose because of the nature of my questions -- speaks of "they" and "we" and "us" and "them" which is bound to contribute to the creation of a "black and white reality." Bill's outlook on Detroit is quite different from Melissa's. Like Melissa, he too, is compassionate and feels sorry for the people and particularly the children of Detroit, but he does not make the "us" and "them" distinction as much and consequently does not suggest that "we" are helping "them." The following excerpt shows Bill's dislike for racism and prejudices, his belief that low self-esteem and lack of education are the roots of poverty and pollution, and his discontent for the Mayor of Detroit who, in his opinion, is part of the problem.

Arjen: "Is there any [racism] going on in this area?"
Bill: "There are prejudiced [people]. There's prejudice in our school about black people and there's a lot of people making fun of Polish people, I don't know why. but all the jokes are based on Polish people in Michigan. In California it's on Mexicans 'cause my dad lives in California."
Arjen: "Do you think... why don't you appreciate that... what's wrong with that do you think?"
Bill: "Like a person who says the joke would probably do that, not the Polish person. .... Einstein was Polish, smartest man in the world!"(DMS_M_2).

Arjen: "How is Detroit different from here?"
Bill: "People aren't educated about pollution and there's a lot of it. And they re-elected Coleman Young. There's a whole bunch of old people who aren't educated who say like: 'Well, I'm gonna be good and I'm gonna vote Coleman.' They don't know really what he has done. 'Cause he's (pretty corrupt). ...And if the new guy had a chance, the new guy is gonna do better, but they don't know that. Coleman (built) the incinerator instead of like fixing housing projects. He gets like a new car or a bigger house, more security guards, more money in his pocket...."
[
Arjen: "Why do you think people there are less educated than they're here?"
Bill: "...Gosh, Coleman he's not, he doesn't give like... The kids they don't have enough self-esteem so they sell drugs or they don't think they can do something better with their lives. They can! ...They need to be educated about pollution and what they're doing and it's not real.... Be cool! You don't be a rebel and try to pollute and say: 'Hé, hé Coleman. Look what I'm doing here.' 'Hey GREENPEACE, look I'm gonna kill a cat or something.' It's stupid."
Arjen: "What are the kinds of problems in the inner-city?"
Bill: "Ehm, kidnapping, there's a lot of that. I've never had an encounter with a kidnapper or anything, but they always have these things in the mail: 'Have you seen me?' They say their name and all these things, everyday there's like a kidnapped kid."
Arjen: "You said drugs; is that a big problem there?"

Bill: "Yeah, why would you wanna use it in the first place? It kills your brain and then you're not smart. It makes you dumber. Probably, there's so much stuff better to do like; play sports, or earn some money for yourself so you can spend it on other things besides... so you have some money and you're not always spending it on drugs. I don't care if people do drugs, but if they expect me, when I'm older, for my taxes, to take care of them when they're in the hospital 'cause they overdosed. Forget it! You use drugs in your own time if you've got money to support it, you're not gonna be my problem."(DMS_M_2).

Bill's relatively tolerant view of drugs ("I don't care if people do drugs, [as long as they] do it in their own time... and have the money to support it."), is not shared by most of his colleagues. Perhaps a more typical view is the one provided by one of his classmates. I ask Roger whether people who use drugs should be punished, helped or both:

Roger: "Well, I think the ones that want help should get it. And, also, they should be urged to and if they won't cooperate, I think people should confine them and let them keep taking drugs 'cause: a) it will kill them, and, b) they can't kill anybody else if they're confined."(DMS_M_7).

Bill's views on prejudices and racism returns when we talk about the photograph showing an alley with an tipped over garbage container and lots of garbage on the ground. Note also that, as he did earlier, Bill makes a connection between the living conditions of the people of Detroit, poor education, low esteem, and pollution.

Bill: "...Trash cans that aren't empty. People who don't care, just let their garbage go out. Like the trash man won't come and pick it up or something. Dirty house, 'cause people, they're not trying hard in life, they don't have enough self esteem or something."
Arjen: "Where could it be? Could that be in Barnsley or...?
Bill: "That could be in Barnsley. That could be in Detroit. Most likely Detroit 'cause people are prejudiced and they won't give black people a chance. That's not very nice."
Arjen: "They won't give'm a chance to ....?"
Bill: "Like if they come into a job interview and they've got a black guy and a white guy and may be the black guy is even more educated, they won't let the black guy in 'cause they're prejudiced 'cause he's black."(DMS_M_2).

Bill appears to be aware of many of the issues that affect at least some people in Detroit. He seems to suggest that the disadvantaged position these people are in is not always in the result of their own behavior, but often the result of larger issues that affect the people collectively (racism, lack of education, low self-esteem, lack of services). It is interesting to see how he is

able to put things in perspective and how diplomatic he tries to be in his responses:

Bill: "In my neighborhood, you know, if there's a broken window it's fixed. You go down to like "Mascot" or something and buy a new window to replace it. But in Detroit they, I mean, if you look at some of the run down buildings... they are just boarded up... It's sort of sad to see all the poverty and things down there. And I know that's not even an extreme thing.. concern, you know. When you think of like all the other places like Ethiopia and those kind of places where that [a Detroit neighborhood] would be very nice for them. It's real bad for us."

Arjen: "Does it affect you in any way, poverty in Detroit?"

Bill: "It affects me, like how I think about things. Like I think, you know, I mean some people don't even have this... And I think it's bad and other people would think, you know, 'great,' and that affects how I think and feel about things, but it doesn't affect me when, you know, when I go buy something or something like that."

Arjen: "Do you feel safe in Detroit when you go there?"

Bill: "No, 'cause you hear on the news of all the killing, just because they got in between two gangs. Or, and you even see in like the movies, like go to Detroit and they come out and they're all like dead. I mean Detroit is not a happy place. And there's like all the crime and the drug houses and things like that, that you hear of on the news. I'm sure that it's not as bad as they portray it in the news. There are probably a whole lot of people down there and they've probably a whole lot of 'm that are doing drugs, but they're not in the crack houses and not burning down places, but it happens often enough that it is one of the main stories and they go in great depth about it. So you think that's how it is everywhere in Detroit. So it's not as bad as some people think, it is worse than some [other] people think..."(DMS_M_8).

How do students like Bill and Melissa see their own role in addressing some of the concerns they have identified? Do they, like Rumeal and Lashante, have a distrust in authority and the justice system? Do they think that they as individuals can do anything to affect events around them? Do they look for careers that can begin to address some of the problems in that they see in the world, like Lashante who wants to become a lawyer and even President of the United States? Do they have certain "goals" for themselves and a "plan" to achieve those goals, even though they are still children who should not have to worry about their careers at their age. The answers Bill and Melissa provide to these kinds of questions show that they have high self-esteem in that they think they can achieve anything, that they have clear goals for their future and even a strategy to achieve those goals, that school is the main instrument to reach those goals and that their parents are a major driving force behind setting those goals and being successful in all that they

do, either by giving their child explicit messages to that effect or just by example or both. I ask Melissa and Bill whether people like themselves can affect change in the world, for instance, when it comes to fighting pollution which they -- as well as their peers from Barnsley, Forest Grove and Detroit -- see as a serious problem.

Melissa: "[In the future] we hopefully will have more understanding of the earth and people. And I think that, like what I just said, that people won't get the message, you know, if we want our kids to live and we want their kids to live too, we have to somehow all get together and work on this."
Arjen: "Do you think that you as an individual can make a difference in the world?"
Melissa: "Yes, I do. 'Cause as, right now I'm contributing to my community and I am doing the best that I can to tell people, you know, let's go pick up some newspapers in the park or trash in the park, you know. That's just a little step for me as a twelve year old, you know. As I age I'll be able to do more things concerning the environment."(DMS_F_3).

Bill also thinks that he as an individual can make a difference by changing his own behavior, influencing people around him and by getting organized. He is convinced that even the little bit of pollution he prevents by changing his own behavior will make a big difference. He even sees himself as a potential initiator or leader in cleaning up the environment. Like many of his peers, he points at the advantage and need of being educated:

Arjen: "Is there anyway you, as an individual, can make the world better? What could you do, if anything?"
Bill: "Stop polluting, it's a great difference if I just stopped myself. If I could get everybody in my neighborhood to stop, that would be a lot of pollution gone. And neighborhoods to get [other] neighborhoods and everything. You need a leader. I could start something. May be I could start a pollution free revolution. To get everybody to stop would be a great thing."
Arjen: "When you look at your school; students your age, do you think they are aware of what's going on?"
Bill: "Most of them, but some will think: 'Who cares if they're gonna spray paint something.' I mean, like, I tell'm: 'Don't spray paint, you're ruining the ozone and everything.' They go like: 'Oh really! This little bit is gonna hurt?' And I've uneducated friends about this. You need to educate everybody about this. You need to educate everyone about it." (DMS_M_2).

At first, I had a hard time picturing Melissa say to her friends; "Hey, let's go pick up some newspapers in the park or trash in the park," and hearing Julian tell his friends; "Don't spray paint, you're ruining the ozone and everything," as a result of the phenomenon described earlier which raised some doubt about the sincerity of the students' responses in light of

their awareness of the supposed "right" answer. But, from the intonation of their voices, the expressions on their faces and the level of concern, I did not doubt their sincerity of their responses to the more reflective questions. Perhaps one of Melissa's classmates' responses to my question whether pollution will get better or worse in the years to come, is illustrative of this honesty:

Rob: "I don't know... I hope it's not too far beyond help, but I do think what has to happen is; everybody has to do something about it instead of just saying: 'Well, let them do it because they can do it for themselves and for you'. And there're so many people that have that lazy attitude... I myself, I have to admit, I am one of those people sometimes and, you know, you can't have that attitude 'cause it doesn't work, it doesn't get anything done."

Arjen: "Do you think that students in your school, your age, realize that there is a problem? Are they aware of the problems?"

Rob: "We are aware of the problems, we're just too young to do anything about it."

Arjen: "Yeah, you think so? Do you think at some point you'll be able to make a difference?"

Rob: "There will be a point, but I don't know if people will use that point."

Arjen: "...Okay, so you think that people will get an opportunity, but you're not sure whether they'll take it...."

Rob: "Yeah."

Arjen: "What's more important to those people you think?"

Rob: "Their own personal benefit from things." "Like: 'what will I get out of it if I help someone who is in need, you know, if I help some poor people, what will I get out of it.' For most people a good conscious and satisfaction is enough."(DMS_M_8).

Note that Rob's outlook is not as optimistic as Bill and Melissa's: he sees most people as being shallow in that they only need a clear conscience and satisfaction, and he thinks that children his age are too young to affect problems like pollution. There is definitely a split between the students of Colby and Royal Oak schools that is not along school lines. While most students I interviewed think they can make a difference, there are also those who think they are too young and that changing the world, however small the change may be, is the task of adults.

Many of the Forest Grove and Barnsley students put a lot emphasis on school and getting a good education. Getting good grades in school to many is a major concern. Their parents have gone to college, they already have a profession (engineers, scientists, medical doctors, journalists, artists) in mind they would like to pursue and they know what college they want to attend

and some even know what kind of GPA or SAT scores are needed to get to that particular college. I wanted to find out, given their concern about environmental issues (see Chapter V), whether they would be willing to sacrifice their good grades and school if that would safe the environment, by asking them a purely hypothetical question:

Arjen: "If you had to choose between good school results and a clean environment...?"
Melissa: "I don't know, I'd pick both, but probably a clean environment because that will affect everybody and my children and their children, and my school grades only affect me...."(SDCD_F_6).

Arjen: "If you had to choose between good grades and a clean environment: What would you choose?"
Bill: "Clean environment. Because if I do poorly then that would be fine if the rest of the world is doing better."
Arjen: "But suppose you're not educated; would you be able to do something about it, about pollution?"
Bill: "Yeah, you still could. Like you could, instead being one of the organizers, you could be one of the workers. I mean there're still options for people that aren't educated. Like there's a whole lot of volunteer things that you can do that don't require an education." (DMS_M_8).

Posing some of the students for this moral dilemma and basically forcing them to make an unrealistic choice, does reveal something about their thinking. Both Melissa and Bill unselfishly put the earth and other people first which surprised me in light of the competitive and individual oriented school climate in which they find themselves.

Although there is a split among the students about the extent to which they think they can make a difference in their community environment, there appears to be a general consensus about the direction society and the world is heading. Virtually all the Barnsley and Forest Grove students I interviewed would respond with pessimism when I asked them what they thought the world will look like twenty years from now. Again, I should point out the diplomacy and caution with which Bill and Melissa approach my questions:

Arjen: "Suppose you're your parents' age and you have children of your own, what do you think the world will look like for your children? Would it be better or worse?"

Melissa: "That's kind of hard to say because everything is going, like, in different directions and there's places that are getting worse and there are places that are, well, trying to get better. I think this area, it could really, it could get worse, but it's kind of hard [for it to get better] 'cause it's so nice already. It couldn't get a lot better, but it really could get worse 'cause it's such a nice neighborhood and, well, I think Detroit is either gonna get a lot worse or it's gonna get better, and like I said, I really hope it's gonna get better 'cause, I mean, it's kind of hard when people live in such a nice state and then there's just an area that is just kind of... It's just kind of depressing that such a nice state has an area like Detroit." (DMS_F_5).

Bill: "I think it's... I hope it's better, but I think it's gonna be worse..." "Because every generation can only do so much and, you know, the generation that's in control now isn't doing, in my opinion, anything effective. They may be helping the pollution and things like that, but it's not enough to affect the amount of pollution and things like that and I hope it gets better, but I don't think it will." "Well, what happens is, you know, you solve problems and new ones arise. It's just gonna be a continuant cycle. I mean we'll be able to solve problems, but from solving those new ones will come up. I mean we're always gonna have problems..."
"I think there's always gonna be environmental problems. ...You need a lot of people to work on minimizing environmental problems 'cause, I mean, it will take a lot of people, everybody's cooperation. You know, a lot of people aren't willing to do that."(DMS_M_8).

Arjen: "What kind of problems are you talking about?"

Bill: "Everything; the drugs, the environment, cutting down the rain forests, more pollution and stuff."

Arjen: "You don't think that at some point that will turn around?"

Bill: "At some point it should. It must, it's gotta turn around sometime, but [it won't] for a while."(SDCD_M_4).

It is rather frightening to see that Bill and Melissa have such a pessimistic view of the future. The question arises to what extent this perspective affects their lives existentially. Although, it is difficult to say much about this based on forty-five to fifty-five minute long interviews, it appears that their concerns must affect there lives existentially at least to a degree. The fact that a few students would rather not have children, would like to move to Canada or Colorado where it is still "pure," and the fact that some students are at least playing with the thought of pursuing an environmental career, testifies to that. These may be small facts, but to borrow a phrase from Geertz, small facts speak to large issues (Geertz, 1983).

In completing the thin slices of the lives of Bill and Melissa, I will put forward the things they find important in life. It is interesting to see the importance of family in their lives, something which Lashante stressed

earlier as well. With the exception of only a few of the Colby and Royal Oak school students I interviewed, all the students point at the importance of family togetherness and support, regardless of whether their parents are divorced or not.

Arjen: "What things are important for you in life?"
Melissa: "I would say probably like my peers and my family. And how, like, our relationship and how we take care of each other and how our love for each other and that kind of reflects on [affects] how we live and we want each other to always be together and I guess that's really important to me." "I just want everyone to be happy, kind of, like if I pray to myself at night... 'Cause I kind of get scared sometimes, if I think my mom dies or something happens." (DMS_F_4).

Arjen: "What things are important to you in life?"
Bill: "My friends, my family, my animals, ...making people happy and not have to worry about things. That's.... I have to worry about pollution, I have to worry about all that stuff. I don't wanna worry about that. In Canada like when I'm living alone, there's nothing to worry about."(DMS_M_2).

At the end of a chapter that is made up of descriptions of children's lives, the way they think about issues that affect them, their outlook on the future, the role of school, the way they use and value the physical surroundings of their home, family trips they take, and other aspects of their existence, it is both tempting and difficult to make a comparison between the lives of Rumeal and Lashante on the one hand and the lives of Bill and Melissa on the other. It is tempting because some differences are quite striking, but so are some of the similarities. It is difficult, because, as suggested earlier, the composite portraits do not represent or reflect the lives of all the students in Barnsley, Forest Grove and Detroit, not even of all the students interviewed. A comparison therefore, would only be a comparison between the composite portraits and not between the lives of children growing up in the "inner-city" and those of children growing up in the "suburbs." It is not my intention to perpetuate myths, but to unveil them. With that in mind I will make some comparisons bear relevance in the larger landscape of students perceptions of nature and environmental issues in the context of environmental education.

Having looked at some aspects at the lives of Bill and Melissa from Barnsley and Forest Grove, within the constraints discussed in the

introduction, it becomes clear that their lives and concerns are both different and similar when compared to the lives of Rumeal and Lashante. Different when we consider the urgency and the direct impact of the problems and concerns Rumeal and Lashante face on a daily basis. Their worries about neighborhood violence, drugs and crime affect their lives existentially: it limits their mobility, it affects their family life, their recreation and play, their interaction with other children, their faith in others and the "system" and the list goes on. Rumeal and Lashante, also worry about the concerns that dominate those of Bill and Melissa. They too, as will become clear in Chapter V, worry about pollution, they too worry about succeeding in school, albeit for different reasons.

Both Bill and Melissa feel sorry for Lashante and Rumeal, even though they don't know them or have ever talked to them. They think that the people of Detroit, of whom they think of as one entity, live in a depressing environment with lots of violence, homeless people, drunks, lack of education. Bill thinks African-Americans are discriminated against when they apply for jobs and therefore are not given a chance. Melissa thinks that by paying taxes people like her parents help the people of Detroit by building houses and making it possible for them, or as she says "people opposite of us," to take care of themselves. Lashante and Rumeal believe Caucasian people discriminate against African-American and Lashante even mentions the continued lynching of African-Americans in the South. They both think that people in suburbs like Barnsley and Forest Grove have similar problems to the ones they have in their community, but that they are much better at hiding them because they don't betray each other, they don't publicize it, and they know how to bribe police and judges.

Melissa and Bill both are pessimistic about the future, while Rumeal and Lashante are more optimistic. Melissa thinks it will be difficult for things to get better, since "everything is so nice the way is is now." For Lashante and Rumeal things can only get better, provided they take charge of their own lives and become somebody successful. All three Lashante, Melissa and Bill, believe that it is important that people work together in unity in solving the world's problems. For Lashante, working in unity is the key for African-Americans to improve the situation in which they find themselves. She

thinks African-Americans today are out of unity, whereas Caucasian people are in unity. Melissa and Bill do not consider Caucasian people to be out of unity, but they do think that they don't work together in improving the environment. Working together or in unity obviously has a different meaning to them.

All four students seem to believe in their own capabilities, appear to have high self-esteem and think they can make a difference. But, whereas Melissa and Bill have a supportive environment in the form of school and encouraging parents, as well as a plan or strategy to achieve their goal of getting a college education and a good job, Rumeal and Lashante only have the goal which appears to be more like a dream. Melissa and Bill's social environment pushes them towards their goals, while Lashante and Rumeal have to fight their social environment and work against the grain in order to get anywhere close to their goals.

Physically, Melissa's and Bill's surroundings are different from those of Lashante and Rumeal, but more noticeable than the physical differences -- although less colorful, Lashante and Rumeal also have parks, back yards and play grounds in their neighborhood -- are the social differences that determine the degree in which the physical surroundings are used and the extent to which they form an integral part of the community and the lives of the children. Bearing in mind the slices of the lives of Rumeal, Lashante, Bill and Melissa, I will now turn to the main subject of this dissertation: the perceptions of nature and environmental issues of the students from Barnsley, Forest Grove and Detroit.

CHAPTER IV
YOUNG ADOLESCENTS' PERCEPTIONS OF NATURE

4.1. Introduction

"Nature is growing, in motion, alive... Ponds, animals running wild, cattails... Being on your own. Not being able to go home and turn on the TV." (Latoya, 13-year-old girl from Detroit (HMS_F_5).

In the evolution from nature-conservation education to environmental education, the emphasis on the importance of people's experiences with nature in developing environmental awareness and the willingness to act responsibly towards the environment has shifted back and forth. Simplified, the pendulum has swung between two extremes. The one extreme is the view that without nature experiences people will not come to appreciate and value nature. Since people are less willing to preserve or conserve what they do not appreciate or value, any environmental education program that not provide students with nature experiences is likely to fail (i.e. Viëtor, 1985; Huitzing, 1989; Margadant, 1990). The other view is that given that we live in a severely polluted, urbanized world that requires immediate action, environmental education needs to focus on environmental problem solving. In this view, nature experiences are enjoyable and nature conservation is important, but if we are going to do something about overpopulation, acid rain, depletion of the ozone layer and the greenhouse effect, we need to directly address the local manifestations of these global problems in our schools (i.e. Anderson et al., 1990; Breiting, 1990; Gigliotti, 1990; De Jager and Van der Loo, 1990).

In a Hegelian manner we now seem to have come to a position that synthesizes both extremes at a higher level. Nature experiences and people's

perceptions of nature are an essential part of environmental education, but only when connections are made with everyday life and the environmental challenges people face as individuals and as society as a whole. When these connections to the so-called "bigger issues" are made depends on the context in which the education takes place as well as on the prior experiences of the learner. The dominant literature and existing environmental education curricula suggest that young children are more susceptible to things like nature walks and learning about animals in a hands-on fashion, and that, as children grow older, they become more ready to make connections to global environmental issues and make responsible decisions regarding their own environmental behavior.

Within this framework, students who are part of this dissertation would be somewhere in between: too young to see the big picture and be burdened with adult problems, yet too old to enjoy nature walks or animals, or, perhaps, very confused. In the *awareness to action model* in environmental education (i.e. Shirman and Conrad, 1977), nature experiences are important for enabling young people to develop the sensitivity towards the "natural environment" which will later on in life lead to their willingness to protect the environment. This chapter explores the kinds of experiences young adolescents have with nature, what they perceive to be nature in the first place, and how they value nature. This exploration may lead to a better understanding of how different environs and personal histories influence the quality and quantity of nature experiences, how students' perceptions of nature relate to those of environmental educators and curriculum developers, and, finally, the role of nature experiences in environmental education.

First, we must examine what we -- environmental educators -- mean by "nature," for it is often the prototypic image of nature adults hold that is at the core of environmental education curriculums. A close look at this prototypic image of nature, put in a historical context, is warranted for only then can we see how students' own images of nature show differences or similarities to those of adults.

4.2. The Nature of Experience and the Experience of Nature

The American College Dictionary provides two definitions of nature that form a good starting point for a discussion of the relationship between the nature of experience and the experience of nature in the context of this study:

1) *"Nature is the material world, especially as surrounding Man and existing independently of his [her] activities."*
2) *"Nature is a primitive, wild condition: an unculitivated state."*

One could argue that defined as such nature does not exist for the people in Detroit and its suburbs. The air they breathe, even when they travel far away, has been affected by human activity. Pure, untouched nature, free of human influence no longer exists. "If you take into account our impact on climate, the oceans and the atmosphere, nothing is unaffected. Even in the crust of the earth we tap reservoirs of water, fossil fuels and raw materials on a huge scale. In space you would have to travel far away to escape the cacophony of radio waves emitted by civilization. The environmental impact of humanity is ubiquitous. We are immersed in culture and there is no escape." (Westbroek, 1991).

A gloomy perspective? Technically Westbroek is right, yet we continue to talk about "nature preserves," "nature hikes," "nature trails," and "nature conservation" which really are contradictory concepts since they all occur dependent upon our activities. We all seem to have experienced nature, at least we have heard about it, and as a result we do have a picture of nature in our minds. To most people the image of nature is a positive one that includes beautiful scenery, plants, wild animals, trees, different colors and smells. In many countries there are groups, organizations, governmental bodies and individuals dedicated to the conservation of nature. Particularly in those countries where there is not much "nature" left. There seems to be a high level of agreement among people that nature should be preserved. There is disagreement about the *how to* and the *how much*.

Historically in the Western world, nature[1] was not always looked upon in a positive light. On the contrary, nature posed a threat and represented the land that still needed to be conquered or cultivated by humankind. In medieval times the cities embodied civilization and anything outside them represented darkness and wilderness. Huitzing[2] points out that in medieval paintings there are few pictures of landscapes and those that were depicted religious scenes and were not painted to show natural beauty. It was not until the Renaissance that landscapes were painted to show their beauty. Nature scenes were demystified and it was this demystification of the space outside of the city walls that gave birth to the concept of nature. It was in the Renaissance when Petrarca climbed Mont Ventoux for no apparent reason other than to climb the mountain because it was there. What to many was regarded as a waste of time, was to Petrarca a valuable "nature experience" that both satisfied his curiosity and inspired his thinking (Petrarca, 1986).

Later in the Renaissance and especially during the Enlightenment, nature became the nature that was the object of study in the sciences. The main idea was that nature held many secrets that needed to be uncovered in order for people to be able to manipulate, control and predict nature. This cybernetic and instrumental view of nature still is part of our world today. We only need to think of the massive exploitation of natural resources, or the metaphors used to describe nature in modern science, and we can see that the notion of nature as a productive machine is still viable.

Thomas points out that it is not until the early seventeenth century that the upper-class citizens of England began to show interest in nature, first to study it, later purely to enjoy it (Thomas, 1983). The argument goes that only those who have secured their basic needs (food and shelter) can begin looking at nature as enjoyable, relaxing and worthwhile spending time in. Forests, lakes and mountains that were the home for demons in medieval

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[1] Nature as a mental construction did not really exist until the early Renaissance. When I say "nature was not always looked upon in a positive light," I refer to those areas we tend to call nature today.

[2] In providing this short description of changing perceptions of nature in recent Western history, I gratefully make use of Dirk Huitzing's work in "Een schepje er boven op!" (English: *Make More Steam* (Huitzing, 1989).

times now become exciting places that form an escape to the worries of everyday life.

In Romantic times the affective, sentimental component of nature dominates the cognitive, rational component that was so important during the Enlightenment. Nature, more than before, becomes a romantic place where one can temporarily hide from the rapidly changing world. Nature becomes accessible to more and more people, including the working class. Even today many people associate nature with romantic experience. As Huitzing points out, this is something that has not escaped the eyes of many corporations who use nature as decor in their advertisements to sell their product.[3]

With the industrial revolution, the new technological and medical advances and the subsequent population boom, the area of uncultivated land decreased dramatically and in many countries nature became a scarce commodity that needed protection. In was around the turn of this century that many nature conservation clubs and organizations were formed, legislation came in place to create national parks and forests, and the field of nature conservation education -- in many ways the predecessor of environmental education -- was born.

In this sketchy historic overview of how the notion of nature has changed over time, I have only considered the Western world. In non-Western countries the notion of nature and its historical context are quite different.[4] Factors that influence the evolution of the concept of nature, including, religious orientation, physical surrounding, socio-economic

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[3] Think of jeeps driving through the wilderness, shampoo with pine-tree scent, a cowboy on the prairie smoking a cigaret, or birds, rocks and trees, companies use as their symbols.

[4] Think of the way many Indian tribes have perceive nature. Chief Seattle's speech ("*Earth does not belong to us; we belong to the earth*") may serve as an illustration of a perception of nature that is far less anthropocentric than that of many Westerners. A word of caution here, however, recently it has become clear that Chief Seatle's speech, also referred to as the "Fifth Gospel" was fabricated for a movie script in 1970-71). Gough even suggests that the hoax can be seen as chiefly Protestant propaganda (Gough, 1991a).

White refers to Zen and Buddhism as mirror images of the pre-dominant anthropocentric Christian outlook of nature which give rise to a very different relationship between people and nature (White, 1967).

situation, colonial past/present, to name a few, are different from region to region. As an example of different cultural orientations towards nature, we can look at the use of language. Helen Watson showed two Australian girls a picture of two beached canoes situated in the foreground with a placid lake or inlet stretching towards the distant mountains in the background. Both girls were asked: "Describe what you see here." Ruth, a native speaker of English, replied: "Canoes are lying on the beach." Binmila, a native speaker of the language of the Yolngu people of north-east Arnhem land, replied: "*Rangi-ngura nyeka lipalipa*" which translates to something like "Beach-on staying canoe." (Watson, H. in Gough, 1991). Gough points out that in the English sentence, "canoes" is the subject and "are lying" on the beach is the predicate. "Subjects, for English speakers, are often objects which are characterized as being separate in space" (Gough, 1991; 31). In Yolngu, the subject of each sentence both names the thing and points to its relatedness. As a result of the different grammatical conventions, Gough argues, English and Yolngu speakers construct very different stories of their experience and understanding of their environments.

The point is that, different from the American College Dictionary's and Peter Westbroek's perspective, it can be argued that nature does exist: it exists in our minds. To say that nature exists independently from us is to say that it is impossible for humans to protect or conserve nature for the mere act would transform nature as a result of our intervention. To define nature as a physical entity might have political and management uses in that it gives legislators, interest groups, environmental engineers and the like a common frame of reference. From an environmental education perspective, however, it makes sense to spend some time on finding out how the concept of nature exists *within* us.

The historical account of how perceptions of nature have changed over time illustrates that "nature" in itself is a dynamic mental construction that is the result of our own interactions with a changing world. One could even say that even though we tend to associate nature with physical surroundings, the concept itself is part of our social construction of reality. Phenomenologists in the social sciences are interested in the lifeworld (see Chapter I) which is made up of people's inter-subjective experiences. Through our meaningful

personal, social and cultural interactions with the world we create our own socially constructed realities (Spiegelberg, 1972; Barritt et al, 1985). The interactions with our surroundings -- which include other people and historical residua -- are both private and shared, dynamic and stable, idiosyncratic and uniform, and lead to the existence of multiple realities. Through dialogue and introspection, a researcher might be able to share a piece of the reality that challenges the participants in a study. It is out of this sharing and the synonymous reflection upon personal prejudgments one brings to the study, that one may reach an increased understanding of the meaning and place of nature in the participants' lifeworld. The concept of nature as it exists in my mind is likely to have elements in common with concepts of nature held by other people both in time and in space: both with people who live elsewhere on this earth and with people who lived in the past and will live in the future. Within all concepts of nature there will be some of, what Wittgenstein refers to as family resemblance: people will have some elements in common, but not all, nor will there be one single element in common to all people (Wittgenstein, 1985, also: Pitcher, 1966).

In the section on the research approach I chose to use in this dissertation, I already have described how phenomenological inquiry can lead to better understanding. The reason I re-emphasize the importance of nature of experience in phenomenological research is to stress its role in shaping the experience of nature. The idiosyncrasy of experience and the contextual realms that bound experience cannot be ignored when studying people's experiences and perceptions of nature. Particularly when considering the contexts of a suburb and a city.

4.3. Personal Pre-Judgments, Biases and Purposes

A main purpose in investigating the way Detroit and suburban Detroit middle school students experience and perceive nature is to get a better sense of the role of nature experiences in environmental education, and to find out whether special consideration should be given to the different contexts in which children grow up. Could students have an image of nature as something that exists independently from their own experience? Perhaps as a

result of biology lessons taught at school or of only having watched nature shows on the Discovery Channel? Or, could they have an image of nature that is based upon an incidental, one-time, experience with nature? Perhaps as a result of a field trip to a forest preserve or a camping trip with the Boy Scouts? Or, could they have developed a very detailed image of nature as a result of frequent visits to natural areas both locally and away from home? Perhaps as a result of having a local forest preserve near by or a family that values trips to the country-side? Different kinds of experiences, or lack thereof, are bound to influence both the perception and experience of nature.

The extent to which nature is part of the lifeworld is not solely determined by our physical surroundings or our mobility, but also by the meaningful interactions we have with our surroundings. People living in the same neighborhood therefore can have very different views on whether there is any nature near their homes. If society as a whole values nature to the extent that it wants to conserve and protect it through, among other things, environmental education, then it would be worthwhile to know whether nature is a valued part of the lifeworld of the learner or just a mere abstraction stripped of any meaning. If it is a valued and meaningful part of the lifeworld, then nature conservation efforts are more likely to get the support needed for them to succeed. If nature is merely an abstract concept, possibly as the result of the depravation of experiences with nature and/or the formal education people receive,[5] then support for nature conservation might very well be lacking or superficial.

Upon beginning the research in the suburban and city middle schools I reflected on the expectations I had about the differences in students' experiences with nature that would emerge in the interviews when comparing city students with suburban students. Without prior reflection on personal biases -- which are often shared -- I had towards the participants and how these biases might influence the topic of interest, the interviews could

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[5] In most biology classes the emphasis is put on the study of elements of nature, not on the study of nature as a whole. Even things such as flowers are discussed by talking about smaller units: roots, stem, leaves, the flower itself, seeds, and at another level, the cells, the tissue, energy transportation and conversion, and so forth. Nature is often portrayed as the sum of seemingly unrelated parts. One could call this "atomistic" or "analytical" nature.

easily have become self-fulfilling prophecies. The reflection revealed some rather common generalizations that deserve mentioning:

- Suburban students live in areas where nature or elements of nature are more present than in the city. Hence, nature is more likely to be a part of the suburban students' lives than the city students' lives.

- The yards of the suburban students are more prominent, better maintained and contain a variety of plant and animal species, bringing nature close to home.

- Suburban students are more likely to have a steady family with the desire and means to go on family trips to natural areas away from home. Hence, suburban students probably frequently visit forest preserves, national parks or a cottage up north.

- Lack of safety prevents city students from going to local parks, while economic pressures on the family keep them from leaving the city.

These four generalizations would suggest that suburban students are more likely to experience and appreciate nature, would be more able to describe what they consider to be nature, and, finally, would be more willing to help conserve nature. Obviously, these generalizations are far too simplistic -- and some of them turn out be wrong.

4.4. Young Adolescents Talk About Nature

Most of the research findings emerged from the analysis of thirty in-depth interviews with students from all four middle schools. Some additional findings are the result of two neighborhood walks with small groups of students from the Detroit schools. In the introduction chapter I pointed out that my main concern was with the Detroit students for several reasons. To repeat those:

• Little research has been done on the way "inner-city" youth perceive environment (including nature) and environmental issues, while there is a large body of research that focuses on "suburban" and "rural" youth.[6]

• Environmental education traditionally has been education for the privileged, e.g. those whose basic needs are met and can afford to worry about or care for the environment.[7] Only recently the issue of environmental education and minorities has received higher priority on the agenda of organizations such as the North American Association for Environmental Education.

In analyzing the interviews I tried to capture the perspectives of the Detroit students, while contrasting theirs with those of the students living in the suburban Detroit communities of Forest Grove and Barnsley. Rather than using existing literature on the perspectives of "white suburban" students, I chose to approach the students directly with the same research technique I used in the Detroit schools. In reporting my findings I will shift back and forth between the Detroit students' experiences and perceptions and those of the Forest Grove and Barnsley students; contrasting them where they appear to be different and mixing them where they appear to complement each other.

In chapter III, I described the context in which the children who participated in this study grow up. The Detroit students vividly described their neighborhood, their dreams and the reality that challenges them. Despite the many problems they are facing (violence, drugs, sexual assault, negative role models, to name a few), they seem to focus on the positive elements in their lives. A seemingly desperate situation is transformed into a world with dreams, prospects and things to enjoy. Many of the students seem to have accepted the problems that face their community and consider it to be part of their life: it always has been and it probably always will be. Remember Lashante who hides in a tire that hangs in the playground when a shooting breaks out, yet speaks very favorably of her neighborhood... Or think of both

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[6] Traditionally most of this research in North America is of a quantitative nature. This becomes apparent when scanning the only research journal in the field of environmental education in North America, the *Journal For Environmental Education,* for research articles on nature experiences and perceptions.

[7] The irony (or, perhaps, tragedy) is that often those people who live in poor, urban environments are also the ones exposed to the bulk of air, water and visual pollution.

Rumeal and Lashante who, when asked where they would want to live when they are adults, say Detroit. Imagine the family life of many of the children: often no father or father-figure, a mother or grandmother who is working hard to take care of her children, the responsibility of baby sitting a younger brother or sister. Aware of safety issues on the street and the risk of hanging out with the wrong people, most students, particularly the girls, spend a lot of time indoors and very little time outdoors.

Does "nature" have a place in the lives of these children? How can they possibly interact with nature? Where do they get nature experiences in such an urban environment? The interviews overwhelmingly show that somehow the students managed to build a relationship with nature. Somehow they do develop a sense and a taste for nature. They are able to see nature in their own neighborhood. Through the sporadic trips to a local park or to places outside of Detroit they have developed a rather sophisticated image of nature. Subsequently, I will discuss the images of nature these students have developed, the sources that enabled them to develop these images, and, finally, the role organized nature experiences could play in the environmental education.

4.5. Defining Nature

> *"[Nature] means like, undisturbed by people, no trash lying around, roaming around, walking through the woods, lots of different colors, quiet, and watching animals, things like that." (Roger, a twelve-year-old from Barnsley (DMS_M_7).*

During all the interviews we touched upon the concept of nature. Usually we talked about the neighborhood, the yard, playing games outside and going on family trips, before I would ask them directly about nature. Talking about trips away from the city or suburb, or talking about outings to local parks or forest areas and students' experiences with animals, made it easy to touch upon their notion of nature. I would usually ask questions like: "What is nature to you?" or "When you leave the city and you go to the countryside, how do things change around you?" Once we got talking about

nature, I would probe further with questions like: "Is a zoo different from nature?" or "Can you find nature in your neighborhood?" At the end of the interview, after talking about problems in the world today, the way the students looked at the future, environmental problems and their solutions, we would return to the concept of nature when I asked them to react to a photograph of two people hiking in a forest (Appendix B). This picture, to me at least, shows nature in all its beauty with people seemingly taking a hike with gear on their backs, suggesting that they might go for a picnic or might go camping.

In this section I will first discuss students' direct responses to the question: "What is nature to you?" In the next section, experiencing nature, I will discuss different types of nature that live in the minds of the students as a result of their own direct and indirect experiences with nature. The sections are distinct, since in trying to define nature students tend to come up with their own rationalized definitions, while in talking about their own experiences with nature, they tend to share more personal affective feelings towards nature as well as the various ways they utilize nature.

4.5.1. Nature is Flowers, Animals, Trees, and it's Alive!

Arjen: "What is that to you: nature? What does that mean?"
Aisha: "When I see nature I see flowers and woods and trees and animals, mostly wild animals, running around." (CMS_F_6).

Virtually all the students, both suburban and city, associate nature with animals, flowers and trees. Several students include the weather in their description of nature. Some refer to snow as a part of nature, others mention the sun shining through the trees.

Arjen: "What does that mean to you; nature?"
Scottie: "Flowers and stuff, roses, when it snows...". (CMS_M_4).

Latoyah: "Yeah, it's fun! You get to see little animals running around and there's a little passage you take through (....) and there's like a little pond there and they have cat tails and stuff like that." (HMS_F_5).

Alicia: "It's all the trees and little animals running around and the leaves. It's fresh clean water in some parts of forest little streams." (HMS_F_1).

A pond, a stream or a creek are part of nature in the eyes of the students. Very few students name individual plant species or give the names of trees. Latoyah's reference to cattails is an exception. Some, not all, of the suburban students are more knowledgeable about different species and, on a more abstract level, of different ecosystems. This largely seems to be the result of their own exposure to different types of nature. The excerpt of Peter may serve as a good example:

Peter: "Canada has got great wilderness. I'd like to go up in the mountains in the Yucan 'cause I saw the movie The Bear and I've seen a lot of wilderness. I'd like to go to Bluff Creek in California or up in Canada 'cause I like, I like Pine Tree Wilderness where there's bears, I don't like Oak Tree Wilderness or something. I don't like.... I wouldn't wanna live in the desert, Wyoming, as much as I'd like to live in the wilderness in Canada. Just to live off, to live off that seems [easier]. 'Cause it doesn't rain very often in Wyoming, once a month." (DMS_M_2).

From most of the interviews it becomes clear that students' knowledge of mammals seems to be more detailed while most seem unable to identify different bird or plant species. Partially this can be attributed to having had more exposure to mammals, either through having them as pets or seeing them on the streets or in parks, and possibly, to their ability to relate to mammals better.

Nature also is green. If it isn't green or alive then it cannot be nature many students seem to say. When I show Maurice a picture of a dirty alley with a tipped-over garbage container, I ask him whether he sees nature in the picture:

Maurice: "No, the trees don't have any leaves and the grass is all .... brown" (CMS_M_1).

Even though the picture was taken in late Fall and of a very urban scene, Maurice rules out the presence of nature by looking at the color of the grass and the absence of leaves. The absence of leaves and the color of the

grass suggest that both the trees and the grass are dead and therefore not part of nature, since nature is alive in Maurice's eyes.

Anna: "Everything outside and living. ...The animals and the trees and the plants."(SDCD_F_6).

Latoyah: "Nature is growing, in motion, alive.... Ponds, animals running wild, cattails...."(HMS_F_5).

Nature as being flowers, animals, trees and being alive, appears to be a core element of the students' perceptions of nature, regardless of the amount of exposure the students have had to being in natural areas such as parks or woods. This finding is not new but emerges from other studies of children's experiences with and perceptions of nature as well (Rejeski, 1982; Viëtor, 1985; Margadant, 1987; 1990).

4.5.2. Real Nature is Pure, Pristine, Peaceful and Not Human-Made

Real nature is pure, pristine, peaceful and deprived from human influences such as pollution and noise from cars and industry. All students seem to have an idealistic picture of nature in their mind:

Bill: "A nice, quiet place to be. It's nice and clean and in its original setting. There's no chemicals and no-one has wasted or burned down anything."(CMS_M_5).

Arjen: "When you leave the city, how do things change?"
Latoyah: "Well, everything seems more quieter and more peaceful. I don't know, it seems to change all of a sudden." (HMS_F_5).

Arjen: "How would you describe nature. What does that mean to you?"
Alicia: "Pure."
Arjen: "How do you feel when you walk there?"
Alicia: "Clean." (HMS_F_5).

Carrie: "Well, it means..., you can see the grass or the snow or animals, anything outside that's not affected usually by Man."
Arjen: "Would you find that in Barnsley?"
Carrie: "Well, it kind of depends on how you look at it, I mean, you see it but then you might change [your mind] because all these new things that happen affect them. It's not really natural, it's something that we have done. But, I think,

> considering how the world is now, there's so much technology that affects the nature. I guess you could say there's little nature, there's not too much city, but there's a lot of buildings coming everywhere, so this I don't like too much." (DMS_F_4).

Carrie seems well aware of how pure nature is being threatened by humans who with their technology expand urban areas at the expense of nature. Many of the suburban students talk about nature as endangered territory (See section 4.6.8. *Nature as a Threatened Place*). In his description of nature, Peter does what many students do: he first describes nature as a pure, unpolluted place existing independently from humans -- which made me believe that under no circumstances he would consider that there would be nature in his neighborhood -- and then he shows great flexibility in applying his definition.

> Arjen: "What is nature to you?"
> Peter: "...Trees and plants and water and unpolluted places. People haven't been there. Places where there's no buildings or cars or pollution. And water you can drink out of a stream, and there's lots of wild animals. Like in Wyoming, there's lots of that."
> Arjen: "Could you find nature in this area?"
> Peter: "Yeah, a lot of varied...even on Colby property there's, straight up there near the busses, there's a couple of bushes, and may be there's a plant that hasn't been grown by a human or something."
> Arjen: ".....weeds?"
> Peter: "Weeds are nature, yes." (DMS_M_2).

This notion of nature being everywhere if you look closely, returns in both the suburban and the city interviews. Many of the suburban students seem to be able to articulate it better, but the Detroit students refer to it as well. The analysis of the interviews shows that although nature in itself is pure, peaceful, relatively untouched by humans, it is present on least two different scales: 1) a macro scale, big chunks of land with forests, ponds, creeks, lots of wild animals and so forth, to be found outside of urban areas, and, 2) a micro scale, small patches of land that can be found in urban areas often bordered by roads or fences, on which plants (including weeds) and trees grow and some animals can be found (parks, fields, and even yards). Looking at nature with this perspective resolves the apparent contradiction that on the one hand the students regard nature to be pure in the sense that humans have not tampered with it in any way, while on the other hand they all believe that there is nature to be found in their own neighborhood.

Arjen: "Do you think there's nature in your neighborhood?"
Bill: "Yes, I think so. In the field across the street there's grass and squirrels."(CMS_M_5).

Arjen: ".....Can you find nature in your neighborhood?"
Aisha: "I guess when you see the trees and all that and the grass and the flowers in the summer time. Yeah, and the snow and the animals that run around wild sometimes." ".....I don't particularly like the sound of birds chirping 'cause they wake me up in the morning. They build their nest right up above the window and they wake me up every morning early, chirping in my ear." (CMS_F_6).

It is interesting to note that some of the city students, when comparing being in nature (at the macro scale) with being in the city, make reference to the people who live in or near nature. They seem to extend the "peace and harmony" association with nature to the people as well:

Whitney: "I like the pretty colors of the flowers, the way the birds, you know, sit like, they were together and there was no trash around and the people cared, they really cared."(CMS_F_7).

Bill: "It smells better and the trees are nicer. They got their colors [more clear]. It's clean up there and the water is not polluted and the people get along a lot more than in the city. It's peaceful and quiet." (CMS_M_5).

Horace suggests that the people who live in or near pristine nature do not have to worry about such as drugs. They only have to worry about keeping nature clean.

Horace: "This looks like the place where we went if you go up the road, this look something like the lake. I think it's just a place where nature live. You could go some place and see a lot of trees and stuff and be able to hike and see what it's like to live in the wilderness. So I think this picture is not too bad. Things they have to do there is try to keep it clean 'cause I don't think drugs is a problem in a place like this." (CMS_M_3).

Carol, who earlier in the interview told me of her belief in God as the creator of the earth, seems to be rather confused about the whole concept of nature. At first she suggests that when humans and other animals come in the picture, nature ceases to exist, but as we continue our discussion she seems to change her position:

Arjen: "How would you describe nature?"
Carol: "It means a lot of things to me. Nature I think is not exactly people and animals. I think it's the earth itself like, I don't know if you could understand, but the way it was before people and animals lived on it." "Like, ... I think it's like trees, grass, plants, anything that was on [earth] before animals and people were here (.....)."
Arjen: "So animals are not part of nature?"
Carol: "They could be, I mean, yeah, nature, people and animals, but that's what I see as first and then you can add the animals and the people 'cause we're all part of nature so..."
Arjen: "Is there nature in Barnsley?"
Carol: "Yeah, I think there is in a lot of places. It's not just the parks, but you can have nature like in my garden and I have a lot of trees and plants."
Arjen: "But you put it there?"
Carol: "Yes, I did."
Arjen: "But is that still nature then?"
Carol: "In a way it is when I put it there. Somebody had to put the trees and the grass here." "So, I still see that as nature."(DMS_F_3).

Carol does not seem to believe in evolution or at least is not aware of evolution theory. This obviously has consequences for her outlook on the concept of nature for it prevents her from ascribing to nature characteristics such as; self-supporting, spontaneous and existing on its own independently from human activity. In her mind nature exists only because God or people gave birth to it. It should be noted that this outlook might have different consequences for her interaction with nature and her perception of nature as a threatened territory, depending on her beliefs.[8]

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[8] White maintains that there are different perceptions of nature within Christian religion. On the one extreme there is the view that since God created nature, nature must also reveal divine mentality. "In the early Church, and always in the Greek East, nature was conceived primarily as a symbolic system through which God speaks to men....." (White, 1967, p. 1206). Nature was perceived artistically rather than scientifically. On the other extreme is the view that emerged in the Latin West in the early 13th century when theology more and more became the decoding of the physical symbols of God's intentions by discovering how his creation operates. It can be argued, as White does in his landmark 1967 article, that this analytical mind set gave birth to the analytical sciences of today which no longer need hypotheses of God to justify their existence. The one extreme position considers nature to be holy and worthy of our protection, while the other extreme cybernetically considers nature to in existence for human's sake: all we need to do is analyze it and understand it so that we can take full advantage of it. White argues that since the roots of our trouble are largely religious, the solution must be essentially religious as well (as opposed to solely seeking for solutions in our present science and technology which, according to White, are tinctured with orthodox Christian arrogance toward nature). White looks for solutions in the Franciscan Order and nominates Saint Francis for patron saint of ecologists. "Saint Francis believed in the virtue of humility -- not merely for the individual but for man as a species. Francis tried to depose man

At least one of the students apparently has resolved her dissonance by speaking of human-made nature and real nature. Real nature seems to exist by itself independently from people, whereas human-made nature has been created by people.

Arjen: "Would you find nature in, say, Barnsley?"
Charlotte: "There's some of it but there's not a lot. I mean there's like, well, it's more like man-made nature than like real nature." "When I think of man-made nature I think of trees planted in a yard or whatever, but real nature would be, like, the closest real nature to where I live would be the river."(DMS_F_5).

According to Charlotte, human-made nature has its own species which have adapted to living with people. This becomes apparent when we talk about road kills:

Arjen: "Have you ever seen dead animals on the road side?"
Charlotte: "Yes, we see, like, a lot of opossums or, like, big crows. And I guess the worse kind we saw was a hawk on the side of Davis, and it was... I don't know... I understand that I crow gets hit 'cause a crow is more like a city bird, but I kind of felt bad for the hawk because it was so out of place with all the roads and stuff."(DMS_F_5).

To find a dead crow -- which Charlotte refers to as a city bird -- is less painful than to find a dead hawk. Even though both birds probably suffered equally, it apparently hurts Charlotte more to see a dead bird that is out of place in the city, than to see a dead crow that is commonly present. The hawk never got the chance to adapt to people and therefore didn't stand a chance to survive, but the crow should have known better, so her reasoning seems.

The students' notion of "real nature" which is pure, pristine, peaceful and not human-made, appears to expand upon their earlier descriptions of nature as being flowers, animals, trees and alive. Yet, there appears to be some idiosyncrasy among the students when it comes to attaching meaning to concepts such as: "pure," "untouched by humans," "the origin of nature," and "human-made" nature versus "real" nature. As I move on to the next

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from his monarchy over creation and set up a democracy of all God's creatures." (White, 1967, p. 1206) I should note that not all historians perceive St. Francis this way.

interpretation of nature students have come to perceive as a result of their experiences with nature -- be they physical, non-physical or a combination of the two -- this idiosyncrasy appears to increase.

4.5.3. Nature Is Freedom

When students would tell me that nature consists of animals, grass, flowers and trees, I would usually follow up with the question: "Would you call a zoo nature?" Their answers to these questions do not only reveal students' ethics regarding keeping animals in cages, but they also add another dimension essential to nature: freedom to move and to do whatever you want or need to do.

Arjen: "What does that mean to you: nature?"
Maurice: "...Animals, lots of grass and trees. Sort of like the jungle but common place."
Arjen: "Would you call a zoo nature?"
Maurice: "No, not really because they are enclosed, they don't have room to run around."(CMS_M_1).

Arjen: "What do you think is closer to nature: the forest with animals or the zoo with animals or is it the same?"
Alicia: "The forest because in the zoo animals are sort of kept, but in the forest they can go on free and wild and don't have to be [somewhere at] certain times when it get feed. They can go out and feed theirselves and stuff like that."(HMS_F_1).

Arjen: "Would you call [a zoo] nature?"
Scottie: "In a way I could, in a way I can't..." "Because in the zoo there might be flowers and stuff around... that could probably be called nature too...." He goes on to tell me that on the other hand it isn't nature because the animals are caged in. He adds that it is better that they are caged in otherwise the lions might turn loose and hurt people."(CMS_M_5).

Peter: "A zoo is not nature, they... it's an unnatural habitat for the animals. They're supposed to be in like the wild and everything, but they're not. It's not nature."(DMS_M_2).

The fact that animals need to be free in order to be part of nature brings up the issue of whether animals, such as squirrels, in their neighborhood, are free to go wherever they want to. Most students would argue that

neighborhood animals, unless they were pets, are free to go where they want to. When I asked them whether they had ever seen dead animals on the road side they would all acknowledge that indeed they had. This shed new light on the question of whether animals in the neighborhood are free to go where they want to, since the roads in a sense form the fences and the ditches that face animals in a zoo. The apparent contradiction offered some interesting insights in the reasoning of the students:

Arjen: "How about the zoo, what do you think, is that nature?"
Carol: "....To me it's not because most of that is taking away the animals from nature [to put them] in a public place and anybody can see them. So they were... they still are part of nature, but they are not in their... where they really belong, if you know what I mean" "They belong free and then they're in nature."
Arjen: "So when they can pretty much go anywhere they want then it's nature?"
Carol: "Yeah."
Arjen: "How about the raccoon or the squirrels in your yard; can they go pretty much where they want?"
Carol: "Yeah, they roam in the garbage cans [laughs] and pretty much where they want, but they are still like in a cage, you know, where the houses are kind of because we have garages where the doors close and they can't get in there, so it's still kind of like a cage for them, but they still can go wherever they want."
Arjen: "Okay, do you ever see dead animals on the road side?"
Carol: "Yeah, I do, a lot."
Arjen: "What do you think of that?"
Carol: "I don't like it at all....."
Arjen: "What kind of animals do you see?"
Carol: "....Squirrels mostly, I would say, and I have seen dogs before and like raccoons, I see."
Arjen: "So, but you would still say that they can pretty much go where they want?"
Carol: "That's, yeah, like their cages... They know they can go where they want, but then there's an end where they know [that it's dangerous] they have learned..." "..... It's dangerous to go out in the road or it's dangerous to get, like the ones that are free up north, a lot of them shoot'm, and they're not actually free wherever they want to go, but they are in their own little cage like the zoo, so..."
Arjen: "So there is still a difference between a zoo and that?"
Carol: "Well not..., I could say that there is a difference, but not much 'cause they are caged in but they are safe, and the animals on the outside are caged in and they are not always safe."(DMS_F_3).

Carol acknowledges that the animals in nature are in a way caged in as well, but there is a big difference with the animals in the zoo: the animals in nature have a choice to go to different places, but with that choice comes the risk of getting run over by a car or getting shot by a hunter. Animals in nature are not as safe as animals in the zoo. Carol seems to suggest that the

animals' freedom in nature is only relative and that being vulnerable is an essential part of nature.

Charlotte also confirms the notion that on the one hand animals in nature are free to go where they want, but on the other hand they do get killed on the roadside. When I ask her how she feels about that, she touches on the conflict that exists between the presence of animals and humans. Unlike Carol, she does not think that the animals have learned where not to go. She thinks it is animals' natural curiosity that will get them killed.

Charlotte: "Well, I think it's kind of hard to say...." "The squirrel that has gotten into an area with a lot of roads and stuff, I feel bad for him 'cause they don't really know that they can get killed on the road. But they .... are so curious, that it's kind of, I mean it's not really their fault, but it almost is 'cause they are so curious. What I mean is, it's not really their fault 'cause that's just the way they are, but I feel bad for'm."(DMS_F_5).

Rob sheds a different light on the concept of freedom by suggesting that it's all in the mind. He acknowledges that the squirrels in his neighborhood are sort of kept in units border by streets, but, unlike the animals in the zoo, they do not know this:

Rob: "In a sense squirrels are sort of held in units, but they don't know that, so they feel like they're free 'cause they can go anywhere until they see a street..." [In a zoo] they know that they can't go down in that big ditch into the bottom or else they can't get out and they can't get up to the other side to the people, and I think it would be real bad to be in a cage and to see all the people walking by with food and things and you'd have so much energy built up, you wouldn't know what to do with it...."(DMS_M_8).

The Detroit students seem to agree that freedom is an essential part of nature as well. Although some of them talk about how dangerous it would be to let the zoo animals roam freely, most acknowledge that, even though it can be fun to watch the animals, it is unnatural to be caged in. The first part of Alicia's excerpt shown below reflects how many of her peers feel about zoo animals, but the second part adds yet another aspect to the relationship between nature and freedom:

Arjen: "What do you think is closer to nature: the forest with animals or the zoo with animals or is it the same?"

Alicia: "The forest because in the zoo animals are sort of kept, but in the forest they can go on free and wild and don't have to be [somewhere at] certain times when it get feed. They can go out and feed theirselves and stuff like that." "But in South Africa it's killing the elephants for their ivory tusks, but I really think animals in Africa will be better off in a zoo because people will like to kill them. Thousands and thousands of elephants are killed every year for their ivory and I don't think that's right and different kinds of rhino's and stuff."(HMS_F_1).

Aware of the fate of many African rhinos and elephants, Alicia believes some animals are better off in the zoo than in nature. Poachers and hunters pose a constant threat to many wild animals and the price some animals pay for their freedom may be too high. Emotionally affected by this phenomenon, Alicia would rather see the animals safe in a cage in a zoo.

Nature as representing freedom, a place without boundaries, where animals can roam around freely, returns in many of the interviews, but what the students consider to be freedom is not uniform. There are different views on whether animals in urban areas are free. Some think they are since they have the choice to go anywhere they want to and they do not perceive busy roads as borders that limit their movement. Others think animals in the neighborhood *are* aware of the dangerous roads, but that their natural curiosity will kill them and that they are therefore not free. Then there is the value put on freedom. Some consider being free an essential and desirable part of being in nature, but others note that if animals are free, they will be exposed to the threats posed by nature itself in the form of predators and sometimes to the threats posed by humans in the form of hunters and poachers.

4.5.4. Nature is Solitude

When talking about *marco-nature*, many students mention the solitude and isolation that comes with it. There seems to be a lot more space and many places to get lost, and it can take forever until you find a house or other people. Some students see this as an intriguing and inviting aspect of nature, others, particularly the Detroit students, see it as a major drawback.

Horace: [On the disadvantages he sees in living in a nature area up north] "....'Cause they've not that many people and not that many places to go, but....say it's a house right there, you got to go all the way down to another part of this picture to see another house, and I think that's probably nice because you can't say that one person in your neighborhood won't clean up because if you living by yourself over here then it would be your responsibility. "....You can't see nobody. It's like 15 miles before you can see anybody."

Arjen: "Now, you were comparing the two: your neighborhood and that place.... what would you choose?"

Horace: "I'd probably choose here because it's [too] quiet out there... I'd like to get over to my friend's house 'cause I would get... I love outside, but once in a while you don't wanna be around... and there's really no place to go meet people. Like you got to go 50 miles up to go see somebody. And all that time you would be getting lonely and stuff. 'Cause not all the time, say my brother he might leave or whatever. There's a store right up the road and not too many people be there..." (CMS_M_3).

Horace displays some of the ambivalence students have towards being in large natural areas. First of all, it seems too quiet because the background noise that he is exposed to in the city is missing. Some of the students told me that they liked the sounds of the city: cars honking, church bells ringing, construction workers using machinery. Horace also points to the social and instrumental disadvantages of solitude in nature: you have to go far to see another house and meet other people, and convenience stores are far away. Several students think solitude in nature is fine as long as there are people, shops and entertainment facilities within reach.

Arjen: "Okay, so you like to be out there [a forest area up North]. Would you wanna live there?"

Tasmika: "No!"

Arjen: "Why not?"

Tasmika: "Too far to go shopping. You like be thirsty, you can't get water out of the faucet 'cause it's like rusty. So you have to go five miles down to a well to get some water."(CMS_F_2).

Tasmika illustrates the earlier concern some students have about not having a place to shop in the near vicinity, but adds to this a distrust of water in nature areas. Having had a bad experience with a water faucet that released "rusty water" she has come to discredit water that does not come from an urban faucet. I should note that there are several of her colleagues in the Detroit schools who do not trust that water either (see Chapter V). Whitney points to yet another drawback of solitude in nature:

Arjen: "Would you like to be in such a place [we are talking about the picture with two people hiking in a forest]?"
Whitney: "Maybe, but I'd rather be in my neighborhood?"
Arjen: "Just for a day or so?"
Whitney: "Maybe for 26 minutes..."
Arjen: "Would you be scared?"
Whitney: "If I'm alone, I would." "Because I am all alone and there's nobody in this place with me and I don't know anything about this place. It's not my kind of place. I don't know my way out, I don't know any way in, I don't know where I am going either." (CMS_F_7.

Whitney, expresses the fear expressed by many of the Detroit students of being in large natural areas, particularly areas with blocked visibility (See section 4.6.7. *Nature as a Threatening Place*). The fear of the unknown, of not knowing where to go in case of danger, not knowing the way out, not knowing where you are, and, as will become clear later, the threat of being assaulted, raped or murdered, make macro-nature a very undesirable place to be. This view is quite different from Roger's and Alice's who have been in forest areas and "undisturbed" countryside many times with their families:

Arjen: "What do you like about looking at the country side?"
Roger: "....I like it when it's undisturbed 'cause there you kind of just get so involved with the surroundings that you loose complete..., like it's very relaxing and I like that." (DMS_M_7).

Arjen: "When you go up North, how do things change?"
Alice: "Well, when we go up there on the high ways it's a lot less populated. To me it looks less populated 'cause all the trees... you can't see any signs of like humans. They are surrounded by trees. I think there's more nature. It just looks that way." (SDCD_F_5).

Roger and Alice, as well as many of the Barnsley and Forest Grove students, value solitude in nature. This is not to say that the above perspectives are not at all shared by some of the Detroit students. Nature is a place where you can get away from people, where you can be on your own without being disturbed. Roger puts it best when he says "...you kind of just get so involved with the surroundings that you loose complete..., like it's very relaxing and I like that."

Clearly the students recognize solitude to be a part of nature, but there appear to be sharp differences in the way this aspect of nature is valued. At the source of these differences, I gather, are a combination of personal

experiences or lack thereof, as well as the way nature is portrayed in the media and in horror movies.

4.5.5. Nature is Self-Supporting, Wild and Spontaneous

Both on the micro scale and on the macro scale, nature is self-supporting (see Bill), wild (see Alicia and Scottie) and spontaneous (see Tanya). These characteristics add to the mystery and mystique of nature.

Bill: "The air and how things grow and ... how the pollen is spread and all the bees and all the insects. They know how to be by themselves, like they work and they have (stuff) on their legs and they spread around the seeds." (CMS_M_5).

Arjen: "What do you think is closer to nature: the forest with animals or the zoo with animals or is it the same?"
Alicia: "The forest because in the zoo animals are sort of kept, but in the forest they can go on free and wild and don't have to be [somewhere at] certain times when [they get] fed. They can go out and feed theirselves and stuff like that."(HMS_F_1).

Arjen: "Does it make a difference whether they are in a cage or not?"
Scottie: "In some ways it does... 'cause animals, like say lions, they might turn loose and they might hurt people."(CMS_M_4).

The use of the word "wild" as in Alicia's excerpt, deserves attention here. The students seem to ascribe at least two distinct meanings to the word. Some talk about wild as in wild animals, such as bears, tigers and lions, who can hurt you. Others associate wild with uncontrolled, uninhibited nature, which includes plants and birds. In other words, species that do not pose any danger, but are still wild.

Arjen: "Do you have nature in your neighborhood or is that something you don't find in the city?"
Tanya: "In my neighborhood we find lots of nature. Flowers, flowers that you don't plant will grow and we have a tree that's in the next block that nobody planted: it just grew!"
Arjen: "Do you like that or is it like a weed?"
Tanya: "Well, it's a strange thing the way you don't plant something...no one else has planted it before and it just pops up!"(HMS_F_2).

Tanya perhaps gives the most convincing argument for the existence of nature in the city, even in the back alley. Things grow that nobody put there, they just pop up! Although Tanya articulates the essence of nature extremely well, she confirms what many other students seem to say as well, namely, that the definition of nature the students have is far more sophisticated and flexible than previously thought. Even the weeds we are all supposed to hate are part of nature, according to some of the students.

So far I have attempted to capture the different elements of students' definitions of nature. The students' definitions of nature are all verbalized statements based on their own experiences as well as the information they have received throughout their lives. Despite some striking differences in the way certain elements of nature are interpreted (i.e. their interpretations of *freedom, human-made* and *solitude)* there appears to be some family-relatedness in the students' definitions that transcend their different backgrounds. I should note that these definitions are not fixed in time, but are likely to change as a result of future interactions with nature, new information and personal reflections. The students' definitions and interpretations of nature are based upon the their verbal responses to questions of the "what is" and "how would you describe" kind. In the next section, I will try to capture their lived experiences with nature by asking them to describe past personal interactions in or with nature.

4.6. Experiencing Nature

Unlike the previous section, which focused on students' definitions and descriptions of nature, this section discusses nature as *experienced* by the students. The interviews provided a rich body of information that after analysis showed several types of nature that exist in the minds of the students. Most of these types exist simultaneously in the minds of all the students, but certain types are dominant depending a mixture of elements related to socio-economic and physical environment and to gender. I should note that the experiences described below are meaningful to groups of students varying in size, and not necessarily to all the students. Roughly all the experiences described here can be divided into two categories: experiences

in nature, and experiences *with* nature. What follows below are the eight types that emerged from the interviews.

4.6.1. Nature as the Center of Activities

Even though nature has many features, the one that is most important to some students is the variety of ways in which nature or elements of nature can be used for having fun. Nature is at the center of many activities students engage in. Many of the outdoor activities students enjoy depend on being in nature.

> I ask Carol what it is she likes about being up north in her family's vacation trailer:
>
> Carol: "... Well, I don't like a lot of fast moving, you know, just go to, you know, go some place, go to the next. I like to plan it out step by step, but it's just, you know, you can bring a friend up North, but you don't have to bring a whole lot to have fun because you can just find so many more things to do than you can do here. Like you can go on a butterfly hunt or you can look for owls, you can see the deer and we also have a bunny farm up at our trailer and it's just fun to see a lot more things than you can see here. 'Cause you'll see television probably for the rest of your life and you can always see cars and it's just a lot more special to be with the things that, like, they had a lot of generations ago. I think it's just kind of a lot more fun."(DMS_F_3).
>
> ---
>
> David: "I don't know about the smells, but I enjoy listening to the birds and stuff. I do that with my dad; go up north and just go up and listen."(SDCD_M_4).

Carol and David both refer to several activities that clearly depend on being in nature. Looking for deer and owls, going on a butterfly hunt and listening to birds depend to a large degree on being in nature. Exploring nature to many students is an enjoyable adventure of the Tom Saywer kind. The entertainment value of nature gives rise to the notion of being in tune with nature. Many nature-dependent activities depend on being comfortable with nature and being able to seek out things to do. A butterfly hunt and looking for deer and owl require some familiarity with the species and their habitats. Students who have had multiple nature experiences that are enriched by some guidance -- be it by an interested parent or an inspiring teacher on a field trip -- are likely to find interesting things to do in nature.

On the other hand, students who have had only incidental experiences with nature and who have not had any guidance are likely to have interactions with nature that are quite different (see some of the other meaningful experiences in nature). To be able to seek out meaningful interactions with nature, one needs to be to be able to perceive the vast amount of natural phenomena that occur in nature. Without being aware of how a beaver can cut down huge trees needed for his beaver dam and without knowing anything about the life of a beaver, it is difficult to recognize a tree that is being cut down by a beaver and to appreciate the work the small animal is capable of doing. The tree with the circular incision becomes just a dead tree, while the beaver dam becomes a logjam obstructing the flow of the river.

This is not to say that without this perceptiveness -- which can be learned -- one cannot enjoy nature. There are plenty of spectacular events that occur in nature that are intrinsically enjoyable that do not require knowledge of species or biotopes. A waterfall or a blood red sky after sunset are to many people esthetically pleasing and enjoyable. Nonetheless, for nature-centered activities it seems to be important that the students have some knowledge of and perceptiveness towards natural phenomena. Many of the suburban students have had a variety of nature experiences and have had opportunities to build a positive relationship with nature that includes nature-centered activities. This seems to be the case for only a few of the Detroit students who participated in the study.

Developmental psychologists have documented in great detail that children tend to be very creative in exploring their surroundings and can have meaningful interactions with their surroundings even when they seem meaningless to us (Kelly, 1963; Keeton and Tate, 1978). Margadant has documented that young children are very creative in their interactions with animals and nature (Margadant, 1988a; 1989). When looking at the adolescents who participated in this study, we should realize that their interaction with their surroundings has been transformed. In general, relationships with surroundings are of a more functional and/or instrumental nature. Interactions with nature are judged mainly by the

extent to which they are entertaining (including esthetically pleasing) or useful (including hunting, fishing and nature as provider of resources such as food). Some of the students' comments illustrate this well:

Peter makes reference to nature as a provider of food for survival:

Peter: "I have stayed at camp. We [had] to stay one week without any -- not one week, like three, four days -- food, but we did have a tent and sleeping bag and everything, but no food. We had to get our own and if you couldn't take it you had to walk back to the camp, but we (.....) had a book that would say what you could eat and not eat. These cactuses they were horrible, we had to pluck them and everything and we'd eat those, but you could get really sick of'm fast. It's not fun eating cactuses...."(DMS_M_2).

David makes reference to a nature centered activity that several of the students are engaged in: hunting.

David: "Well up north there's not many people around. We have a cottage and a cabin in the area, and the cabin we use when we go hunting. There's a lot more area around it." "I like hunting: partridge hunting with my dog or something. Go deer hunting. But deer hunting, that's really just sitting in a tree stand or sit in a blind." (SDCD_M_4).

As far as the entertainment value of nature is concerned, we should consider the fast-moving world the students live in. Things occur at a rapid pace, whether it's playing a Nintendo game, watching TV or being in school. Event after event takes place with relatively little time in between. This has important consequences for the role time plays in nature experience. To many students something is entertaining and fun only if it piques their curiosity and keeps on moving. This is true for many games they play, the movies and TV shows they watch and many of their holiday outings (e.g. a trip to Disney World or Cedar Point amusement park). Experiencing nature is not like this, particularly when one is not perceptive of all the things that occur in nature.

For nature to be a place that is interesting by itself requires perceptiveness, sensitivity and patience. Perhaps this is why nature shows on the Discovery Channel are valued so positively by many of the students. They increase the students' perceptiveness and sensitivity to nature, but they also condense nature to assure that things occur rapidly. The film-makers must be patient, sometimes spending more than a year in nature to make a one hour nature show. The people watching the show get a "best of" version

of nature. While this does raise awareness and sensitivity and piques the audience's curiosity, it also might create false expectations of nature when going on a fieldtrip in a nature preserve.

Many of the nature-centered activities that students are engaged in are organized activities. Many of the suburban students and a few of the city students have been to summer camp, often as Boy or Girl Scouts, or have been on a nature trail with school. Nonetheless, there are many suburban students who describe how they invented their own nature-oriented activities. Locally, they would go to a small forest or to the river and follow tracks, chase muskrats, build a fortress or a tree hut and look for young animals, to name a few of their self-initiated activities. Sometimes they did this with a parent, but often with a friend or friends.

Arjen: "Do you have, like, a secret place to go to in your neighborhood?"
Carrie: "Well, kind of secret. Up the street there is the Rouge river, I think it is, and there's a little bridge that goes over it and I like going there 'cause my dad used to take me there." "We used to throw sticks on the other side and then we'd come under the bridge and we'd look."(DMS_F_4).

Arjen: "Do you have like a secret place you go to in your neighborhood?"
Charlotte: "Well, when I'm by myself or just with a couple of friends, I like going back by the river, like under the bridge, there's a big (gravel) stone bridge we like to go under."(DMS_F_5).

Interestingly, the students who describe these activities talk about them in the past tense, suggesting that this something that they used to do. Many of the nature activities they used to be engaged in are now no longer interesting. Other things seem to have become more important in life (mostly school, friends and sports). The city students do not mention these types of activities. That may be partly because of the lack of nature areas locally that allow for these activities to take place and partially because of their fear of some of the natural areas that do exist locally (See Section 4.6.7. *Nature as a Threatening Place*).

4.6.2. Nature as a Decor for Activities

The students often associate nature with a place where you can have fun, a place where you can play games that are hard to play at home. Nature becomes the background of a large array of activities and is not at the center of these activities. These activities are most often recreational activities.

Many of the students like to go on vacations away from home to places that provide a mixture of nature experience, home entertainment (watching TV, renting a video, playing Nintendo) neighborhood entertainment (riding bikes, playing outdoor games and sports):

I ask Horace to whether he prefers being at home (which he really likes) or being at the cabin on a lake his family used to go to.

Horace: "...It would be hard to say 'cause both places I like, but the lake is real fun 'cause they got Nintendo, they got TV, they got a VCR, they got everything in that one cabin...."(CMS_M_3).

Rob illustrates that being up North in a nature area is not fulfilling enough in itself. Like many of the students who participated in this study, he balances nature centered activities with activities in which nature serves only as a decor.

Arjen: "Don't you miss the phone or TV or...?"
Rob: "No, not when you're up there."
Arjen: "Aren't you bored then? What do you do?"
Rob: "Well, I sometimes bring a radio up there or we rent a boat from the people we rent the cabin from, so we can go swimming and water skiing, and if you go out to about 10 or 11 feet deep and you swim down, it's real clear and you can see the clams or the oysters. They're like half way into the ground and you can see all their empty shells."(DMS_M_8).

Removed from the context of their everyday life, many of these activities become more fun. An ordinary bike ride becomes more interesting away from home. Even playing Nintendo seems to be different when renting a trailer or cabin up North. Nature provides a friendly atmosphere away from the worries many of the students have at home or at school in which ordinary activities become more enjoyable. For some of the city students who *do* occasionally get to leave the city, places far away from home represent relatively safe environments where they can leave their bikes unlocked, where people get along better and where drugs (and all the problems

associated with them) are not a problem. One should also keep in mind that when on vacation there is likely to be a lot less stress on family life. The fact that father or mother or both, do not have to work full days and the children don't have to go to school, combined with the peaceful surroundings, can make for a far more harmonious environment. For many students, vacations away from home represent one of the few occasions where they can have a meaningful interaction with one or both of the parents, whether it's going on a hike with mom, going fishing with an uncle or playing games with the family.

Arjen: "How is it different up north compared to here?"
Rob: "It's not as busy with roads and there's just, you know, around here they've a whole lot of stores where you can buy everything, but around there there's only one store and a couple of restaurants and there's no phone there so you don't have to worry about your parents or your sister being on the phone for the whole time so, like, you're all together and you can talk and play games."(DMS_M_8).

Many of the suburban students have social gatherings in secret places in nature. Under a bridge, in a tree hut or on a peninsula in the Rouge river, they will secretly meet. Nature provides intimacy and a shelter from adults. Nature here, again, serves as a decor. Margadant makes mention of the decor nature often plays in romantic encounters between students of the opposite sex (Margadant, 1990).

Charlotte: "There's an island my parents don't really like me to go on, but kind of built a bridge across it and my friend and I go there a lot."(DMS_F_5).

Arjen: "Alright that sounds good. Do you have like a secret place where you'd go to?"
Carol: "Yeah, there's like a little forest in the back of the park and I just like to sit in the -- it's kind of a tree that; it's a tree and we kind of built a fort -- so we sit there a lot."(DMS_F_3).

The city students who are part of this study also have their own secret places where they meet with friends, but these places are not places of nature. They are often at the local store, somebody's basement and sometimes a vacant house as long as it is safe. When asked about their favorite places their responses are quite different.

Arjen: "Alright, I see. Do you have any favorite places in your neighborhood?"
Tasmika: "Yeah, the store. 'Cause like the guy that own the store, he let us play the jukebox game free. Like if I run out of quarters, he'll let us play for free. He let us roller skate 'cause there's like a real big basement down there. He let us roller skate in there."(CMS_F_2).

Arjen: "Do you have like a favorite place in your neighborhood where you like to go?"
Latoyah: "Not really, most of us gather around each other's porches."(HMS_F_5).

Again even though the favorite places of the suburban students can be found in Detroit as well, albeit in smaller numbers, they are not considered safe places to hang out. The places the suburban students describe are in the eyes of the Detroit students only interesting when they are far away from the city. The only local activities that the Detroit students are engaged in that have nature as a decor would be touch football in the local park or a picnic on Belle Isle in the Detroit River.

Many of the students refer to nature or elements of nature as part of the decor of their neighborhood. Almost every one of the students in the study values the presence of trees. Nature beautifies the neighborhood. Apparently some of the associations students have with macro nature (for instance, peacefulness and quietness) are reflected by the elements of nature they find in their own neighborhood.

Arjen: "....Would you like to have trees in your neighborhood?"
Tanya: "Yes, 'cause that gives a certain amount of shade and it makes the neighborhood pretty especially in the Fall when the big leaves turn and being down on the ground. That's mainly why I would like trees."(HMS_F_2).

Arjen: "What does your neighborhood look like?"
Peter: "Medium size houses, big front yards, a lot of trees. It's sort of like a cathedral; a lot of trees filling the streets in summer."(DMS_M_2).

Nature to all students appears to be an occasional decor for a variety of activities. Away from home, and for some of the Forest Grove and Barnsley students, even near home, nature provides a special, friendly and relaxed background for playing games, gatherings with friends, and even for home and neighborhood entertainment activities away from home. For virtually all

the Detroit students in this study, the above holds true when far away from home, but not in or near their own neighborhoods. Local natural areas are often seen as a haven for crime and violence, and certainly not as a relaxing and friendly place to play games and hang out with friends. Yet, several of the Kedzie and Potham students recognize that elements of nature such as trees can beautify the neighborhood and provide for a friendlier, more pleasant atmosphere.

4.6.3. Nature as a Reflection of the Romantic Past

Some of the students, aware of the rapid pace of events to the extent it becomes stressful, appreciate that in nature things seem to occur at a much slower pace. They find nature peaceful, quiet and relaxing. Some even feel that in nature time stands still. If you want to see life as it was long ago then you can go to a nature preserve. In a very romantic sense these students talk about the past:

Carol: " 'Cause you'll see television probably for the rest of your life and you can always see cars and it's just a lot more special to be with the things that, like, they had a lot of generations ago. I think it's just kind of a lot more fun."(DMS_F_3).

Carrie also refers to the past by suggesting that in our time things are too developed to be able to return to nature. If everybody would go back to nature, she would be the first to join, but since that is not the case it would be awkward. She shares the negative view of development that other suburban students express as well (see chapter on environmental issues).

Carrie: "That's okay for a while. It's, you know, nothing like it. I have fun then." "I mean, I don't know how long that would be. If I was living in a tent here that would be awkward because of all the houses, but if everyone was [living like that] it might not be that bad because it wouldn't be so developed. But now we know what there is [what it can be like]. So you can't say; 'I don't want a micro-wave, I don't want a TV or something...."(DMS_F_4).

Peter goes even further by suggesting that the way we live now is unnatural. We have gone in the wrong direction in our development as a

species, away from nature. He wants to go back to nature when he's an adult and live in the wilderness somewhere in Canada.

Arjen: "Why, you know, you say you like wilderness and camping: why do you like that? I mean, when you're in the city you have stores and TV, a lot of people: why would you wanna go out to nature?"
Peter: "It's what we're supposed to be doing. We're not supposed to be living in a house with a fire and everything. We're supposed to be out there living on our own. Not making money and all that. Instinct. I guess I just like it and my dad liked it and my grandpa liked it. It runs in the family."
Arjen: "So you don't think this is natural here?"
Peter: "No. All the cars and all (....). People don't care (the world's being ruined by pollution anyway) so they keep on polluting and ....like the whale hunters. It's not very good."(DMS_M_2).

A few of the Forest Grove and Barnsley students refer to nature as a reflection of, what they see as, the purer and unblemished past. They seem to value some elements of the past and some even suggest that we have abandoned nature to the point where we are now destroying that of which we once were a part. Although only expressed by a few, the notion is quite meaningful from an environmental education point of view (see also Chapter V).

4.6.4. Nature as a Place for Learning

To a few students nature is intriguing and invites them to learn about the processes that take place and the species that are part of nature. Nature piques the curiosity of these students and in doing so inspires learning. Nature as a place for learning is at the core of many nature-conservation education and environmental education programs. Educators like to use the wonders and the beauty of nature to capture students' attention and inspire life-long learning about ecosystems and their elements. It depends on the program whether this learning is of a reductionist type (emphasis on analysis of single units and elements) or of a more holistic type (emphasis on ecosystems and on how units interact). Both suburban schools pay attention to nature education through their biology program. The private school is situated near the banks of the Rouge River and uses a forest area on school grounds for educational purposes. The suburban students in general seem to

be able to describe nature and natural phenomena with more detail in that they are able to name a variety of species and use words such as "habitat" and "ecosystem."

Carol tells me that her family has a nice garden and I ask her who decides what to grow there:

Carol: "Well, I am the one... I get to decide if I would like a garden. So that kind of improves my understanding of plants and animals..."
Arjen: "Oh...what do you like about it?"
Carol: "....It's kind of interesting to learn about photosynthesis and how plants grow and why they grow and about how the animals, you know, adapt to their environment. And the foods they eat. And I just kind of am interested in plants and animals."(DMS_F_3).

Horace talks about the picture of the forest area with two people hiking:

Arjen: "What do you think the people are doing there?"
Horace: "...Probably getting ready to set up a camp or... study trees or looking for birds."
Arjen: "Would you like to do stuff like that?"
Horace: "Yeah, I think it would be fun. I think it would be educational to go somewhere (.....) learning a lot of stuff like different kinds of trees and animals that live here...."(CMS_M_3).

Sometimes this learning about nature is part of a school activity or an activity organized by a group students join such as the Boy or Girl Scouts.

Arjen: "Alright, do you ever go on like a nature walk?"
Roger: "Yeah, I'm in boy scouts and we do that there a lot."
Arjen: "Oh, what do you do there?"
Roger: "We like learn to identify different trees. We learn to appreciate the surroundings and what they can do for you, and how to keep them going, stuff like that." DMS_M_7).

Nature as a place to learn is only mentioned by a few students. Most students emphasize other qualities of nature in describing their experiences. Many schools take their students on "nature trails" that have been designed to enable people to learn about nature. Often these trails make nature into an outdoor laboratory of activities. Students tend to value these walks, not so much because they get to learn about nature, but because they get to go outside into a less formal environment with an increased possibility to have fun. Much like going on a field trip, learning becomes secondary to many of the students. Some students dread nature as a place to learn when the experience is forced upon them, and would much rather explore nature on

their own. Sandra seems to be embarrassed by the fact that she does not like nature walks. She apparently thinks that people are supposed to like nature walks nature trails and that she is somehow deviant.

Arjen: "Do you ever go on nature walks?"
Sandra: (whispers) "Nature walks... sometimes. I don't like that very much." [seems a bit embarrassed]
Arjen: "It's ok, I can understand that."
Sandra: "My friends and I , 'cause my family doesn't go on walks very often, but my friends and I, we go into the woods and we'll play hide and seek and everything in the woods... and that's like a walk."
Arjen: "Yeah, but you're not there to study nature or..."
[
Sandra: "No, I am not there for school." (SDCD_F_2).

"I am not there for school," points at something to consider in setting up nature trails for educational purposes. If nature trails are part of an environmental education program, then perhaps they should allow students to experience nature idiosyncratically so that they forget that they are there to learn something.

4.6.5. Nature as a Place to Think or Reflect

Several students experience nature as a place where you can be alone and think by yourself. Nature to them is relaxing, peaceful and quiet. It inspires them to reflect on life in general or on specific things that challenge them. Away from the everyday distraction students can think freely about their emotions.

Aisha: "It's peaceful and you can think to yourself [reflect] and there might be animals and the sound of birds chirping."(CMS_F_6).

I ask Latoyah whether she would like to go for a walk on her own in a place like the one captured by the picture of a forest preserve:
Latoyah: "Maybe, if I wanted to think about something or be alone."(HMS_F_5).

Anna: "You just forget everything, it doesn't matter." "At home you're always worried."(SDCD_F_6).

Nature is a place where you are not bothered by other people and can relax. As Roger put it: "...it's undisturbed.... you get so involved with the surroundings that you loose complete [sight of your worries], it's very relaxing and I like that." Nature is a "nothing to worry about kind of place." (Peter, DMS_M_2). The peacefulness, the slow pace, the sounds of birds, the sun shining through the leaves, are some of the elements of nature that are soothing and inspire reflective thought.

4.6.6. Nature as a Challenging Place

Many students talk about the challenges nature offers. There are animals they have never seen before that could potentially be dangerous. There are animals they do know which they would rather not be around. There are sounds of nature that are used in horror movies which scare some of the students. The quotes below clearly show that nature can be challenging and dangerous. The danger here is either a result of the students' fantasy or fear of the unknown and of their image of certain animals. This type of nature, challenging nature, emerged in earlier Dutch studies (i.e. Viëtor, 1985; Huitzing, 1989; Margadant, 1990) under the name "uitdagende natuur." Let us first look at some of the challenging aspects of nature as seen by the suburban students.

Carrie regrets that her parents do not take her on camping trips any more. She clearly enjoyed living a primitive life once in a while, being all by herself without the modern conveniences. She finds it challenging and likes "just being stranded there."

> We talk about what it is like up north in Michigan. She tells me they have a boat on a lake they often go out with and that she likes places with "lots of trees, big forests, and not too much city around." I ask her whether she ever goes camping:
>
> Carrie: "Yeah, lots of times. I used to go with my parents and they got a bunch of friends and then we had tents and pit stoves and everything. And then, sometimes, they have gone camping with just nothing, just a little tent in the middle of nowhere." "I like it, I think it's challenging, but we don't do that anymore. My mom, I don't know, she just doesn't like nature so much. We don't do it that much, but I wish we could 'cause I like it: just being kind of stranded there."(DMS_F_4).

Peter points out that you can have challenging nature experiences near home. The Rouge River is not far from his house and he used to go there to play with friends. His account of his experiences is telling in more than one way, for it includes first-hand experiences with pollution, his initial fear for rats and sacrificing a fish to catch a rat, but also how nature can be challenging.

Peter: "Oh, I lived one block away from [the Rouge River] a while ago and I had always go down there and fish. And, I mean the fish were all... the water was so polluted that the fish would have like growths on their back and everything. It's really sad. And there're tons and thousands of rats pouring out there. Once it gets dusk, millions of rats would come out. Scary. But I have two pet rats so I am not as afraid anymore."

Arjen: "But you used to be afraid of'm?"

Peter: "I used to be. (.....) there was big rats they looked like they were two or three pounds." "There's holes in the ground and they eat like fish or a dead animal or something. They go in the water and swim and when there's (.....) they go under water and pop up there heads and go on, way on the other side." But they'd cross the entire river under water. And then they've got muskrats, they are <u>really</u> big, I mean we'd hunt rats and muskrats." "With (sling) shots, we we'd never get them or anything, you can't really kill a rat with a (sling) shot, but.... We'd fish and get a fish and put it up in the tree and all the rats would be climbing the tree, (at night) they'd all try to climb the tree."(DMS_M_2).

The rat hunting was a challenging game for Peter even though he realized that they would probably never catch a rat. The challenge was more likely in overcoming the fear of "tons and thousands of rats pouring out there" and not giving in to that fear with friends around. The rat hunt and the creative use of dead fish also illustrates how children make nature into a playground in which they can live out their own fantasies. Peter also is aware of another challenging aspect of nature: nature as a powerful, unpredictable and potentially destructive force.[9] This aspect of nature comes through when I ask him to describe the local river:

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[9] Huitzing refers to this type of nature as *weerbarstige natuur* or *unruly* nature. Nature is regarded as a ruthless counter force that is able to overpower human forces (Huitzing, 1990). Think of earthquakes, typhoons, hurricanes and floods. A few students mention this type of nature, but it does not seem to dominate their perception of nature. Julian mentions it because he experienced flooding of the Rouge River first hand. Students who have been caught in a severe thunderstorm or tornado might have a sense of "Unruly Nature" as well.

Peter: "Mud, mud. It's just like a foot of mud and then rocks and then it goes up, straight up two feet high and then there's another bank that's like twelve feet high, it's on the side. When the river floods -- last year we got like five feet of water in our basement and the entire parking lot was the river, and it was just, if you were in it you'd be dead 'cause (....) the bridge where the water goes under, there's was no air or anything under. It was even higher than the bridge. So you'd drown if you were under the bridge. So they had put a net there and they had tracks and everything, trying to sand bag it. I was helping sand bagging."(DMS_M_2).

Peter overcame his initial fear for rats by having them as pets. With affection and humor he talks about his two rats:

Arjen: "Do your parents like the rats?"
Peter: "My mom loves them rats. They're very nice, they come when they're called, they are affectionate and they like to eat. My rats are very fat. My rat's name is *Marilyn Monrodent* 'cause she's blond like Marilyn Monroe and she lays on her back. It's really funny." [emphasis mine] (DMS_M_2).

The mystery, drama, the unknown and the adventure are all part of nature as a challenging place. There is a great variation in the kinds of challenges nature provides for students: finding the trail-head, climbing a tree, breaking a dead branch, jumping a creek without getting wet, overcoming fear for a certain animal and tracking a deer, are just a few examples. I should acknowledge that what once used to be challenging, can over time and/or with increased experience become boring or at least less interesting. Other things become more interesting in life. Some of the suburban students make reference to this.

Bryan: "Well, the forest here is a little bit bigger, but when I was younger I liked the forest better, I liked that forest a lot."
Arjen: "You used to like going to the forest better that you do now?"
Bryan: "Yeah."
Arjen: "What do you think changed in you?"
Bryan: "Yeah, well, I used to go down there and explore, really just, you know, look for tracks and stuff. Me and my friend, we used to go down there a lot, but, I don't know, I just kind of lost interest I guess." (SDCD_M_8).

Bearing in mind that all the suburban students frequently have been exposed to nature and have experienced nature in multiple ways varying from extensive camping trips, frequent visits to a cabin in northern Michigan, trips to national parks, to local nature explorations by themselves or in more

organized fashion with school or parents, it should be no surprise that to many nature has challenging aspects while to some it becomes an almost routine, all too familiar experience. When considering the lives of the Detroit students, in which outings to nature preserves, camping trips, and even trips to local parks are rare, we can understand that their interaction and experiences with nature are likely to be different. The suburban students who frequently visit nature preserves locally and regionally tend to emphasize the *challenging* aspects of nature whereas the Detroit students put more emphasis on the dangerous aspects of nature. What is challenging to some is frightening to others.

Aisha and Gary express their fear for wild animals that "will hurt you if they get a chance." These fears surface in many of the interviews with the Detroit students. Since none of the students seem to have had a bad experience with animals in nature, these fears must be based upon hearsay, movies and documentaries and the students' own fantasies. The students point out that in nature it is easy to get lost and hard to hide from danger, e.g. there are no houses to escape to.

Arjen: "Is [nature] different from a zoo you think?"
Aisha: "Yeah, because in the zoo they have animals locked up and they basically can't get out to harm you, but in a wood where they are wild animals, they will hurt you if they get a chance." "The forest..... is nice to play in but I always get lost in the forest 'cause I went hiking a couple of times. I always get lost. And it's scary out there 'cause you never know who's going to jump out at you. That's why I have to get away 'cause all kinds of things can hide behind the trees and people can.. I just don't feel safe in a lot of woods. That's why I don't go through woods and stuff in Detroit." (CMS_F_6).

Gary: "It would look like it. It would probably have more wild animals, some bears or something." "You can't run and hide in this place or you can run to a ranger station." "Without wild animals it would be pretty fun [and safe]." [He tells me that there once was a loose panther in Michigan who hung out in Kensington park, making it very dangerous, but they later caught him.] (HMS_M_6).

Arjen: "Have you ever been to a real forest?"
Whitney: "I don't know if it was a real forest. It's not a real forest I think 'cause it was like a part of a park. In the woods there I saw all those little (ugly) animals. I couldn't take it."
Arjen: "No? Are you scared of animals?"

Whitney: "I'm not scared of animals. It's just that there were strange looking ones I'd never seen before. (Once I went canoeing) with my mother and father and my little cousin 'cause I went on a field trip to Belle Isle. We went to Belle Isle one time sitting and staring at the fish and the animals and wild life and (rocks) and stuff like that and we went canoeing, and I was real scared and I thought the water was real deep and if you looked to your left there was like a hole with something going in and something coming out and my mama started paddling faster and and my daddy, he didn't know [what was going on], he was scared, they were both scared. The canoe tipped over and it was funny 'cause I thought I was gonna drown but I was taller than the water so I had my cousin on my side and I had caught her and when I stepped over I felt something move on my foot and I stepped out of the water real fast....." (CMS_F_7).

The above excerpts point at the fantasies students have around the concept of nature. These fantasies are fueled partly by the movies they watch, the mass media and the incidental nature experiences they have had. Langeheine and Lehman point out that special, incidental and/or rare experiences have far more impact on perception and experience than do frequent and therefore less special experiences (Langeheine and Lehman, 1986). In the context of this study this would imply that children who are frequently exposed to nature, be it by its presence as a decor in their own neighborhood or by biweekly trips to their vacation homes in northern Michigan, are more familiar with nature and its elements and are inclined to take it for granted. For the Detroit students, nature is not overtly present in their lives, therefore they have to seek out those elements of nature that are present in their neighborhood, the few nature experiences they have -- including those derived from watching television -- will have a lasting impression, and deprivation from other experiences with nature would fuel their fantasies of nature. The students who visit nature frequently are more familiar with it and seem comfortable enough to seek out challenges.

Tasmika and I talk about nearby Kensington Park which she considers to be nature. She tells me that under no circumstances would she go there at night. I ask whether she would go there during the daytime:

Tasmika: "If you're with a lot of people on a field trip or something. If you're by yourself I wouldn't feel safe 'cause the animals can come at you or people could be hiding in the forest or something and come after you." (CMS_F_2).

Tasmika mentions people in nature posing a threat to safety. Most of the Detroit students, but virtually all of the girls, associate nature with dangerous people hiding behind trees. In the suburban interviews this issue does not emerge even once (although I would imagine that rape in outdoor areas would be a concern of the female students in Barnsley and Forest Grove as well). This led to the formation of another type of nature: *threatening nature*. This type of nature is different from *challenging nature* in that the challenges are not part of nature itself, but posed by the frightening people who are in nature. Additionally, a *challenge* is something to overcome and in a way makes nature an exiting place to be, but a *threat* is frightening and could keep people from going to nature in the first place.

4.6.7. Nature as a Threatening Place

Aisha has watched horror movies on TV in which horrible things happen. Often times unspeakable acts occur in dark forest areas with frightening animal sounds -- think of a howling wolf -- and the sound of the wind blowing through the trees.

Aisha: "…..The sounds of nature, they make them in the movies, and most of the scary things we see [happening] in the woods, like Jason with the people lurking behind the woods….. The woods just scare me."(CMS_F_6).

Students who incidentally visit nature and whose perceptions of nature are based upon a combination of their own fantasies and the unspeakable acts that occur in local parks (often well documented by the media), tend to seek out the familiar things that can be found in or near nature: clearly marked trails, a ranger station, a store, picnic tables and open spaces that allow them to see farther.

The following excerpts clearly illustrate the Detroit students' notion of nature as a threatening place: a place where dangerous people hang out, a place where girls get raped and people get murdered.

Aisha: "The forest... This is nice to play in but I always get lost in the forest 'cause I went hiking a couple of times. I always get lost. And it's scary out there 'cause you never know who's going to jump out at you. That's why I have to get away 'cause all kinds of things can hide behind the trees and people can.. I just don't feel safe in a lot of woods. That's why I don't go through woods and stuff in Detroit."
Arjen: "So where do you feel safer do you think: in a place like that or in your own neighborhood?"
Aisha: "In my own neighborhood."(CMS_F_6).

Arjen: "Can you find nature in your neighborhood?"
Maurice: "Yeah, at Belle Isle or [a park]."
Arjen: "Have you ever been there?"
Maurice: "Yes."
Arjen: "Would you call those places safer than your neighborhood?"
Maurice: "No, not really 'cause the people that hang out on my block is the people that hang out there."
Arjen: "And the people who hang out there can be dangerous?"
Maurice: "Yes."
Arjen: "Do they hang out there to take a hike in the park?"
Maurice: "No, just to show off their cars and stuff."(CMS_M_1).

Aisha feels safer in her own neighborhood than in a forest. This is understandable given her fear of the unknown and some of the negative associations she has with being in a forest, along with the positive associations of being able to play and hike in a forest. Bearing in mind the descriptions of the neighborhood many of the Detroit students live in, Aisha included (see Chapter III), one would be inclined to think that nature areas, at least those away from the city, would be relatively safe havens for the students. Maurice suggests that the guys who hang out on the street corner in his neighborhood are the same guys who hang out on Belle Isle.[10] Alicia confirms Maurice's impression when we talk about Bell Isle:

Arjen: "So Bell Isle, you wouldn't trust?"
Alicia: "No! Not never."
Arjen: "What's happening on Belle Isle?"
Alicia: "Okay, this past summer. When you go out there; sometimes my mother likes to go out there at night and just ride around and come back home, but there will be a lot of drunks, a lot of girls and boys playing loud music. Have you ever heard of rap?

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[10] Belle Isle is a local park on an island in the Detroit River. Many citizens go their in the summer to have picnics, play games, swim and hike. Virtually all the Detroit students who participated in the study have been to Belle Isle. It is one of the few natural areas in the city of Detroit that is used by many people.

Arjen: "Yes."
Alicia: "They be playing rap and drinking and getting high and drugs (exchanges) in the summer time and getting in accidents and stuff like that."(HMS_F_1).

Locally, the people who hang out in the parks cannot be trusted it seems. They can be dealing drugs, have weapons, be intoxicated and are libel to cause accidents. The students seem to be convinced that they are the same people who terrorize the neighborhood. However, in their neighborhood the students have a place to escape to, whereas in a park or in a forest preserve they do not. How do they feel about natural areas far away from home, removed from the negative influence of the city? Even natural areas far removed from the city are not safe in the eyes of many of the Detroit students:

Alicia talks about the picture of the forest with two hikers seemingly enjoying themselves. She tells me how beautiful the picture is before I prompt her about safety.
Alicia: "It's all the trees and little animals running around and the leaves. It's fresh clean water in some parts of forest little streams."
Arjen: "Do you feel safe in those areas?"
Alicia: "Depending on what state they are in or what country like if you go out at night at 12 'O clock at night to the forest I wouldn't go by yourself there ain't no way of you surviving because there are killers out there, but if you go somewhere like, say, Canada out in the forest you don't feel..."
Arjen: "...you have to worry."
Alicia: "But there are killers everywhere in this world."(HMS_F_1).

The excerpt speaks for itself: "...there ain't no way of you surviving because there are killers out there" and "... there are killers everywhere in this world." Apparently some states are safer than others and Canada is safer too, but even in those areas there are killers, and don't even think about going there at night. Alicia makes painfully clear that her personal experiences in growing up in a poor Detroit neighborhood, infested with crime, violence and death, colors her outlook of the world around her. Sure, most thirteen-year-old girls -- and boys for that matter -- regardless of the neighborhood and living conditions they grow up in, would rather not go to a forest alone at night. What is so powerful in Alicia's statement is that there is no doubt in her mind that you cannot survive on your own: you will get killed, there are killers everywhere in this world, even in Antarctica . . .

While taking about the picture of the forest area with the two hikers, Tanya expresses her ambivalent feelings she has for nature.

Tanya: "This looks like it's a suburb kind of because there's a lot more greener grass than there is in the city."
Arjen: "Okay, so it wouldn't be in the city?"
Tanya: "No, this would be a nice spot for someone to go camping. It's nice, quiet, a lot of shade if you just want to go for a walk in the summer and get out of the hot sun. This would be a nice place to go. On the other hand these trees keep people from seeing what goes on because the murderers and the rapists use the trees to block what they're doing. And if someone sees them that would cut back [the raping and murdering], but on the most side it's very nice."
Arjen: "Okay, so would you go there for a walk?"
Tanya: Not alone, but yes."
Arjen: With other people, during the day?"
Tanya: "Aha, not at night."(HMS_F_2).

Tanya prefers forests with just enough trees to give you shade, but not enough for murderers and rapist to be able to hide behind them. Cutting down trees would make the forest safer since it would expose the people who are there with bad intentions. This is not an uncommon feeling among the Detroit students in this study, it emerges in many of the interviews.

4.6.8. Nature as a Threatened Place

While the Detroit students who were interviewed frequently talk about nature as a threatening place, some of the Forest Grove and Barnsley students talk about nature as a threatened place. For various reasons the suburban students expressed their concern for the vanishing of natural areas. Several of the the students at Royal Oak school live (or at one point lived) on the border between urban areas and the countryside. As the suburbs expand outwards into wetland and forest area, the conflict between nature and human activity becomes immediately visible. The suburban students who live in new developments talk about this phenomenon:

Arjen: "How would you describe your neighborhood to a stranger like me?"
Paul: "Well it has forests around it and I live on a lake. So there's people that are starting to cut down the forest and put shopping centers there. So they are starting to ruin it."
Arjen: "Why do you say they are ruining it? Don't you like shopping malls?"

Paul: "I like'm, but because all the animals around there they don't have anywhere to go." "...The people are just knocking down all the woods. And they just - I don't know what they do with all the wood, but it just scares all the animals away."(SDCD_M_3).

Students who live in older neighborhoods also express their concern about nature being threatened. This concern varies from road kills of animals to the disappearance of trees.

Arjen: "Are there any things you dislike in your neighborhood? Things that you'd like to see change?"
Carol: "...I don't like to see that, you know, there's problems like trees, you know, they've diseases. I don't want to see all those trees gone, wiped out from the face of the earth. I would like to still have a lot of trees 'cause those trees are slowly going away..."(DMS_F_3).

Peter: "Oh, I lived one block away from [the Rouge river] a while ago and I had always gone down there and fish. And, I mean the fish were all... the water was so polluted that the fish would have like growths on their back and everything. It's really sad." (DMS_M_2).

The fact that some of the Forest Grove and Barnsley students tend to express a concern for nature as a threatened commodity should not lead one to think that the other students, including the Detroit students are not concerned about environmental issues in general. As will become clear in the chapter on students' perceptions of environmental issues, all the students who participated in this study in one degree or another express serious concerns about the quality of the environment. All the students have experienced pollution in one form or another. Many of them see nature as a filter of pollution and trees primarily as the producer of oxygen.[11] Most of the students, regardless of their backgrounds, express concern about the presence

[11] The students' notion of trees as producers of oxygen and the self-cleaning capacity of nature suggests that there may be a trend towards a perception of nature as a threatened commodity that is instrumental for our well being. The cutting down of trees, particularly the rain forests, is equated by many of the students to the depletion of oxygen and the greenhouse effect. Although students also equate trees and forests with beauty, shade and colors, it would be interesting to find out to what degree the perception of trees and forests as part of the environmental crisis dominates the students experiences of nature existentially. I doubt that even as recently as ten years ago similar interviews with 12-14 year-olds would have yielded similar perceptions of trees and forests. Possibly some students would have mentioned trees and plants as producers of oxygen as a characteristic of green plants, but not in view of the environmental crisis.

of litter and trash, particularly in natural areas such as forests and parks. Although all students are anthropocentrically concerned about pollution and other environmental issues, there are some students who express concern about the vanishing of nature areas as a result of human interventions. These students seem to say that nature and the species that inhabit nature have a right to exist on their own.

4.7. Summary and Conclusion

The analysis of the interviews provides us with the different meanings students ascribe to the concept of nature. These meanings have been formed as a result of their own interactions with nature, information they receive from the media -- particularly television -- and their education --mostly biology classes. The idiosyncrasy of students' interactions with nature, make for a rich picture of their perceptions and experiences, which reveals that they ascribe to nature a number of dimensions and qualities. Depending on the context of the experience, previous experience and personal mood, the students seem to emphasize different types of nature experiences at different times. Although not all the types of nature experiences that emerged from the interviews are shared by all the students, it is clear that multiple types exist simultaneously.[12]

Even though a variety of different nature experiences and perceptions emerge in all the interviews, there are some differences among students that

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[12] Some of the findings here are reflected in the work of, the University of Michigan based, Stephen and Rachel Kaplan and several of their former graduate students that focuses on the experiences of nature. They use a cognitive psychology perspective that incorporates the idea of the brain as an information-processing unit (albeit a perspective that is different from that of the brain as a computer) and that much of human functioning is impacted by its evolutionary origins. Their work on nature experiences makes used of their Category-Identification Methodology (CIM) which asks participants in a study to rank-order photographs of nature settings (including those in built environments) according to their own preference on a Likert scale. The resulting groups of photos or preference judgments then point at some commonalities or categories which can be interpreted and named by the researchers and subsequently be put in a theoretical framework. Using this approach they have done research on nature preferences of, for instance, African-Americans in urban settings (i.e. Talbot and Kaplan, 1984 and Kaplan and Talbot, 1988) and city children and environmental educators (Medina, 1983). For a synthesis of the research on experiences of nature conducted by the Kaplans and their colleagues, I refer to Kaplan and Kaplan, 1989.

are striking. Undoubtedly the Forest Grove and Barnsley students have had more experiences both in nature and with nature compared to the Detroit students. Most of them have been on several trips to northern forest areas and have visited national park-type settings across the country. Furthermore, they have had the chance to experience nature locally, thanks to the presence of the Rouge River and a variety of woody areas in their own neighborhood. It is not the physical surroundings of the city as much as it is the social environment, that prevents the students from having meaningful nature experiences locally. The Detroit students who participated in this study were unanimous in pointing out that there is nature in Detroit but often in places one should avoid. Concerns for their own safety keeps them from riding there bike to the Rouge River or the local Kensington Park. Lack of safety keeps many Detroit students from exploring local nature areas and prevents them from building a relationship with nature in which they feel comfortable enough to explore nature even when it is far away from the city. The few experiences they do have in nature areas are very special to them and have great impact on their perceptions of nature. Langeheine and Lehman's finding that special, incidental experiences have far more impact on perception than frequent, more common experiences, is confirmed here (Langeheine and Lehman, 1986).

As a result, the Detroit students also ascribe several dimensions to nature and attribute the same qualities to nature as the suburban students do, but value them differently (see Table 4.2.). When looking at the array of different types of nature experiences that are meaningful to the students (Table 4.1.), it should be noted that the Detroit, Forest Grove and Barnsley students have all but one in common. The only type of nature experience that does not surface in the suburban interviews is *nature as a threatening place.* The few Detroit students who have had experiences in nature far away emphasize nature as a threatening place when talking about local areas, while emphasizing the other, more positive, types of experiences when talking about nature far removed from the city. The Detroit students who have not had this kind of exposure to nature away from the city talk about nature as a threatening place regardless of whether it is local or not.

Table 4.1. Aspects of Nature Experiences Identified by Detroit, Forest Grove and Barnsley seventh grade students.

NATURE AS A CENTER OF ACTIVITIES Nature and/or elements of nature pique students' interest and curiosity, giving rise to a variety of enjoyable activities that are dependent on being in nature. Examples: butterfly hunt, listening to birds, looking for deer, following animal tracks, building a tree hut, hunting and fishing.	**NATURE AS A DECOR FOR ACTIVITIES** Nature is the background of activities that do not require being in nature, but are more enjoyable in a nature setting Examples: bike riding, swimming, attending a summer camp, meeting friends at a secret place in nature (social outlet). Elements of nature (e.g. a cathedral of trees in the street) can also make for a friendly decor for activities in urban settings .
NATURE AS A CHALLENGING PLACE Nature provides many challenges that touch the essence of human existence including overcoming fear and surviving without the conveniences of the modern world. Examples: wild water canoe trip, survival dropping in the wilderness, finding your way back to the trailhead, camping, hunting, chasing or avoiding scary or dangerous animals.	**NATURE AS A THREATENING PLACE** Nature is a dangerous place where you easily get lost and where people who want to harm (rape or kill) you, hide behind trees. Nature itself can be scary because the dangerous animals that wonder around, but the real danger comes from the people who are there and the fact that there is no place to escape to.
NATURE AS A REFLECTION OF THE ROMANTIC PAST Nature is a place where time stands still and things are the way they used to be when humans lived in harmony with nature.	**NATURE AS A PLACE TO THINK OR REFLECT** Nature is a peaceful and quiet place where you can be alone and reflect undisturbed by the distractions of everyday life.
NATURE AS A THREATENED PLACE Nature is a threatened commodity that is a victim of our modern society which is continuously expanding at the expense of natural areas. Examples: development of wetlands and forest areas in southeast Michigan, forest fires, neighborhood trees being cut because of diseases.	**NATURE AS A PLACE FOR LEARNING** Nature is intriguing and invites students to learn about the processes that take place and the species that can be found. Examples: identifying species, learning about the food chain, learning about plant growth and photosynthesis, identifying berries you can eat.

All seven experiences of nature provide some insight in what students value and do not value in a nature experience. With these insights I will attempt to sketch some roles nature experiences might play in (environmental) education programs in the final chapter on the implications of this study for environmental education in urban settings.

Table 4.2. Valuing Elements of Nature by Detroit, Forest Grove and Barnsley seventh grade students.

POSITIVE	NEGATIVE
Quiet Peaceful Birds chirping Pretty flowers Smells good Open space No trash Place to play and to do things: - picnics - camping - canoeing - hunting - Clean: - easy to keep clean - makes you feel clean - cleans the air - unpolluted water and air - no trash - no chemicals Clearer and brighter colors Safe - nobody will steal things from you - no drugs Animals (when they can't hurt you) Trees - provide shade - clean the air	Too far from shopping No houses near by No trails Leafy/messy Drinking water cannot be trusted (rusty) Unsafe and scary: - easy to get lost - dangerous animals can get you - killers can be hiding behind trees - you might get raped - scary sounds also used in horror movies. - fear of the unknown - no way of surviving when you're on your own. Too quiet Loneliness Boring after a while People who live there are old and retired and are no fun to be around. Bugs Trees prevent you from seeing far. Birds chirping in your ear in the morning.

CHAPTER V

YOUNG ADOLESCENTS' PERCEPTIONS OF ENVIRONMENTAL ISSUES

5.1. Introduction

Arjen: *"What are the major problems you see in the world today?"*
Peter: *"...Pollution, I am really scared about pollution and nuclear fallout. I am not really worried about war, like with guns and everything, as much as, like, nuclear war. I mean, nuclear war would be horrible 'cause it doesn't just kill the people, it kills their dogs, their cats, the old lady that's going to the market or something. The unsuspecting people; people that didn't do anything wrong."(Peter a 13-year-old student from Colby middle school, DMS_M_2).*

Environmental issues are once again high on the political agenda in many Western countries. Discussions about global environmental problems can be found in the media everyday and continue to shape public opinion and knowledge about environmental issues (Ostman and Parker, 1987). Rock stars, actresses and other public figures have attached themselves to environmental causes to raise awareness and funds. Politicians, legislators and members of the corporate world almost frantically jump on the environmental bandwagon. Environmental slogans can be read on many bumper stickers and heard over the radio. As a result, environmental awareness is on the rise. Being an environmentalist is no longer looked upon negatively, people's willingness to act in an environmentally sound manner has increased, environmental legislation seems to be responding more favorably to requests for stricter environmental laws, and many companies have responded by reviewing their line of products and production processes. To be pro-environment is "politically correct" and not necessarily anti-business as it used to be.

On the flip side there is a new rhetoric and propaganda that confuses many people. Since everybody now is an environmentalist, it becomes difficult to figure out whom to believe.[1] The root causes of environmental problems are complex and closely tied to unequal distribution of wealth and resources, poverty and exploitation, consumption patterns and principles of economic growth, cultural and individual outlook on life and other contributing factors. Without providing the proper socio-political analysis put in a historical context -- for this refer to Meadows et al., 1972; Schumacher, 1973; Humphrey and Buttel, 1982; World Commission on Environment and Development, 1987; and Spaargaarden, 1990 -- I put forward the thesis that it is in the interest of many corporations, politicians and legislators not to equate the environmental crisis with the factors mentioned above. This thesis is supported by the enormous emphasis that recently has been placed on recycling. By putting the emphasis on recycling, attention is drawn away from two other options that are from an environmental point of view far more promising: re-using and, better yet, reduction. These alternatives are not as interesting from a business perspective since they imply using up fewer natural resources and cutting production, thereby potentially undermining the economic growth principle upon which a capitalist society is founded. Recycling is a nice compromise for now: we -- I should say, some of us -- can still feel good about doing something for the environment, while we continue to grow economically and to live comfortably. The compromise is acceptable to the commercial world as well because there is money to be made

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[1] Examples of environmental confusion are numerous. Think of the plastic versus paper controversy. Plastics used to be considered bad, paper used to be good for the environment since paper bio-degrades. Now many plastics are recyclable and some of them are biodegradable (although some say that biodegradable plastic only breaks up in small pieces without ever really bio-degrading). As it turns out being biodegradable doesn't mean much in the tomb-like environment of a landfill, in which conditions are such that biodegradation of paper becomes virtually impossible. The University of Arizona's Garbage Project recently found twenty year old newspapers in a landfill. Researchers could still read the headlines!. It should be no surprise that people with good intentions towards improving the environment are confused when asked: "Paper or plastic?" at the grocery store.

Another example is the use of aerosol spray cans. Recently most U.S. manufacturers of spray cans advertise that their product does not contain the damaging CFCs and therefore is ozone friendly, suggesting that the spray cans of other companies are not. The fact is that CFCs have been banned in the U.S. since 1979 and that no spray cans contain CFCs. Instead they contain pressurized hydrocarbons which contribute to atmospheric smog.

in the recycling industry and, more importantly, the more people consume, the more people can recycle. . . The point is that resolving the environmental crisis is not as simple as we are perhaps made to believe, and that the fragmented and often contradicting pieces of information people receive can lead to widespread confusion.

Children, obviously, are not immune to the media attention, rhetoric and propaganda the environment has been receiving lately. They too watch the news, read the paper and listen to popular music which in at least some instances have turned green as well. They too are concerned about environmental issues and are probably confused by the mixed messages they receive. Environmental educators should take an interest in the images of concepts such as global warming, acid rain, pollution and recycling, students have in their mind as a result of their exposure to media, personal experiences and prior formal and non-formal education.

These images are particularly of interest in view of constructivist learning theories which are built upon the premise that people, prior to an educational exercise, already posses some knowledge and skills which to a large extent determine what they are able to learn at a given moment (Driver and Oldham, 1986; Wals, 1987). Ausubel goes even further by concluding that "the most important single factor influencing learning is what the pupil already knows." (Ausubel, 1968; vi). People actively construct their own meaning in an attempt to make sense of the world. The sense made of any event depends not only on the situation in which the event takes place, but also on the individual's purposes and active constructions of meaning. Prior experiences influence the way phenomena are perceived and interpreted. Posner and his colleagues argue that whenever people encounter a new phenomenon they must rely on their current concepts to organize their investigation of the world: "Without concepts the world is and remains ....blooming, buzzing confusion" (Posner et. al, 1982). Posner, borrowing a phrase from Toulmin, refers to those concepts as a "conceptual ecology." (Toulmin, 1972).

The views and ideas students hold have been given a number of names including alternative frameworks, children's science, alternative

conceptions, and mini-theories. They all stem from a constructivist epistemology that assumes that learners actively generate meaning from experience and that learning is the process of conceptual change.[2] Driver and Oldham found that "...some of the ideas used by children about the natural world are firmly held and often persist, despite science teaching... Thus, although for some children taught scientific ideas may be applied in stereotyped school contexts, for example, in examinations questions, such ideas are not applied outside the formal school setting to explain every day phenomena." (Driver and Oldham, 1986; 106). Without necessarily condoning the dichotomy between cognitive and affective domain that seems to be inherent to constructivist learning theories, I do see value in examining students prior experiences and perceptions from a constructivist perspective in the context of environmental education. For without an understanding of students' own ideas about the environmental crisis, it will be very difficult to provide meaningful learning experiences that will allow students to re-examine their own ideas and to acquire new ones.

This brings me to some of the questions that guided my research: What do the students from the four middle schools see as "environmental problems" and what kind of relationship do they see between themselves and these problems? How do they perceive environmental (including both the physical and the social) change? How do they see their own role within change? How do the different physical and social environments students inhabit influence the perceptions of their environment and environmental issues? After addressing these questions in this chapter I will generate some answers to the question: How can environmental education projects better build upon students perceptions and take into account the contextual differences that can be found within different school communities?

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[2] The process of conceptual change is at the core of many learning theories. Rumelhart and Norman (1981) suggest three ways in which cognitive structures may change: accretion (the addition of parts to an existing structure, tuning (involving small modifications to an existing structure) and restructuring (involving major changes in the structure of knowledge). There are parallels between Rumelhart and Norman's restructuring and Piaget's accommodation and even Kuhn's scientific revolution or paradigm shifts.

5.2. Personal Biases, Pre-Judgments and Purposes

Upon beginning the research in the suburban and city middle schools I reflected on the expectations I had about the differences in students' perceptions of environmental issues and environmental change[3] that could emerge in the interviews when comparing the city students with the suburban students. Again, without prior reflection on personal biases -- which are often shared -- I had towards the participants and how these biases might influence the topic of interest, the interviews could easily have become self-fulfilling prophecies. The reflections revealed some rather common generalizations that deserve mentioning here:

- The Forest Grove and Barnsley students live in areas where people live relatively comfortable lives and have the luxury to be concerned about environmental issues. The communities are relatively well off and can afford to set up highly visible recycling programs that catch the eye of the public. In the Detroit communities, on the other hand, people have to struggle to make basic ends meet (food, shelter, safety, etc.). Environmental issues are not a high priority: people have other, more important things to worry about.

- Environmental education and outdoor education have been an integral -- albeit peripheral -- part of many schools in communities such as Forest Grove and Barnsley since the early seventies. Inner-city schools do not have this same tradition in environmental education. Hence, the Detroit students' knowledge, awareness and understanding of environmental issues will be minimal when compared to that of the students from the Forest Grove and Barnsley schools.

- The students from the Detroit schools rarely leave the city and are very much confined to their own neighborhood environment, making it difficult for them to grasp the concept of global environmental problems. The students from the Forest Grove and Barnsley communities on the

[3] With perception of environmental change I mean the extent to which individuals think they can positively change their own neighborhood environment as well as the global environment either individually, collectively or both. The concept thus has strong ties with the popular empowerment concept which is not limited to environmental change, but in more general terms refers to an individual's perceived ability to make a difference in the world and one's perceived ability to determine one's own destiny.

other hand, have travelled to far-away places and are more in tune with concepts such as global environmental problems.

- Given the seemingly hopeless situation many Detroit students are in (deteriorating neighborhoods, high crime rates and drop-out rates, high unemployment, racism) with very few positive role models, it is unlikely that they think that they can affect positive environmental change in their community, not to mention change on a global scale.

These four generalizations would suggest that the Forest Grove and Barnsley students are more knowledgeable about environmental issues, are more concerned about environmental problems, and are more likely to think that they can affect positive environmental change. As will become clear in this chapter, these generalizations are far too simplistic and some of them turn out to be wrong.

5.3. Young Adolescents Talk About Environmental Issues

Again, most of the research findings emerged from the analysis of thirty in-depth interviews with students from all four Middle schools. Some additional findings are the result of two neighborhood walks with small groups of students from the Detroit schools. In Chapter I, I pointed out that my main concern was with the Detroit students for several reasons. To summarize those:

- Little research has been done about the way "innercity" youth perceive environment (including nature) and environmental issues, while there is a large body of research that focuses on "suburban" and "rural" youth.

- Environmental Education traditionally has been education for the privileged, e.g. those whose primary needs are met and can afford to worry about or care for the environment. Only recently the issue of environmental education and minorities has received higher priority on the agenda of organizations such as the North American Association for Environmental Education.

In analyzing the interviews I tried to capture the perspectives of the Detroit students, while contrasting and complementing theirs with those of the students living in the suburban Detroit communities of Forest Grove and Barnsley. Rather than using existing literature on the perspectives of "white suburban" students, I chose to approach the students directly with the same research technique I used in the Detroit schools. This allowed me to ask similar questions, make observations of the students, the school, and the neighborhood, that would be relevant to the research. In reporting my findings I will depart from the Detroit students' experiences and points-of-view while using the Forest Grove and Barnsley students experiences and perspectives as a contrasting reference point in an attempt to expose differences as well as similarities.

During the interviews we touched upon environmental issues on several occasions. After talking about the neighborhood and the things students liked and disliked about it -- which sometimes included environmental issues -- I would try to steer them away from the their local world by asking the question: "Moving away from your own neighborhood and looking at the world today as a whole, what do you think the major problems are?" The purpose of this question was to get a sense of whether the students' main concerns are of an environmental nature or of a different nature. If the students would focus on problems other than environmental problems, we would talk about those briefly. Later in the interview, I would ask something like: "Now, have you ever heard of global environmental problems?" This would give me a sense of whether omitting these types of problems in their response to the earlier questions was a result of the low priority the students gave to environmental problems or the result of the students not having heard about them.

There were also some students, all of them from the Forest Grove and Barnsley schools, who would focus *only* on environmental problems when asked: "Moving away from your own neighborhood and looking at the world today as a whole, what do you think the major problems are?" Since I knew that many of the Forest Grove and Barnsley students felt compelled to

provide me with what were considered by them to be the "right" answer,[4] I would ask them to consider problems other than environmental problems as well.

In addition to using these lead-in questions, I would also use the three pollution related pictures to get to their perceptions of pollution and environmental problems: one picture showing a dirty alley with a tipped over garbage container, one picture showing a point source of water pollution in a forest and one picture of oil refineries spitting out air pollution (Appendix B). These pictures led to discourse about water pollution, air pollution, litter and garbage. I often would stimulate the conversation by asking questions such as: "Do you think that you yourself contribute to pollution in any way?" "Do you know where the water goes when you flush the toilet?" "What do you do with your garbage at home?" "Where does the garbage go when you put it in the alley?" "Have you heard of recycling?" "Who do you think is responsible for cleaning up the environment?"

In reporting the results of the interviews and their analysis, I will first discuss the students' perceptions of and experiences with pollution. Before closing this chapter with the implications of the findings for environmental education, I will also discuss the students' assessments of their own roles as well as the role of others in contributing to and resolving the environmental crisis. This discussion builds upon the chapter about the participants' lives (Chapter III).

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[4] Many of the Barnsley and and Forest Grove students seemed to be aware of the "politically correct" thing to say to impress me as an interviewer. This to an extent contrived their answers. As I pointed out in the chapter III, their awareness of what I presumably would consider as a "correct" answer provides valuable insights:

- Apparently they seem to be familiar with conservationist views and concerns,
- They perceived me as someone who supports the conservationist view,
- They felt the need to impress me by giving me the "correct" answer.

This is not to say that the entire interview was contrived or that all the Bloomfield Hills and Birmingham students fit this pattern or that none of the city students adhered to any of these characterizations. The excerpts cited throughout this dissertation seem genuine expressions of concern, but on several occasions during the Bloomfield Hills and Birmingham interviews I became aware of potentially contrived answers that required extra effort on my part to solicit genuine responses.

5.4. The Concept of Pollution

The concept of pollution is complex, ambiguous and confusing. It is complex because of the many shapes and forms it can take, its causes and effects, and its interdisciplinary character. It is ambiguous because the term is subject to an array of interpretations that are often value-laden for political, cultural or socio-economic reasons.

A few examples may be useful. Depending on his political agenda, it may be fruitful for a politician to have pollution-control standards set at low levels to assure the support of companies whose profits may be hurt by higher standards (political/socio-economic value-ladenness). Another example of ambiguity as a result of socio-economic interests would be the fact that United States chemical companies sell pesticides, which are illegal in the United States, to other countries.

Examples of the cultural value-ladenness of the term pollution and related concepts are numerous as well. Think of the term "waste" for example. In western cultures "waste" often is viewed as something worthless (in terms of money), in non-western cultures waste is often viewed as something that cannot be used again (in terms of practical use). Consequently what is regarded by various cultures as waste may differ tremendously. Think also of our language which implicitly colors the beliefs and ideas about pollution-related concepts. Words such as garbage, trash, rubbish and waste have strong negative connotations for they all refer to something we need to get rid of rather than something we re-use. In this regard it would be interesting to compare the number of words one can find in American-English as synonym for garbage with the number of synonyms -- if any -- the Hopi Indians have for garbage. Finally, there is a common-sense epistemology in our culture as a whole that influences our thinking about pollution. Using a car, for instance, is adequate for many purposes we encounter our daily lifes. However, through advertisements and social conditioning, many people have come to believe that "you are what you drive" or that the car is the motor of our society ("the heartbeat of America is

today's Chevrolet"). As a result many people have come to worship cars and the infrastructure that has been built to accommodate them.

The interviews with the Detroit, Forest Grove and Barnsley students show that the students too are confused about the term pollution. They seem to struggle with the meaning of pollution, how they contribute to it, how it affects them and whether they can do something about it. The analysis of the interviews shows that there is not one single interpretation of pollution among the students, but, instead, a great variety of interpretations that vary significantly in the level of depth, detail and integration.

5.5. Level I: Pollution Can Be Touched, Tasted, Smelled or Seen

Many of the students define pollution as substances that can be either touched, tasted, smelled or seen, and that negatively affect the health of people. Litter, garbage, exhaust fumes from cars and buses, particles in drinking water, rotting materials, all can be sensed in one way or another. The visible, touchable and 'smellable' pollutants represent the most concrete forms of pollution. Just as dead fish in a river or dead trees in a forest represent the most concrete victims of pollution.

Arjen: "Is there any [pollution] in your neighborhood?"
Tasmika: "Well, this lady, she had a whole bunch of kids, her basement got so dirty... she had rats swimming in the water. My mother called the sewage people out 'cause she said it was stinking."(CMS_F_2).

Arjen: "..... have you ever heard of pollution?"
Maurice: "Yeah."
Arjen: "Now do you know what that means?:
Maurice: "Yeah, like trucks be going by and they let out all the fumes and it clogs up the air."
Arjen: "Does that affect you?"
Maurice: "I don't like it! But I can't do nothing about it."
Arjen: "But you feel like you can breathe it in sometimes when you walk by?"
Maurice: "Well, I feel like I am immune to it by now. I have been around it all my life."(CMS_M_1).

Arjen: "Do you know what [pollution] is?"
Horace: "Yes, people throw stuff in the water at the lake and something like that. And there's a lot of dirt and paper and all that in the water. Or just throwing

stuff, like say I had some paper and I just threw it on the floor, that's polluting something. But my daddy, he... like every weekend stuff is falling of the trees on the street, like (....) stuff like that and dead leaves falling, and he gets this thing and he'll blow -- it's like a blower -- and he'll blow all the leaves and stuff off the water. Or just paper that sits on top of the water, we'd pick it up. Try to keep the lake clean." (CMS_M_3).

Arjen: "How would you describe your neighborhood?"
Shauna: "Pitiful."
Arjen: "Yeah? What's pitiful about it?"
Shauna: "The trash and the people and all that. It's pitiful!"
Arjen: "Is it your block in particular or the whole area?"
Shauna: "The whole area. Everywhere you walk is trash. I mean dirt is everywhere. The people, (the homes) and stuff: trash everywhere."(HMS_F_3).

Maurice, Horace and Shauna are three Detroit students who illustrate that pollution can be sensed in a very concrete way. Many of the students have experienced pollution -- be it the act of polluting or the effects of polluting -- themselves. It is easier for them to relate to concrete examples of pollution that they have witnessed in their neighborhood or on their vacation than to relate to the non-visible and non-touchable forms of pollution that also are present in their surroundings (e.g. occasional high ozone levels in urban areas or acid rain). The students emphasizing the concrete presence of pollution also have concrete solutions for cleaning up pollution: litter can be picked up, water can be filtered and people should stop throwing stuff on the ground, and instead throw it in the garbage. These solutions may sound naive when considering the scope and complexity of the environmental crisis, but in the eyes of these students they are feasible and real. Clearly there are some alternative understandings that surface in the students' responses. Horace, for instance, thinks that the leaves pollute the water and that by taking a blower (air pollution...) and blowing the leaves off the water, his father helps to counter pollution.

The students who define pollution in very concrete terms also include relatively innocent or harmless substances in their descriptions of pollution. Several of the Detroit students mention mud, dust from a dirt road, dead

leaves, unkept lawns with grass growing haywire as examples of pollution. When asked whether they themselves contribute to pollution these same students will acknowledge that their personal behavior sometimes does pollute. Again, the examples of their own contribution to pollution are interesting for they point at a limited interpretation of pollution.

Arjen: "Do you think that you as an individual pollute?"
Whitney: "Yes, like if I am cold, I cough. Sometimes without covering my mouth."
Arjen: "Okay, does that pollute?"
Whitney; "Yes, there are germs."(CMS_F_7).

Arjen: "Do you pollute somehow?"
Bill: "In my house, yeah, but not outside. I will throw my stuff under the bed and I hide paper under the carpet and stuff that's about it."(CMS_M_5).

Arjen: "Do you contribute to pollution somehow?"
Hakim: "... I don't know, unless when we use the barbecue or the grill or something."
Arjen: "How about your parents' car?"
Hakim: "Well, it doesn't make any smoke unless it needs a tune up or anything."(HMS_M_4).

The excerpts above illustrate that these students are under the impression that they pollute and are willing to admit that they do. This notion sets them apart from several other students who are very detailed in their descriptions of all kinds of environmental problems, but do not think they themselves contribute to pollution. The excerpts also illustrate that these students only consider the visible and touchable to be pollution. The smoke from Hakim's barbecue is visible and therefore pollutes, the emissions from his parents' car, however, cannot be seen and therefore do not pollute the air. Bill thinks he pollutes when he hides paper under the carpet and throws stuff under his bed. Polluting here seems to be equated with "making a mess of." Making a mess of the air we breathe, making a mess of our room, making a mess of our alley, making a mess of the water we drink, all are examples of pollution. The students who think about pollution in this manner all agree that pollution is bad, that they themselves contribute to pollution and that the solution is to clean up our mess.

5.5.1. Garbage

The students who embody this concrete, personalistic interpretation of pollution have a fragmented, incomplete understanding of environmental problems. Far-away pollution is not a part of their world, neither are any other forms of pollution that cannot be seen, touched or smelled. Quite literally these students think that when it's out of sight, it's out of mind and no longer harmful. This way of thinking emerges when discussing garbage:

Arjen: "Do you throw your garbage away?"
Maurice: "I put mine in the dumpster. Most people, they send out their little kids, their little, little kids, to take out these big old bags with garbage and they drag'm in the alley and there be glass in the alley and the bag cuts and everything spill out and then they just put the empty bag in the garbage can and all that stuff lays around."
Arjen: "That's interesting. Do you think that when you put garbage in the dumpster like you're supposed to, that you, by doing that, you don't contribute to pollution?"
Maurice: "... I try not to 'cause by putting it in the dumpster, I figure well, I mean, you really won't be able to smell it if it's closed. And if they empty it regularly like they supposed to..."
Arjen: "Okay, suppose the city does come and they pick up the garbage; where do you think it goes?"
Maurice: "To the dump."
Arjen: "Does that contribute to pollution?"
Maurice: "Yes, that's where all the garbage goes. Garbage stinks!"
Arjen: "What does the dump look like you think?"
Maurice: "Well, I saw a dump by this freeway on the west side. It's... they just got all that stuff, they put sand on top of it. I guess that's supposed to kind of shelter out the smell, but it (won't stop nothing), it still stinks."
Arjen: "Do you think that garbage will disappear somehow?"
Maurice: "Nope, nowhere for it to go, nowhere else to go."
Arjen: "So the garbage will stay there forever?"
Maurice: "Aha. In my opinion, we have science and they say it's a couple of thousand feet down in the ground that you can dig until you get into the second layer down the crust, 'till you get into the second layer of the earth. I figure a couple thousand feet beneath the ground should be enough to put the garbage in to (conceal) it."(CMS_M_1).

Arjen: "Where do you think the garbage goes after they pick it up?"
Bill: "It goes to a big dump, like in a big yard. So nobody can get into it. It won't be by the house so people don't smell it and stuff like that. They put it somewhere where there's nothing around it so it would pollute nothing."
Arjen: "Do you think it will be there forever?"
Bill: "No, 'cause eventually somebody will pick it up 'cause they get tired of all the smells and all the cats get into it and all the rats. They put it somewhere else, they move it away from their property."(CMS_M_5).

Maurice and Bill illustrate the "out-of-sight, out-of-mind" perspective. By putting it in the dumpster properly and by closing the lid, you won't be able to smell the garbage. If the garbagemen pick up the garbage like they are supposed to, then garbage is not a problem. Many of the students, when asked; what happens to the garbage after it's picked up, will tell that it goes to a landfill. Landfills are a good solution for disposing of garbage in their eyes, as long as they are covered with soil so that people cannot smell anything. Maurice, who has been near a landfill, thinks the smell remains a problem even when the landfill is covered with "dirt" regularly. He thinks that garbage in a landfill will stay there forever and does not mention the possibility of biodegradation of organic waste over time. The reason he doesn't mention biodegradation is not because he thinks there will be little breakdown of organic materials in the tomb-like environment of a landfill, but because he is unfamiliar with the process. In Bill and Maurice's eyes the only problem with landfills is their awful smell and the rats they attract. Maurice's solution is to burry garbage deep in the crust of the earth. The students who operate within the personalistic perspective are unaware of the presence of toxins in landfills which can leech into the groundwater. Nor are they aware of the fact that many communities are running out of landfill space.

5.5.2. Air Pollution and Industry

Some of the students who operate within this personalistic, concrete orientation towards environmental issues have difficulty recognizing air pollution as an environmental problem. They know that visible smoke can be bad for your lungs and that bad air can kill trees, but they have trouble understanding the hazard of toxic chemicals that come from industries. When discussing a photograph of an industrial park consisting of oil refineries, students' perspectives of air pollution and industry emerged. The photograph is an aerial shot of oil refineries in a green setting Appendix B). The refineries stretch out to the horizon with light smoke coming out of some of the many smoke stacks. The horizon appears to be smoggy. Heavy metal structures are intersected by rail roads, two high-ways with very light

traffic, many patches of green grass and several rows of trees. I would ask all the students who participated in this study to look at the picture and to tell me what they saw.

The responses revealed an array of different perspectives that fit the three main levels of thinking that are distinguished in this chapter. On the one end I found a few Detroit students who after carefully studying the picture did not see any pollution in the picture. After asking them specifically, "Do you see any pollution in this picture?," they zoomed into the picture and pointed at some brown leaves on the ground or pointed at an area with "dirt" and "rotted grass" on the ground. These few students did not notice the air pollution at all. On the contrary, they would tell me how clean the picture was: no garbage and lots of green. Perhaps, the most striking comments from these students comes from Horace. Horace suggests that industrial places are inhospitable places where people are exploited for their labor. He does not see any pollution in the picture. The reason is that all people get to do in these places is work. Horace thinks that since all workers do is eat, sleep and work, they don't have a chance to pollute. It is not that Horace likes pollution, but he does see it as a symbol of a quality life in which people can have fun:

Horace: "I think there's not that much pollution because people don't get enough stuff. Not that pollution is nice and great or whatever. I think the reason why there's not pollution really because all these people do is go to work. Like here, they go to work, go right back home or whatever. And I think that they should be able to live in one part, in one neighborhood, together and know how to deal with each other. Try to keep it clean, try to keep the house clean and may be have fun, say in the summer. If you go here, you go here for the summer, you wouldn't really have nothing to do, but just look at all the stuff, the buildings and..... I don't think this would be a fun place to live. People just going to work; every day coming home, going to sleep, eat, go to work. I think that life is just more than just work, work, work. I think that you should go, at least be able to go places and have fun and may be learn some stuff for fun. You could go places and learn for fun and still go to work and it wouldn't have to be this kind of neighborhood. And I think you will see many people sitting outside or trying to. I don't think there's many people in this part of the world either. I think that people should be able to live here, be able to go to work, go to parks and stuff like that. I don't think the whole picture should be parks, but I don't think the whole picture should be buildings where you work either. I don't think that's fair because you come [across] places around here, you can go right up the street and see a park. Go down Conant and see a park. (And I think that part should be just like ours is)." (CMS_M_3).

Most of the other students did immediately mention air pollution and had mixed feelings about the picture. Some of the Detroit students who did recognize the air pollution as a major concern for the people living and working in the area were particularly ambivalent about the picture. Perhaps Whitney illustrates this feeling best:

Arjen: "Does it look like a good place or a bad place?'
Whitney: "Kind of in between because if it was a good place it wouldn't be smoking 'cause smoke pollutes the air. If it was a bad place, there would be someone running around shooting another person right here. So it's not really a good place and it's not really a bad place either."(CMS_F_7).

Arjen: "Do you think there's trash or pollution there?"
Gary: "The smoke that's coming out of the pipes, that would be pollution."
Arjen: "Would you feel safe there?"
Gary: "No, 'cause if you had a home not that far away from there and something would happen, you wouldn't be able to get far enough to where you would be safe. All of this equipment would probably spread out real fast and stuff." "Somebody cold put a whole bunch of bombs in it and just blow it up for some reason."(HMS_M_6).

Perhaps the most striking aspect of the above excerpts is that, even though both Gary and Whitney recognize that there is air pollution in the picture, their main concern is with the people who could hang around such places and run around shooting or blowing up the place. Air pollution is bad, they seem to say, but the real danger occurs when, as a result of criminal activity, things blow up and spread out to areas where it could affect other people.

Other students who did recognize the air pollution in the picture immediately would talk about the health effects on the people working and living in the area, but would not worry about the pollution spreading out to other areas or worry about its effects on plants, trees and animals. One student suggested that if it weren't for the smokestacks all the pollution would stay in the factory and the employees would die.

Arjen: "Do we need clean air?"
Carol: "We do, but that reflects off because in industries there's not gonna be clean air because somehow there's gonna be pollution in the factories and they've

> to get it out somehow, so like, you know, the factory workers don't die or anything, but that kind of is a problem."(DMS_F_3).

None of the students who think at this level, question the presence of industry or the technical rationality that guides "progress." They regard the presence of industry as a natural response to increased demands for products and food, without considering, for instance, a change in lifestyle. Environmental problems are physical problems that seem to occur naturally without any form of ethical control. Environmental problems are not viewed as problems of human nature or as cultural problems.

Ironically, many of the things students operating at the most concrete level of understanding are concerned about (litter, mud, dirt, wild grass, rats in the basement, the smell of rotting substances) are trivial from an environmental point of view. Yet, they are real concerns that illustrate their environmental awareness and bring an element of environmental guilt[4] to their lives. A question that comes to mind is whether this awareness combined with some guilt is a healthy starting point for environmental education programs?

This more personalistic perception of pollution appears to be strong among many of the Detroit students and among a few of the Forest Grove and Barnsley students. This way of looking at pollution appears to point at a smaller conception of environmental issues with limited detail which is nevertheless of an immediate near-by scope to the students who display it. It is possible that some of the students play a language game in displaying knowledge of environmental issues at all three levels that are discussed here. Nevertheless, many of the stories students tell suggest that they have had direct, personal experiences dealing with pollution and environmental issues which shape their thinking about these issues. I will now move to another, broader and less disparate perception of environmental issues that emerged from the interviews.

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[4] With environmental guilt I refer to an individual's feeling of guilt that results from his believe that his own behavior contributes to pollution or deterioration of the environment, regardless of whether this behavior negatively affects the environment in real terms.

5.6. Level II: Pollution Can Be Invisible, Move Around and Accumulate

To many of the students pollution is more than the visible, touchable and smellable substances that are somehow harmful to people and animals. Pollution also includes substances you cannot see, touch, taste or smell. Out-of-sight, to these students, doesn't mean that it's gone forever. Pollution can spread via air and water to far-away places. Pollution accumulates over time and will eventually get all of us in trouble. Their own connection to pollution is less linear than the connection the students in the prior section perceived, in that these students acknowledge that there are many indirect ways of polluting as well. The solutions to pollution are not as easy as just cleaning up your room or picking up litter, but are recognized by the students to be complex. The students who think at this second level about pollution also tend to use words such as: habitat, ecosystem and biodegradable, and are aware of specific global environmental problems. What follows are excerpts from the students who ascribe to pollution the qualities described above.

Arjen: "Do you as an individual contribute to pollution?"
Roger: "Yeah, I have...., for example, when I ..., fire gives off pollution and many times I built a fire in the fire place. And, I have got a little airplane, a small one, and it works on gasoline and that probably also pollutes, even though I don't use it much. And also electricity, the way we get electricity is what, with the storage of the things, is definitely polluting, and also, sometimes, getting water also pollutes."(DMS_M_7).

Roger shows that his understanding of pollution goes beyond what can be concretely sensed when he mentions that the way we obtain electricity contributes to pollution as well. When you watch television, you are indirectly contributing to pollution, Roger would acknowledge. Rob suggests that getting rid of garbage is not as simple as burying it or burning it:

Arjen: "Do you contribute to pollution as an individual? Somehow?"
Rob: "I don't throw anything like... the only time that I ever throw anything in, you know, the garbage is in the trash. I'm not one who driving on the highway is done with a milk shake and just throws it out..."
Arjen: "By throwing it into the garbage, do you think you don't contribute to pollution?"

Rob: "I think you still do, but I don't know what else to do with it 'cause if you burn it then you contribute to air pollution and if you bury it, you're contributing to water pollution, and there's just, there's nothing to do with it."(DMS_M_8).

Both Rob and Roger suggest that polluting is inevitable. They and several other students seem to say that you cannot not pollute. At most you can try to minimize your own contribution to pollution. The students who think about pollution as being inevitable also see it as a threat on a global scale. Mainly through the media and sometimes via school and their environmentally-outspoken idols[5] they have come to perceive pollution as a major threat.

Arjen: "You mentioned air pollution: What do you mean by that?"
Alicya: "Air pollution is building. Using all aerosol can sprays, Styrofoam; you drink it and they burn it up, and spilling oils in the lake and destroying of the ecosystem and polluting the air. That ozone is destroyed by that and (that) brings more (downward) rays into the earth and sometimes it can cause skin cancer and some people die."(HMS_F_1).

Bryan: "Yeah, I guess I contribute to the problem, but, you know, I try to stay pretty much involved with save-the-rain forest and stuff. I follow that, like, Rolling Stone magazine and, you know, the news." [Rolling Stone magazine], they follow a lot of things and now, Sting, he's a music guy, he has gotten involved with the save-the-rain forests. So they have had articles in there and in other magazines." "You can send help and help save it and it has Greenpeace advertisements in it. You can buy, like, a ring of five trees. In Israel, I think, they said they were trying to re-populate the desert with trees or something. Me and my brother are thinking of sending plants and trees there."(SDCD_M_8).

I should note that the students' perceptions of pollution are not solely determined by what they hear, read or see on TV, but also by their own experiences. Several students talk about breathing in exhaust from cars, the different air quality in the woods in northern Michigan, the polluted river, the fish they catch with tumors on their backs, and the algae blooms in the pond behind their house. One of the Detroit students, curious about whether there was air pollution in her neighborhood which she could not see or

[5] Some of the Barnsley and Forest Grove students make reference to rock stars who have made the environment their main cause. Events like "Band-Aid" and the Greenpeace concert in the Soviet Union apparently have had an impact on these students. Their favorite bands, such as U2, Midnight Oil and Sting, are very outspoken against things like depletion of the rain forests and the hunting of whales.

smell, came up with her own "scientific" experiment using gold fish as bio-indicators:

Tasmika: "..... Cars go around blowing [stuff] in the air we have to breathe in, killing fish for that reason, stuff like that."
Arjen: "How do you mean, killing fish?
Tasmika: "Well, I took my fish out on the porch one day to see if people pollute the air -- I only had one, it wasn't mine though, it was my sisters -- sat it on the porch, in the back porch, the sun porch, and opened up all the windows on the back porch and when I came back in he was dead."
Arjen: "So what did you do? Tell me again, I don't get it."
Tasmika: "The air came in and got in his water!"
Arjen: "Okay, so you had like an aquarium...?"
Tasmika: "Yes and killed him."
Arjen: "So, within hours or days or what?"
Tasmika: "Two days."
Arjen: "So you think air pollution got into the water?"
Tasmika: "Yes, 'cause I fed him. I only feed him tea spoons, like little table spoons... and then I just drop it in there. And I took eight of'm 'cause we had nine, I took eight of 'm and I put'm in a little aquarium and I took that one fish and put it right there. And the water was clean 'cause I cleaned it out before I put him in there...."(CMS_F_2).

The students who have a broader understanding of pollution seem to be able to distinguish between serious pollution (ozone depletion, acid rain, toxic waste) and not so serious pollution (litter and trash). When asked; what is pollution to you, they do not think of litter or coughing, but instead mention more severe problems related to water and air pollution.

Arjen: "Have you heard of pollution?"
Latoyah: "Yes."
Arjen: "What does that mean to you?"
Latoyah: "The ozone layer breaking down and fish dying in the river and acid rain."(HMS_F_5).

The students who mention problems such as acid rain, ozone depletion and global warming usually have an incomplete understanding of what these problems are, how they are caused and the effects they might have on life on earth. Through the media many of the students have picked up bits and pieces of information about global environmental problems. To some this scattered information doesn't make much sense, while others have been able to synthesize it into a more or less coherent understanding. Nevertheless, all students who are aware of these problems do fear them and are concerned about them.

5.6.1. Acid Rain

Many of the students think that acid rain is rain that has turned acidic as a result of air pollution. Quite literally, they imagine that smoke from smoke stacks gets in the air where it mixes with the clouds. When it rains the water coming down is polluted. Most students believe that acid rain falls in the immediate surroundings of the pollution source. In the students' eyes acid rain does not reach far away, rural places. According to many of the Detroit students and some of the Forest Grove and Barnsley students, the effects of acid rain affect people directly. Acid rain messes up your car by damaging the paint and causing rust, it messes up your hair, it makes things dirty, and it affects your personal health when you drink it.

Arjen: "Have you heard of Acid Rain?"
Jim: "Yeah, where acid gets evaporated with the rain and it comes down as chemical rain." "...It kills trees. It could affect you. It could affect your car, your hair. It could affect your body, your clothes, the streets, the grass, living things, your house. It could eat the wood away from your roof."(SDCD_M_1).

Arjen: "Have you heard of Acid Rain?"
Whitney: "Acid rain, I have heard of it because one time I walked down to get my hair wet and my mama said: why do you want to get your hair wet, you never know your hair might be falling out because acid rain could take your hair out." I said: "What's that?" and she said: "Rain with acid in it." So, I washed my hair."
Arjen: "Why do you think the air (!) becomes acidic?"
Whitney: "The air is polluted and when the rain comes down the rain takes in the air and when it comes down it gets a lot of polluted stuff."(CMS_F_7).

Maurice: "Yeah, I have heard of [acid rain]" "The rain, some of the rain is unpure and comes down and deteriorates the paint on the cars."
Arjen: "What do you think makes the rain acidic?"
Maurice: "...It could be a storm where the polluted air goes up in the air and a storm come down and the rain just be messed up."(CMS_M_1).

The students know that air pollution is the cause of acid rain,[6] but they do not quite know what kinds of air pollution contribute to acid rain.

[6] To add to the confusion about acid rain, I should note that rain naturally is slightly acidic with a normal pH range that lies between 5.3 and 5.7. This means that all rain is acidic to begin with. Scientists generally refer to rain with a pH lower than 5.3 by using the phrase *acid rain*.

Smokestacks belching out thick smoke generally are perceived to be contributing to acid rain, but exhaust from cars or air pollution from cattle ranches are not. The notion that several students have of acid rain contributing to car damage, rather than cars contributing to acid rain, is striking.[7]

Only a few of the students who are familiar with acid rain do not only think of the effects acid rain may have on humans, but also mention the effect it may have on wildlife and crops. Particularly fish may be the victims of acid rain when the rain drains into a river.

Arjen: "You mentioned a couple of big problems, acid rain, for instance, do you know what that is?"
Latoyah: "Big industries dump that stuff where it's not supposed to be dumped and it absorbs into the clouds."
Arjen: "Then what?"
Latoyah: "Acid rain!"
Arjen: "Is that dangerous or something?"
Latoyah: "It's dangerous when it's going into the river, killing fish and stuff."
Arjen: "Could it affect you?"
Latoyah: "If we drank it."

Hakim recognizes the effects acid rain can have on crops as well. In addition he sees a connection between acid rain and the occurrence of drought. Although droughts are generally associated with global warming, it is not surprising that Hakim makes the association with acid rain considering that he believes that acid rain leads to the destruction of crops which often is connected to erosion and desertification.

Arjen: "Have you heard of Acid Rain?"
Hakim: "Yes, I've heard of it."
Arjen: "Do you know what that is?"
Hakim: "Well, acid rain is when the chemicals of certain companies get mixed in with the clouds, then the rain has chemicals in it. Some are harmful and it messes you up real bad."
Arjen: "What kind of effect does that have?"
Hakim: "I think it could kill crops and [lead] to droughts or something like that."

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[7] From an environmental point of few thinking that acid rain damages cars, as opposed to thinking that cars contribute to acid rain, may look absurd, but technically the students who claim that acid rain causes cars to rust more quickly or leads to paint damage, may very well be right. In their support, it should be noted that cars are not the main source of sulphurdioxide which causes acid rain. The main source is coal burning plants.

Generally acid rain is viewed by these students as a toxin that can lead to some kind of toxic shock that will instantly kill organisms upon contact. Again, this is a misconception of acid rain in that it is not a toxic substance and its effects on ecosystems and buildings do not occur overnight. The students also seem to think that the only sources of acid rain are immobile point sources such as smokestacks. They do not consider moving point sources, such as cars, or non-point sources, such as cattle farms, to be contributors to acid rain.

5.6.2. The Hole in the Ozone Layer and Global Warming

Students who think about pollution at this level are also aware of the hole in the ozone layer and global warming. The reason I lump these two environmental problems together is that the students have difficulty separating them and generally consider them to be the same problem with different names.[8] Again, their understanding is fragmented and incomplete, but sufficient enough for them to realize that these are global problems caused by human activity that could affect us in serious ways.

Arjen: "How about the ozone layer, what do you think that is?"
Latoyah: "It's a shield that protects the earth from harmful sun rays."
Arjen: "So what would happen if you get a hole in the ozone layer?"
Latoyah: "There already are a few holes in the ozone layer and it's causing global warming."
Arjen: "Do you think that's a bad thing global warming?
Latoyah: "Yeah, because it makes the polar caps melt and will flood the earth." "It will probably happen sooner or later."
Arjen: "What causes it?"
Latoyah: "The first thing that started it was those spray cans like (Lysol) spray cans and pollution. I think those are about the two things that started the break down." (HMS_F_5).

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[8] In all fairness to the students who have difficulty separating these problems, global warming and the hole in the ozone layer are technically related: CFCs which breakdown the ozone layer are also a greenhouse gas (albeit a minor contributor). Recently some studies have suggested that "patching up" the hole in the ozone layer could actually make global warming worse, if the amount of greenhouse gasses remains the same. In other words: the hole in the ozone layer reduces global warming. . .

Arjen: "Looking at the world today; what do you think are the major problems?"
Gary: "The drug problems and... the problem I'm most concerned about is that hole in the atmosphere, I think it's in the atmosphere..."
Arjen: "The ozone layer?"
Gary: "Yeah, that's it, the ozone layer."
Arjen: "Why does that worry you?"
Gary: "Because they say that the world will come to an end soon if that hole doesn't get patched up and stuff."
Arjen: "How did it get there?"
Gary: "Hair sprays, paint spray and when you start up your car, all the smoke from the exhaust goes up into the air."
Arjen: "How would that affect people you think? That hole?"
Gary: "How? I can't really say."
Arjen: "But you have heard somewhere that that might lead to the end of the world?"
Gary: "Aha."
Arjen: "Where did you hear that?"
Gary: "I think I heard it either on the news or I read it in the paper."(HMS_M_6).

Gary and Latoyah are two Detroit students who are very concerned about the hole in the ozone layer. Latoyah envisions several holes in the ozone layer which according to her is a protective shield that keeps out harmful sun rays. She thinks the holes are caused by the use of spray cans and by pollution in general. Her use of the words "break down" suggest that she imagines a chemical reaction that breaks down ozone. All in all a fairly accurate description of ozone depletion, even though today's spray cans, at least in the U.S., no longer contain ozone-damaging CFCs. Like many of the students she thinks the spray paints used for writing graffiti on the walls and hair sprays are bad for the ozone layer. Coolant fluids in refrigerators and air conditioners are not mentioned by any of the students as being damaging to the ozone layer. Despite her apparent understanding of ozone depletion, she does somehow relate the problem to global warming by suggesting that the holes in the ozone layer actually cause global warming. She does associate, correctly I should say, global warming with temperature rises on earth, the melting of the polar ice caps and the subsequent flooding of coastal areas.

Gary thinks the holes in the ozone layer could lead to the end of the world, but he doesn't know how. He literally thinks that we need to "patch up" the hole if we are to avoid a catastrophe. Like many students who worry about ozone depletion, he thinks that spray cans and other forms of air pollution, such as car exhaust fumes, cause a hole in the upper atmosphere.

None of the students in the study mention high ozone levels in the lower level of the atmosphere, which are the result of conventional air pollution, as a problem. This is interesting to note since in urban industrial areas, high ozone smog levels in the lower atmosphere are a far more immediate personal threat than the hole in the ozone layer. It should be no surprise to environmental educators that students will be confused to learn that under certain weather circumstances urban areas may have dangerously high ozone levels (some news papers actually include ozone levels in their weather forecasts), while at the same time there is an ozone shortage in the upper atmosphere. Is ozone bad or is it good, many students will wonder.

Both Alice and Jim equate the greenhouse effect[9] with the ozone layer. Alice, like many people including many adults, refers to the hot summer and drought of 1988 as evidence of global warming in action while this event in itself doesn't provide any long-term evidence of global warming. Like several other students, she quite literally believes that the result of global warming will be that we will die of heat.

Arjen: "Have you heard of the greenhouse effect?"
Alice: "Yes, about the ozone layer. When they make so much pollution that it keeps in the hot air and we get high temperatures in the summer, like we had last year [1988, aw]."
Arjen: "Would that be bad?"
Alice: "Yeah, because there's so much pollution that if we don't stop, it will build up and it will get hotter and hotter and we will die of (heat)."(SDCD_F_5).

Jim also confuses the break down of the ozone layer with the atmospheric greenhouse effect. He seems to refer to two processes that occur simultaneously without really understanding either one of them:

Arjen: "Have you heard of the greenhouse effect?"

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[9] The term *greenhouse effect* again is confusing to many students. To students familiar with the problem of global warming, greenhouse effect has a negative connotation: heat trapped in the atmosphere as a result of air pollution, ultimately leading to flooding and change in growth seasons. Students unfamiliar with global warming equate the greenhouse effect with greenhouses where people grow vegetables and flowers. The process is the same albeit on a different scale. The greenhouse effect in itself is not a bad process for life on earth. As a matter of fact, without a greenhouse effect, life on earth as we know it would be impossible.

Jim: "Yeah, the greenhouse effect. We are destroying the ozone layer. We are actually building it up and then the sun comes in, but it can't get out so it gets hot in the air and it gets too hot to the point where living things can't live as well. They get a long growing season and stuff and it gets real hot."(SDCD_M_1).

On the one hand we are building up a kind of shield that traps heat in the atmosphere, while on the other hand we also are breaking down a protective ozone shield that filters out harmful radiation. Jim does not mention the risk of flooding as a result of global warming, but he does mention its effect on the growing season.

Paul, again has a different understanding of the greenhouse effect. His interpretation is that as a result of pollution heat literally gets trapped under clouds. The problem in his eyes is not that the climate will change or the growing season will be affected, but that the pollution gasses will be unable to escape from the atmosphere and will build up in such high concentrations that we all will get sick:

Arjen: "Have you ever heard about the greenhouse effect?"
Paul: "Yeah."
Arjen: "What does that mean?"
Paul: "It's when heat gets trapped under clouds."
Arjen: "And then what happens? Why is that bad?"
Paul: "Because it keeps all the gasses in the air and we have to breathe all that, so that makes us sick I guess."(SDCD_M_3).

The students who think at level II about pollution have a fragmented general understanding of the hole in the ozone layer and global warming. They know both phenomena are the result of human activities that lead to air pollution. Taken together, they have a good idea of the effects of both processes: the melting of the polar ice caps, flooding, climate change, different growing seasons, and poorer air quality. The students have in common that they cannot really distinguish global warming from the hole in the ozone layer and that they do not really know what the exact causes are of both environmental problems. Yet, they can be set apart from the students who think at Level I about pollution in that they do know of the existence of both global environmental issues and are able to provide a general, albeit somewhat inaccurate, description.

5.6.3. Cutting Down the Rain Forests

Virtually all the students who participated in the research ascribed to trees the quality of being able to produce oxygen. Yet, there are some students who have not heard of the rain forests and the problems that result of humans cutting them down. The students who think at this level do know about the negative environmental impact cutting down rain forests may have. As is the case with the hole in the ozone layer, global warming and acid rain, the students have a fragmented understanding of the issue that is based on the bits and pieces of information they receive at school, from watching the news, reading the paper or a magazine and/or from listening to their environmentally-conscious musical idols.

Arjen: "How about another one: the greenhouse effect?"
Maurice: "Yeah, I know what that is: tearing down all the trees."
Arjen: "What happens then?"
Maurice: "No oxygen. Well, it's oxygen but not as much. They [the trees] won't be giving off that much [oxygen]. There won't be a lot of trees left to give off oxygen and it would be a loss of (.....) and it's really helping to counter the pollution."(CMS_M_1).

Maurice links the greenhouse effect to the cutting down of trees which produce oxygen and counter pollution. Although there is a relationship between the two, the greenhouse effect is more than just the cutting down of trees. Maurice and many of the students in all four schools think very positively of trees. Trees, these students maintain, produce oxygen, counter air pollution, provide shade on a hot summer day, and are esthetically pleasing. The presence of trees in an industrial area to some students suggests that the people living and working there are trying to combat air pollution. Interestingly enough it does not occur to some of the students that air pollution might actually kill trees. This became apparent when the students reflected on the photograph with the oil refineries. Again Maurice, a little later in the interview:

Maurice: "Yes, but I have noticed they have all these trees around." "It looks like they are countering, they are trying to counter the air pollution."
Arjen: "Is there a way we can have both clean air and industry?"

Maurice: "Yes, by making the industry around forest areas with a lot of trees and green."
Arjen: "So if you build industries near forests..."
Maurice: "Yeah, like in this picture."
Arjen: "Okay, then the forest would help clean the air pollution?"
Maurice: "Well, it would take it down some. It won't totally wipe it out, but it would take it out some."
Arjen: "Do you think it could kill the trees in the forest?"
Maurice: "Hmm..... never thought of that. Probably, I don't know bad air..."(CMS_M_1).

Gary shares the idea of trees countering air pollution in industrial areas:

Arjen: "What do you think of all the green there: the trees and the grass?"
Gary: "The trees would be useful 'cause they give more oxygen and fresh air. Probably if they wouldn't allow trees, that pollution there would get to some people and they would want to move away."(HMS_M_6).

The students who are aware of the rain forest problems tend to focus on the lack of oxygen that might result from cutting down entire forests and not on high carbondioxide levels, vanishing species, threatened indigenous peoples, or the loss of genetic material that could have possible medical purposes. A few students link the cutting of the rain forests to desertification.

Arjen: "You mentioned the rain forests, that's interesting: Do you think the cutting down of the rain forests -- which really is tens of thousands of miles away from here -- does that affect you here somehow?"
Sandra: "I think so because our oxygen is affected by the trees, so that the trees can help us and so when you cut down the trees the trees won't be able to help us breath 'cause they make the oxygen and the air won't be as good."
Arjen: "Why do you think the people there cut the rain forests?"
Sandra: "To have more space for buildings and to use it may be for buildings and more supplies."(SDCD_F_2).

Arjen: "Have you heard of the rain forests?"
David: "Yeah, we are cutting down the rain forests and that's cutting down the oxygen in the world."
Arjen: "Who's cutting down the rain forest, you think?"
David: "Developers who want to develop more and more in Africa, and I think, I read somewhere that 40 percent of the earth's oxygen comes from the rain forest." (SDCD_M_4).

Arjen: "Why is it bad to cut the rain forest?"
Bryan: "Well, the trees produce oxygen, so, you know, it takes in the carbondioxide and makes oxygen. So it you have nothing left to make Oxygen then I guess you're in a world of trouble."(SDCD_M_8).

Arjen: "Moving away from your neighborhood and looking at the world as a whole; what do you think are the big problems in the world today?"
Hakim: "Well, I'd probably say the pollution 'cause all the rain forests are getting cut and the resources are just drying up."
Arjen: "Why does that concern you?"
Hakim: "Because when I am older I don't want to live in a world where you have to stay in your house or where you can't go anywhere: it would be like a big blizzard of sand."
Arjen: "Why do you think people cut down rain forests? Why do they do that?"
Hakim: "Well for the timber."
Arjen: "And why is that bad for the environment to cut down forests?"
Hakim: "Because the trees and the plants give off oxygen and if they cut down all the trees and build up these big old plants, all they're gonna do is chug smoke and it's gonna make more smoke in the atmosphere."
Arjen: "Where in the world do they cut down those forests?"
Hakim: "In South America."(HMS_M_4).

The students have a very limited understanding of why people cut down the rain forests. Whereas the students who think at the personalistic level described earlier, have not heard of rain forests at all or have only heard about them in the context of a science class as being a special ecosystem with a special climate, the students at this level think there is something terrible happening far-away that will affect them, even though they do not fully comprehend what the problem is. In answering the question: "Why do people cut down the rain forests?," the students do not mention the commonly heard reasons: to raise cattle for cheap hamburgers, to plant new crops for export purposes, to export tropical hard wood or to pay off national debts. Instead, they think the forests are cut for timber, for developing new urban areas or for creating tourist resorts in tropical areas. Consequently, they do not see a possible link between, for instance, eating hamburgers or buying furniture made of tropical hardwood, and the cutting down of the rain forests.

5.6.4. Garbage

The students who think about pollution at this level, think about garbage differently than the students at the personalistic level discussed earlier. They do not think that once you put garbage in the alley or on the street in a properly-closed garbage container, it is gone forever. Instead they

see the putting of garbage on the street as an intermediate stage in a process that ultimately leads to pollution. To these students out-of-sight is not out-of-mind:

Arjen: "Do you have any idea where the garbage goes to when it's picked up at your house?"
Tanya: "Well, I have seen the trucks they have these big.., looks like a cone or something, that they dump into, but they saying its full and they dumping it into the ground and then they're making these big old hills and things and I think it shouldn't be like that. They should have a place where this garbage can go."(HMS_F_2).

Arjen: "Do you have any idea where the garbage goes?"
Charlotte: "Well, I have heard, my dad, I have heard a lot about about that in science. But my dad told me about landfills and how they have problems with those."
Arjen: "So your dad told you that landfills are a problem?"
Charlotte: "Yeah."
Arjen: "Can you think of any other solution then collecting it and putting it in a landfill?"
Charlotte: "Well, they talked about, like, dumping some stuff in the ocean and stuff. And I always thought that was a bad idea 'cause that's just like ruining the environment, like the ocean life, but I really don't know what to do with it. It's kind of a hard thing [Frustrated]."(DMS_F_5).

Jim in reflecting on the photograph showing oil refineries with smoke stacks polluting the air:
"Looks like an industrial area. Looks like it's polluting the air here over here and look all the smoke pipes that are polluting the air. I mean it's not a big concern now, but soon it will be. I mean air pollution is getting so high 'cause, you know, people are burning up their waste and just getting it into the air..."(SDCD_M_1).

Garbage poses a problem even after it is collected. Some of the students do mention incineration as an alternative to landfills, realizing that burning things causes air pollution. The landfills, so they have heard, cause a problem as well, but they do not know what the problems with landfills are other than that the garbage is "just sitting there." Like the students in the earlier section, these students have not heard of possible water pollution as a result of the leeching of toxic materials or the fact that many counties are simply running out of landfill space. I did not get a sense that the students were aware of the enormous amounts of garbage people accumulate over time.

5.6.5. Industry and Air Pollution

When looking at the photograph with the oil refineries, the students who think about pollution at this level express a deep concern about what goes on in the picture. The students are aware of the fact that there are different kinds of smoke and that some of them might contain dangerous chemicals. The students also know that the air pollution does not stay near the factories, but can spread out to other places. This stands in sharp contrast to the students in the previous section who, if they would recognize air pollution in the picture at all, thought that it would only affect the health of the workers and people living near the factories. Students' reactions to the picture here focused immediately on air pollution and not on the also striking amount of green grass and trees:

Peter: "..... a lot of pollution, ... nuclear waste .... A cancer, and that's what is killing the earth. That is cancer, like a tumor on earth that would be.." (DMS_M_2).

Arjen: "How do you feel when you drive through such an area?"
Roger: "... Well, it looks like that and you see all the smoke coming out and you wonder: How much damage is it doing to the environment?"(DMS_M_7).

Bill: "That's a lot of factories and smoke having chemicals in it and it pollutes the air. It could get through an open window and there might be somebody and it would make their lungs go bad."
Arjen: "Do you think it could affect the trees nearby?"
Bill: "Yes, 'cause the smoke will rot the wood and branches will break 'cause they are weak and the leaves will crumble up and the trees will only have branches."
Arjen: "Could that be near Detroit, something like that?"
Bill: "Yes, 'cause there are a lot of car factories; Chrysler, Ford and Chevrolet, and the milk factories and when they work on the roads they use a machine that spits out chemicals 'cause it makes smoke."
Arjen: "Do we need industry you think?"
Bill: "Yes, 'cause the metal builds houses and it makes roads and it builds bridges, so you can make cars."
Arjen: "Do we need clean air?"
Bill: "Yes."
Arjen: "So how can we have both, you think?"
Bill: "Put the factories somewhere, like, in the abandoned areas where nobody lives, instead of near houses."
Arjen: "Do you think the pollution in the picture will stay or go to other places?"
Bill: "It will travel, but not far 'cause it would disintegrate."(CMS_M_5).

To many of the students heavy industry symbolizes pollution, something evil. Peter uses the metaphors "cancer" and a "tumor on earth" to describe the picture. Somehow he associates heavy industry, with nuclear waste which in the eyes of many students is the ultimate form of life-threatening pollution. When Roger drives by an industrial area he wonders what harm is being done to the environment. Bill thinks that the smoke from the factories will literally get into people's homes through the window and damage their lungs. Like most students he does not challenge the need for industry, but he does challenge the location. In his mind people should relocate industries to "abandoned areas where nobody lives." Apparently he is more concerned about the people living near industry -- the students from his school live less than half a mile away from a Chrysler plant -- than about the people who work there or the trees,[10] plants and animals living in those "abandoned areas."

Bill also introduces the term "disintegration" which like biodegradation suggests to many students breaking down into smaller units that are no longer harmful to the environment. Most students do not know which substances biodegrade or disintegrate and which ones do not. Nor are they aware of the fact that the smaller resulting units can still be harmful to the environment. Although I did not spend much time discussing this with the students, I did get the feeling that they did not have a sense of how much pollution is too much for the earth to be able to assimilate and for people to become sick, but then again, neither do the experts. Particularly when talking about pollution standards which are often defined in parts per million or parts per billion, students may need to be given concrete examples of what those concentrations mean in relative terms.

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10 Tony does acknowledge that air pollution can kill trees, while he does not mention the possibility of trees combatting air pollution, like several other students do. It is interesting to examine his description of how air pollution can affect trees: *the smoke will rot the wood and branches will break cause they are weak and the leaves will crumble up and the trees will only have branches."* This is exactly opposite of what actually happens when trees are affected by air pollution: the leaves crumble up and die first and then the wood starts rotting and branches fall off. Nevertheless the end result is the same in both scenarios.

Since most of the students think the presence of industry is inevitable and necessary, while at the same time acknowledging that industry pollutes, it is interesting to look at the way they resolve the apparent conflict between industrial activity and a clean environment. Students will all agree that we need clean air and that we need industry, although some students raise some questions about the things they produce and the environmental ethics of industry (see the level to be discussed next). I would usually ask the students at some point during the discussion of the oil refinery picture whether there is a way we can have both industry and clean air. The following excerpts deal with this question:

Alice: "This looks like plants and stuff. It looks like they are polluting the air there. And, like we were talking about before, I think they should try to do something about that because it's just hurting everything. People and animals breath it and it's really, really unhealthy."
Arjen: "Do we need industry?"
Alice: "I think so, because we wouldn't have, well, actually, the Indians didn't have it [smiles], but I think right now we need it, like everybody has a car and everything, without cars we couldn't get anywhere. We depend on it to make stuff for us. So I think we do need it."
Arjen: "Do we need clean air?"
Alice: "Yes [smiles]."
Arjen: "Do you think there's a way we can have both industry and clean air?"
Alice: "I think so, like I said before, to get this clean air [filtering] and when everybody cooperates and helps, I think we could achieve it."(SDCD_F_5).

Arjen: "Do you think there's a way we can have both clean air and industry?"
Hakim: "I think that they should develop something that if they are gonna use these chemicals, they should do something to contain them. Contain the smoke and all that stuff."
Arjen: "So rather than spitting it out in the air, put it some place and store it?"
Hakim: "Well, I think there should be some kind of way to regenerate it so it can be used for other purposes like for energy in the plant or something."(HMS_M_4).

Arjen: "Do we need industry?"
Carry: "Yeah [hesitantly], in a way we do, but then [consider] all the wrong things it does... it affects the earth so... I think we do need it to produce things and we need faster ways of growing food and crops, but, I don't know, it seems we don't need it to such an extent, but it so much ..... (we can't) do anything about it."
Arjen: "Do you think there's a way we can have both industry and clean air?"

Carry: "I suppose so because there are so many other things we have done. But, you know, I can't, I mean, not scientifically, I can't tell you how, but I think there is a way because there's always other things that can be done."(DMS_F_4).

Many of the students who think about pollution at this level believe that there is a way that we can have both clean air and industry. Without challenging industry, they believe that through modern technology (usually air filters and recycling of chemicals) and through cooperation among people, we can clean up industries or at least greatly reduce pollution. Unlike the students who think about pollution at the level to be discussed hereafter, they do not question the environmental ethics of industry or the way consumers' behavior creates a demand for certain products. Nor do they propose alternatives to technological solutions.

The students at both this level and the level discussed earlier have a tendency to perceive environmental problems as technical problems that to a large degree are externally determined. The solutions are of a predominantly physical nature -- literally; help clean up (level I) -- or of a predominantly technological nature (level II). The students' perceptions of environmental problems and pollution described thus far do not recognize the cultural and political dimensions of these issues. Environmental problems are not seen as the result of decisions we make based upon the values we ascribe to as a culture. Jette Bondergaard, who interviewed children in Denmark about their perceptions of environmental issues, discovered a similar way of thinking: "...[the children perceived factories as ruled by laws of nature. Industrial progress itself was seen as determined by nature. Even if mankind was to begin once more from the stone-age, we would end up in exactly the same polluted and unjust society as today." (Bondergaard, 1991; 6).

In the next section I will move on to a third level of thinking about pollution and environmental issues which appears to be more global, more integrated and more politicized, and which recognizes environmental problems as problems that lie within ourselves as a species.

5.7. Level III: Pollution as a Politicized Problem

From the interview analysis there emerged a third level of thinking about pollution that could be found among only a few students from all four schools. This third level could be called the most sophisticated level in that the students allude to the fact that pollution and environmental issues involve peoples' values and the choices they make. Environmental problems are basically politicized problems and problems of human nature in the eyes of these students. Pollution is often invisible and can spread out. Population growth is viewed as a major problem and the students seem to have a better understanding of global environmental issues. In addition, several students display a sense of history and are able to see today's state of the world as an extension of the past. The solutions to environmental problems cannot solely be found in picking up litter or in technology alone, but require a change in lifestyle and/or a rethinking of the basic structure of our society and/or sending a message to industry by being critical of the things we buy and consume.

5.7.1. Global Environmental Problems

When discussing specific global environmental problems, the students display a better understanding of the processes involved and the way people contribute to them. Rather than lumping all air pollution together as smoke that can affect plants, trees and animals, the students realize that there are different kinds of smoke with different chemicals, each having different effects on the environment.

Arjen: "Do you think that this [smoke in the oil refinery picture] will affect the ozone layer we talked about earlier?"
David: "I don't know about the ozone layer, I don't know whether the chemicals coming out there destroy the ozone layer, but it does make for pollution and carbon-dioxide. I don't know how to pronounce it."(SDCD_M_4).

Arjen: "Oh, okay, why is [using spray cans] bad?"
Peter: "Because it puts out carbo fluorides or something and that's just really bad for the ozone layer. It makes a hole in it and then we get poisoning from the

sun; skin poisoning, I remember. So I don't use any sprays, I use stuff you pump and squeeze and shoots it, but I don't use that stuff. And I go ride my bike somewhere instead of getting a ride.(DMS_M_2)

Arjen: Sandra just told me that spray can and bug repellants cause a hole in the ozone layer which she tells me is dangerous. "Why is it bad a big hole?"

Sandra: "One reason is the sun rays. The sun rays affect us differently when there's not a protective shield around the earth. And that's the only reason I know."(SDCD_F_2).

The above excerpts illustrate that these students have a better sense of causes and effects and are able to talk about ozone depletion without confusing them with rain forest destruction and global warming. The students also come up with concrete examples of reducing ozone depletion, although one could argue that their examples (using pumps instead of spray cans and biking rather than taking the car) do not affect the hole in the ozone layer. The students display similar knowledge and understanding when talking about global warming, acid rain and the cutting down of the rain forests. The students who think about environmental problems at this level also make refer to another global issue that they regard to be a major threat to life on earth: population growth.

Roger: "I think that over-population is one of the biggest problems 'cause that will lead to pollution and in the end to the death of everyone and it will lead to plants and animals being extinct and .... lots of problems and lots of poverty and starvation."

Arjen: "Does that [over population in developing nations] concern you? 'Cause you're so far away from it..."

Roger: "Yeah, it does concern me 'cause if, for example, Brazil or a country like that, they have major over-population and poverty, and they're still cutting down the rain-forests for land, for fertile land and that will: A. It pollutes when they start burning it; there's less medicine resources; less oxygen recycling, and, also, in places for every person there is a lot of pollution and also, for example, if a lot of developing countries... other countries have to send aid to them or they're supposed to (....) the more people there are the less there is for everyone."(DMS_M_7).

Arjen: "Why do you think there's over-population? Any idea?"

Rob: "Because... in the U.S. some people are really worried about it, but in other countries, like where the diseases are so high, they've ten kids and eight of them survive, but still they're quadrupling their own population going from four to eight, I mean from two to eight. In some places in Europe, like in Norway, they have zero population growth which is; most people, for every

family they have two kids so that when the parents die they leave two kids behind to take their place. So they've zero population growth."

Arjen: "Do you think that would be good to have?"

Rob: "Aha... Like in Mexico, there are things like population pyramids, and for people ages eighty five and up, they've like a little section, 'cause their population isn't as high, and then for every age group down there're more and more people, and it just gets out to like 10 million kids and that's like way too many because the world only has limited space and we can only use like 15% of the earth's surface for room. I mean 'cause most people can't live on the water and you can't live on like the Arctic and the Antarctica and those places and there's just some places where people can't live cause their's no arable land. I mean you can't grow your own food and you can't... I mean, it's too cold. Like people haven't adapted to that kind of cold."(DMS_M_8).

In addition to knowing and understanding global environmental issues, Roger and Rob display a sense of connectedness when they talk about population growth and its causes and effects. Connectedness in the sense that they are able to see connections between global environmental issues, are able to extrapolate the present to the future and are able to see the earth as a world community. In the students answers there also are things missing in that they do not consider the colonial past or modern imperialism critically in their analysis of over-population. Nor do the students consider unequal distribution of wealth and resources as possible contributors to global environmental problems. Yet, they do seem to acknowledge that environmental problems are basically problems of human making. Carol alludes to this:

Arjen: "You just said that sometime there'll be the end of the world: What do think will make the world end?"

Carol: "People I think, people and the way, you know, some day the world is gonna be too over populated and there's just not gonna be enough room. And like the African-American plaque and that you know. There's gonna be more things like that and like cancer, we may never get a cure for that and there's just a series of things that, you know, that could happen. There's a lot of theories."

Arjen: "Could people behave differently so that we could have less pollution?"

Carol: "Well, like I said, like recycling, but we have to get, we have to get, somehow we have to get more people interested in this. Interested in community service and doing it not for money, like people saying, you know, money makes the world go round, but we have to understand that if we still wanna have children and if we want them to have a life like we do, we have to have everybody understand that if they want to have a life at all, that we're gonna somehow have to get people to understand that we can't pollute and always do this. 'Cause some day, you know, there's not gonna be a world anymore."(DMS_F_3).

People, in Carol's eyes, are themselves responsible for their actions which, if not modified soon, will lead the end of the world. She also questions the influence money has in the shaping of the world. Other students allude to this when discussing the role of industry in polluting and cleaning up the environment. Carol talks about the world as a whole, interdependent unit. In talking about how actions might lead to the end of the world, she also considers the kind of planet we leave behind for our children.

Perhaps as a result of their knowledge and understanding of global environmental issues, their sense of connectedness and their perception that environmental problems are problems of human making, the students at this level are more creative in presenting solutions to these issues. Even when focusing on technical solutions, they seem to have innovative and rather detailed ideas:

Arjen: [Peter talks about the pollution caused by cars.] "Don't you think they'll invent something else a car could run on?"

Peter: "Something that you.... like in your back yard, you have a big panel and you hook your car up to it and it's been storing energy all day, then you come home and you plug your car to it. It takes that energy into the car and then it (keeps on taking it). In order to get that sort of energy you got to stop making cars and making gasoline so it doesn't fog up the sky. So we can get sun light." "You're boxing yourself in with cars, so you won't be able to make solar energy."(DMS_M_2).

Peter envisions solar panels that charge up a battery during the day which then is plugged into your electric car at night. This way you won't need fossil fuels and you won't cause air pollution. However, Peter is afraid that this bright idea won't work if we continue to "fog up" the sky with our current air pollution. Air pollution will reduce the amount of sun light reaching the earth and thus reduce our capacity to utilize solar energy.

In addition to innovative technical solutions, these students also provide alternative lifestyles and legislative measures as solutions to pollution. Roger proposes better public transportation as an alternative to cars:

Roger: "..... I don't know what the community would be like if it was different, but I think it would be a lot better off if there was public transportation like trains or buses or subways riding everywhere."
Arjen: "Why would that be better?"
Roger: "... Less pollution, less traffic and well that might be just because I grew up in Switzerland and that's the way it was there. It might be that I'm just biased a bit..."(DMS_M_7).

Tanya thinks that people should use their power as consumers. By being critical of what you buy, you can send manufacturers a message that will prompt them to change their product line or go out of business, she seems to say:

Tanya: "I know that the plants that make cars and the oil and everything, they have the smoke pipes and it's going into the air. But yet the people who [are] still buying these cars are the main ones that's talking about the pollution. If you want to do something about it, stop buying it! If you stop buying it, they'll stop making them and then there will be no pollution."(HMS_F_2).

Tanya seems to be sensitive to the hypocrisy that surrounds the notion of being "an environmentalist" when she suggests that the people who complain about pollution are the same people buying cars.

When discussing the garbage issue the students who think at this level do not think that the garbagemen solve the garbage problem, nor do they think that landfills or incinerators take care of the problem. Instead they are concerned about the lack of recycling and the production of environmentally unsound packaging:

Arjen: "Where do they take [the garbage you put on the street] you think?"
Latoyah: "There's a trash dump near Simmons and they may take it to that incinerator, I'm not sure."
Arjen: "Do you think that all the garbage people are throwing away is a problem?"
Latoyah: "Yes, because some of it can be recycled, like styrofoam and glass bottles and jars and stuff."
Arjen: "Do you do any of that?"
Latoyah: "Well, we save most of the jars and bottles and stuff. The glass and pop bottles we take back to the store." (HMS_F_5).

Arjen: "Is there a way to reduce waste?"
Rob: "I think that you can sort of send it into space, like get it out sort of far, like dump it onto a planet that has no, ... as far as we know none of the other planets have life on them. Just find a planet other than Mars and put it on

there. 'Cause Mars I've heard that there, they've found traces of ice on Mars, like at the North and South ends. And, you know, people are talking about there being things on Mars, and I don't know if that's possible, but I don't wanna ruin any chances that we might have by dumping waste on there. So you should put it like somewhere else."

".....I don't see why people have to make plastic containers and things like that. Plastic is good for some things, but after a while it gets too much. I mean those styrofoam cartons take a couple of years to brake down and if you put it in those plastic garbage bags, like those black ones that you used to put all your lawn clippings in... If you put it in bio-degradable bag, you can feel it's starting to decompose, if you set it outside and you feel like the bottom it's warm and hot 'cause it's starting to decompose. And I think that decomposing the things is a lot better. Like we should make things out of more paper 'cause I know wood decomposes."(DMS_M_8).

Arjen: "What happens to the garbage in your home? Where is it going? How does it affect the environment?"

Carry: "I think it keeps getting dumped places and in junk yards and, you know, I try to recycle things, newspapers, plastic cartons. And we try not to waste cartons and paper and things." "A lot of people say think that paper [makes up a lot of the garbage], but I saw a news report that said that it's plastic [that makes up the bulk]. So I don't know what to do because I look what I put in the garbage and you say: 'can't they recycle this?' But if you go to McDonald's and get those things, I don't really know where to recycle them, I don't know." [a bit desperate] (DMS_F_4).

When discussing the photograph with the oil refineries, students seem to be more aware of apparent contradictions between the interests of industry and having a quality environment. Some of the students think that although industry is necessary in a modern society, there is no form of ethical control to prevent them from polluting. Industry should be controlled by legislation, and the things we buy and do not buy.

Arjen: "Do you think there's a way we can have both industry and clean air?"

Carol: "It depends, if we all, if we don't have factories like this, we have industries in our home. Kind of more like farming. And if we don't wanna have cars and we could, you know, travel by horse and buggy, you know, it's gonna kind of reflect on a long time ago and we're gonna have to think more about, you know, it's gonna be more technology that we have to think about and not just think, you know, we wanna have cars move 900 miles per hour 'cause that's gonna be more pollution and it's gonna be more money. So we have to think about may be to have more old fashioned ways, you know, now!!"

Carol suggests that we live in an industrial society that exists as a result of our desire to have a modern lifestyle with modern conveniences. She

recognizes that there is a price to pay for this lifestyle in the form of a polluted world. She also realizes that there was a time in which people lived without modern conveniences in a more sustainable society in which people to a large degree were self-supporting. She suggests that in order to be able to find a more environmentally sound lifestyle, we may need to consider the reinstallation of old fashioned ways that were less polluting. She seems to say that the choice is ours to make: do we want a modern society with cars that drive 900 miles an hour, that will be heavily polluted, or do we want a less modern society without some of the conveniences we have become accustomed to, that knows little pollution?

Rob also questions our lifestyle, which in his eyes is sometimes excessive and wasteful. But he also questions the environmental ethics of industry. He thinks that industry's concerns lie with making a profit and not with preventing pollution. Even when corporations express concern for the environment, their words are not met by their actions, Rob suggests. He seems to favor stricter legislation to curb pollution.

Arjen: "Do we need industry?"
Rob: "For some things, yes, but there are a whole lot of things that are industrialized that don't need to be."
Arjen: "Like what?"
Rob: "Like little toys. I mean, kids don't need to have as many toys as they do. I know it's fun, but... And there're some like pleasures that people make... I mean it's normal for a family to have like three or four TVs in the house where a long time ago -- not a long time ago, but a couple of years ago -- it was nice to have one. But now, you know, if you only have one you feel like... I mean, I know in our family we have... six. I have one in my room, one in my younger sister's room who's five... They've one in my older sister's who is sixteen. We have two family rooms; one in each of those and one in the kitchen. That's a lot of TVs and I don't think we need as many as we have, but it's nice to have them."
Arjen: "Do you think we can have both industry and clean air, somehow?"
Rob: "Somehow.. I've learned of some filters that can be put on smokestacks that companies don't have enough money [to buy]. And it's not like a law, so it's just like, you know, "Well if you wanna stop pollution then you can have one of these, but it's gonna cost you a lot!" And for some companies, they don't care about the environment and if they do, they don't show it by their actions."(DMS_M_8).

The students who think at this level about environmental issues and pollution have for various reasons (media, parents, personal experiences and concerns) developed an understanding that makes it possible for them to see

environmental problems to a large degree as problems of human nature. The students are able to talk intelligently about a variety of specific global environmental issues and realize that these problems transcend national boundaries and are influenced by our own actions. Perhaps illustrative of their sense of connectedness is their recognition of population growth as the umbrella of environmental issues. Solutions to environmental problems are found in a combination of new technology to prevent and clean up waste, personal lifestyle changes, environmental legislation and critical consumerism.

I should note that even though I suggest a hierarchy in levels of understanding, the boundaries between these levels are fuzzy, and one and the same student can operate at different levels depending on the context of the discussion. The third level is by no means the highest level of understanding environmental issues. There is at least one other level at which people seek a new world order that is built upon human equality and the sustainable sharing of natural resources on a global scale, while recognizing that there are limits to growth.

5.8. Summary and Conclusions

Talking with thirty seventh-graders from the two Detroit schools and the schools from Barnsley and Forest Grove about pollution and environmental problems revealed that within the same age group students think very differently about these issues. Roughly three distinct ways of thinking about pollution and environmental problems emerged.

I. *The personalistic view*

Pollution can be touched, smelled, tasted and seen. Once it can no longer be sensed, pollution is no longer a threat to our health. People contribute to pollution directly when they litter, put garbage in the garbage can without closing the lid properly, when they do not keep up their lawn -- even when they cough without putting their hand in front of their mouth. Pollution is mostly a local problem and does not have the ability to spread out

to far away places. Out-of-sight is out-of-mind, in the eyes of these students. The effects of pollution are immediate upon impact and are mostly a concern for humans and not for other animals or plants.

Environmental problems are mostly physical problems that are a direct result of our own individual polluting behavior which is subject to our own individual control. Environmental problems are not viewed as problems of human nature or as cultural problems. Solutions to pollution are found in changing our own "polluting behavior" (e.g. stop littering) and helping "clean up" polluted areas (e.g. pick up litter).

II. *The technocratic view*

Pollution cannot always be detected by our senses for it can be present without being noticed. Pollution can spread to far-away places via water and air, and poses a threat to humans and other species on a global scale. Pollution accumulates overtime and does not disappear when it is out of sight. There are many indirect ways, e.g. using electricity, in which people contribute to pollution. Pollution is an inevitable result of the way we live. Students are able to talk about specific global environmental problems such as acid rain, ozone depletion, and global warming, but have only a fragmented understanding of these issues which makes it difficult for them to distinguish them from one another. While talking about these global issues, students use words such as habitat, ecosystem, carbon-dioxide, "fluoro-carbons," and biodegradation, without comprehending their meaning. Students seem to think that environmental issues have the potential to destroy all life on earth. Industry symbolizes an inevitable evil: the price we pay for our modern lifestyles. By developing new technologies that filter pollution from water and air, it may be possible to have both industry and a clean environment. Students do not challenge the presence of industry or our lifestyles, and emphasize cooperation between people along with technological solutions as the proper responses to addressing environmental problems. Environmental problems are not seen as problems of human nature or as cultural problems. Nevertheless, they appear to have a broader notion of pollution and their expressions of their concerns is more coherent or less disparate.

III. *The politicized view*

Pollution manifests itself in many visible and non-visible forms and does so on a global scale. Students see environmental issues as global issues and link pollution problems to rapid population growth. When discussing global environmental problems, students display a coherent understanding of problems such as acid rain, ozone depletion and global warming, and are able to distinguish them from each other. Students are able to see current pollution problems in a historical context as products of the evolution of rural and tribal forms of living toward the modern society we live in today. It is suggested that earlier societies did not have pollution problems. Pollution is seen as the result of our modern industrial society that people themselves have shaped by their decisions, actions and values.

Students see environmental problems not as natural occurring phenomena without any possible form of ethical control, nor as mainly technological problems, but instead as politicized problems: problems of conflicting interests, choices and values. They suggest that in addition to exploring new technologies, we change our lifestyles to accommodate reducing, re-using and recycling. They hint at the idea of "limits to growth" when suggesting that we should show constraint in taking advantage of the perks of a modern society. Students also suggest that the interests of industrialists contradict environmental interests. Environmental issues become political issues. People can send a message to industry by boycotting polluting products. Students do not consider the colonial past or modern imperialism in their analysis of overpopulation, nor do they consider the unequal distribution of wealth and natural resources as possible contributors to global environmental problems.

These three perspectives of pollution and environmental issues (see Table 5.1) can be found in all four schools with the technocratic view point being the most frequent one, followed in descending order by the personalistic view and the politicized view. Some students adhere to different perspectives depending on the topic of discussion. There is a

hierarchy in the three perspectives. As one moves from the personalistic perspective to the politicized perspective, students' level of knowledge and understanding becomes more sophisticated, the pieces of information are less disparate, their thinking becomes more holistic; they become more able to see local issues as the local manifestations of global problems, and finally, their ability to see environmental problems as problems that lie within ourselves increases. Again, all three perspectives can be found in all four schools, but the personalistic perspective is more prevalent in the two Detroit schools whereas the politicized perspective is more prevalent in the Forest Grove and Barnsley schools. The technocratic perspective is dominant in all schools.

I can imagine that there are other perspectives on pollution and environmental issues. These other perspectives could, for instance, include a critical perspective that challenges the distribution of wealth and natural resources worldwide and the principles of capitalism or a perspective that does not regard pollution or environmental issues as problematic at all or a fatalistic-deterministic perspective that suggests that humans are destined to pollute and destroy the earth as part of an evolutionary process or as a punishment by a higher being for our sins. I did not find these kinds of perspectives among the students.

Within groups of seventh graders it is possible to find several perspectives that can be clearly distinguished. Unlike other studies suggest, it does not seem to be the case that there is one coherent view that comes with a certain age or grade level (Rejeski, 1982; Brody, 1991). This finding, along with the variety of alternative conceptions of pollution and environmental issues that can be found among students, should have implications for environmental education and its attempts to build upon what students already know or think. These implications will be discussed in the next chapter. Table 5.1., on the next page, illustrates the three ways of looking at pollution and environmental issues that emerged from the interviews.

Table 5.1 Young Adolescents' (12-13) Perceptions of Pollution and Environmental Issues

	LEVEL I: Personalistic View	LEVEL II: Technocratic View	LEVEL III: Politicized View
Qualities Attributed to Pollution	Pollution has apparent physical qualities: it can be seen, smelled, touched and tasted. If it cannot be sensed in any way then pollution is not present and therefore not a problem. Students only identify point-source pollution. Environmental problems are physical problems.	Pollution can also be present and pose a health threat when it cannot be sensed. Pollution can move around through rivers, water and soil, and can accumulate. Students only refer to point-source pollution, including cars. Environmental problems are technical problems.	Pollution manifests itself in many visible and non-visible forms on a global scale. Pollution is seen as a cancer that keeps growing out of control. Students recognize both point and non-point pollution. Environmental problems are problems of human nature and the choices people make.
Perceived Causes	People create waste as a by-product of their existence, but they have no place to put it so they just dump it in a river or throw it on the ground. Some examples: not closing the lid on the garbage can, coughing without covering your mouth, using a barbecue and not keeping up the lawn.	Pollution is the result of people's individual "polluting" behavior (driving a car, generating garbage and littering) and the by product of industrial processes (air and water pollution). Students display knowledge of indirect causes of pollution: e.g. using electricity.	A combination of rapid population growth and the price we pay for the transition from a rural/tribal society to a modern industrialized society. In essence pollution is the result of our own decisions, values and actions. A conflict of interest between economy and a clean environment.
Perceived Effects	People and, to a lesser degree, animals will get sick when they have direct contact with pollutants: e.g. breathing in thick smoke and drinking "dirty" water. Effects are acute and immediate. Polluted areas can be unsafe areas to visit; the people who hang out there can be dangerous. Students have little or know under-standing of concepts such as; "bio-degradable," "ecosystem," and "global environmental issues."	Eventually we will have no place to put our garbage. Chemicals can kill people, animals and trees. Smoke and chemicals in the air can lead to a hole in the ozone layer, the greenhouse effect and acid rain. No clear understanding of how these issues related or what they mean other than that they are all bad. Students have heard of concepts like "habitat," "ecosystem," and "bio-degradable," but don't really know what they mean.	No more landfill space to put our garbage which will lead to more incineration which pollutes the air. Global environmental problems such as; acid rain, atmospheric greenhouse effects, rainforest destruction, and the hole in the Ozone layer. Students display a coherent understanding of these issues and are able to distinguish them, Effects can also be chronic. Students have some understand-ing of complex concepts such as "ecosystem" and biodegradable."
Perceived Solutions	Pollution can be avoided since it is a physical problem over which we have control: stop throwing things on the ground, help "clean up," keep your own yard clean, close the garbage can, burry waste in a landfill and cover it to avoid the smell and the rats. Use smokestacks to get smoke out of the factories, away from people.	Pollution is inevitable, but can be limited by being less wasteful, recycling more, planting lots of trees to counter air pollution, and using technology, e.g. filters to clean water and air, incineration to burn waste. People need to cooperate in countering pollution.	Pollution is inevitable but can be curbed by taking technological measures, such as using alternative energy and fuel efficient cars, using legislation to curb industrial pollution, changing personal behavior, e.g. recycling and boycotting certain products, and, finally, changing our lifestyle, e.g. using public transportation.

CHAPTER VI

INTEGRATION AND DISCUSSION OF FINDINGS: A CONSTRUCTIVIST PERSPECTIVE

6.1. Introduction

In an attempt to integrate and highlight some implicit and ad-hoc implications of this study for environmental education practice, I will now pull together some of the findings using a constructivist perspective on teaching and learning. In Chapter I, Problem Statement and Research Approach, I recognized the importance of confronting research findings with relevant theories of learning. In this final chapter I will do so by bringing back constructivist theories of learning. I will argue that, depending on the interpretation of these theories, constructivist approaches of learning can provide a useful, non-prescriptive, holistic and dynamic framework for environmental education programs that intend to build upon the knowledge, ideas and perspectives students bring to the classroom as a result of their own prior experiences. In describing and occasionally modifying constructivist learning theory, I will repeatedly draw upon earlier chapters. This chapter culminates in a constructivist model for curriculum development in environmental education, a proposed teaching and learning sequence, and list of concrete recommendations on the role of students' nature experiences and perspectives on environmental issues in environmental education for urban middle school settings.

6.2. Constructivist Approaches of Learning in Environmental Education

In describing constructivist approaches of learning and their relationship to environmental education in view of this study, I will take a dual perspective: that of an environmental educator in the role described in Chapter I, and that of somebody who views learning as conceptual change. The latter perspective needs clarification. Learning as a process of conceptual change has its roots in Max Weber's *Verstehen* tradition which stresses the importance of meaning as constructed by individuals in their attempt to make sense of the world (Weber, 1949). Within this tradition students' making sense of any event is dependent upon both the situation they find themselves in, their purposes, intentions and active constructions of meaning. Their intentions, purposes, and interpretation of (new) phenomena to a large degree depends on their prior experiences. Similar to Magoon's description of the role of a researcher operating within the Verstehen tradition, the student is in a position much like a member of the audience in a play. He attempts to pull together hints, consistencies and patterns in order to answer the question: what did the actress mean by that? (Magoon, 1977).

In rather mechanistic and instrumental terms, some constructivists view learning as the process that leads students to integrate or subsume a new piece of information into an existing cognitive structure (Ausubel, 1968; Novak, 1978; Novak and Gowin, 1984). Parallel to Kuhn's scientific revolution, the learner will use existing concepts to deal with new phenomena until these phenomena appear to be inadequate to allow her to grasp a new experience or phenomenon successfully (Posner et al, 1982). This position differs from that of philosophers who place central emphasis on the research methodology used by empirical analytical scientists. Popper, for instance, minimizes the conceptual framework of the scientists (and students) and stresses instead the scientist's methods of analysis, as if they are independent of interpretations (Popper, 1959).

If learning is viewed as *conceptual* change, then a closer look at the word *concept* is needed. This is particularly appropriate given that within constructivist approaches of learning there are different notions of "concept." On the one extreme there is the *classical* view of concept which is much in line with the more mechanistic and instrumental traditions in theories of learning, criticized earlier in this dissertation (Chapter I). On the other extreme there is the *actional* view of concept which appears to be congruent with the Verstehen tradition and epistemology of the inquiry model followed in this dissertation. I will briefly describe both views (for a more detailed description see Gilbert and Watts, 1983).

The *Classical* View of Concept

In the classical view of concept all instances of a concept share common properties which are necessary and sufficient to define the concept. Knowledge is stored in the mind in hierarchical layers which can be decomposed into smaller parts and studied independently. The acquisition of knowledge can also be decomposed into elementary steps that can be represented by hierarchical decision trees, so that progress in knowledge is dependent on whether the previous step is mastered in its totality (Gilbert and Watts, 1983; 66). Public and private knowledge are seen as isomorphic and by implication are part of a static, logical and organized system.

This view of "concept" gives rise to the notion of *misconceptions* or *flaws in the system.* According to Gilbert and Watts the program of detecting and illuminating misconceptions can be seen as an initial step in an effort to isolate, eliminate, repair or restore the failures in the analytical framework in order to continue accretion on "solid foundations." Although under some scrutiny, the classical view of concept and the theory of learning that can be associated with it is widely used in many schools (e.g. Novak and Gowin, 1984).

The *Actional* View of Concept

The actional view of concept regards concepts to be active, constructive and intentional. Freyberg and Osborne present concepts as ways of organizing our experiences so that new experiences do not leave concepts intact, but that

all cognitive learning involves some degree of reconceptualizing our existing knowledge (Freyberg and Osborne, 1981). Conceptual development is seen as a continuous, active, creative process of differentiation and integration of local conceptual domains (Kelly, 1963). Rather than than a search for invariants (or universals) in either conceptual content or development, educational research -- which within this framework is viewed as part of the task of the teacher -- becomes the "mapping" of the "topography" of local domains of understanding or mini-theories, and the charting of changes in frames of reference so that the durability, stability, coherence and consistency of conceptual constructions become the point of departure (Gilbert and Watts, 1983; Claxton, 1982).

One crucial aspect of the actional view of concept is the high epistemological status accorded to an individual's personal conception. For instance, the phrase *children's science,* attributes to children's views the status that society frequently gives to science (Gilbert, Osborne and Fensham, 1982). Consequently, advocates of this view are highly supportive of valuing and respecting personal meanings in order to enhance learning. Interestingly enough, within the actional view of concepts, there are no mis-conceptions. Students' "errors" or "flaws" are now recognized as being natural developmental phenomena or at least personally viable constructive alternatives, rather than the result of some cognitive deficiency, inadequate learning, "carelessness," or poor teaching (Gilbert and Watts, 1983). This outlook supports Kelly's theoretical position that it is an essential, unavoidable and desirable feature of personal experience that individuals generate their own conceptions for phenomena (Kelly, 1955).

The high epistemological status given to students' perceptions of nature and environmental issues in this study and the choice of a phenomenologically oriented research approach to study children's ideas reveal that I favor the actional view of concept over the classical view of concept. With the actional view of concept in mind, a goal of environmental education research could be to develop a theory of conceptual change that will lead to a teaching and learning sequence that starts with the students' ideas regarding nature and environmental issues, and ends with students'

understanding of environmental concepts such as pollution, conservation, "reduce, reuse, recycle," interdependency, limits to growth and so forth.

If we consider learning to be the process of conceptual change as a result of having a new experience or facing a new phenomenon, then what factors need to be considered in facilitating learning? Leaving aside the technicalities of how somebody's "cognitive structure" changes[1] I will focus on the more useful *conditions* that facilitate conceptual change. Posner and his colleagues distinguish four important conditions which facilitate learning. The conditions come from Posner et al, 1982; 214. The examples have been derived from Chapter V of this study:

1) There must be dissatisfaction with existing conceptions. People are unlikely to make major changes in their concepts until they believe that less radical changes will not work.

Example: Some middle school students see the hole in the ozone layer as a physical hole that needs to be "patched" up otherwise too much sunlight will reach the earth which will lead to global warming. This explanation makes perfect sense to them, even though it is not the hole in ozone layer that causes global warming. An understanding of the greenhouse effect and the role of the ozone layer in filtering out cancer-causing and crop-damaging uv-radiation -- much like a pair of sun glasses -- may lead to a rethinking of the relationship between the hole in the ozone layer and global warming.

2) A new conception must be intelligible. The learner must be able to grasp how experience can be structured by a new concept sufficiently to explore the possibilities inherent in it.

Example: Several middle school students view acid rain as acidic rain that damages people's cars and messes up people's hair. Again, an explanation that appears to work well for them in explaining why acid rain is bad and why many cars rust. When confronted with car exhaust as a mixture of chemicals

[1] Rumelhart and Norman (1981) mechanistically distinguish three processes that can lead to conceptual change; accretion of "parts" to an existing structure, tuning of the existing structure to accommodate the new experience and restructuring of existing knowledge.

that rises up in the air where it can mix into the rain, students may rethink the causal relationship they had created earlier and may come to see that acid rain can damage trees as well.

3) A new conception must appear initially plausible. Any new concepts must at least appear to have the capacity to solve the problems generated by its predecessors.

Example: Several middle school students only regard garbage to be a problem when it is not picked up by the garbageman or when the lid on the container is not closed: it looks messy, stinks and will attract rodents. This view of garbage does explain why garbage can be an immediate personal problem, but does not explain why people are urged to reduce, reuse or recycle. Once confronted with overloaded landfills and the environmental impact of landfills, these students may develop a new theory of garbage that includes problems of disposal, consumption, accumulation and runoff.

4) A new concept should suggest the possibility of a fruitful research program. A new concept should have the potential to be extended, to open up new areas of inquiry.

Example: Several middle school students do not "see" smog or diluted smoke from exhaust pipes or smokestacks as a problem. By introducing them to the concepts of toxins and non-visible, delayed-impact pollutants, they may not only come to see the "smog" phenomenon in a new light, but also have the potential to transfer new concepts to other realms of experience such as fish death in seemingly clear rivers or the longterm dangers of smoking. Along the same line, students could be introduced to the concept of "concentration." To understand the meaning of ten parts per billion will likely alter their concept of chemical pollution.

Obviously, there is more to facilitating conceptual change than taking into account the four conditions described above. There are a variety of psychological processes and conditions that stem from the learners' milieu and affect conceptual change. From this study, it can be concluded that children acquire considerable knowledge about nature and environmental

issues from their everyday interactions with their social and physical milieu, as well as from the information they are exposed to in and outside school. Earlier I suggested that people, including children, do not have isolated ideas, but rather ideas that make up parts of a world view which provides a sensible, more-or-less coherent understanding of the world from the individual's point of view. If certain ideas are embedded in a sensible and coherent world view, then it is no surprise that these ideas can be tenacious and resistant to change (Ausubel, 1968). Several researchers suggest that students develop "assimilative strategies" that allow them to hold on to their own conceptions, for instance by:

- Looking for confirming rather than opposing evidence to validate one's own interpretation of reality (e.g. Snyder and Swann, 1978; Linn and Swiney, 1981)
- Refusing or denying alternative interpretations. Lord and colleagues showed that people who read two studies, one supporting their critical position and one opposing it, accepted the supporting data at face value while they critically examined the opposing study (Lord et al, 1979).
- Considering the anomaly as an exception to the rule and remembering it as such (Hasweh, 1986).
- Using ad-hoc explanations and rationalizations (Hasweh, 1986).

Ironically, schools appear to help students in their attempts to hold on to their own interpretations and explanations, thereby in effect blocking conceptual change. Examples are not hard to find. Teachers are often unaware of students' (pre)conceptions of certain topics (e.g. Tasker, 1981; Anderson and Smith, 1983). Evaluation methods, such as standardized tests and examination questions, do not capture preconceptions or assimilation of new knowledge into existing conceptions. This is indicated by studies which show that students pass courses with good grades yet retain their preconceptions in spite of teaching. Most tests reveal whether the required answer is provided or not, but fail to examine the conceptions held that can explain "wrong" answers (Hasweh, 1986). Furthermore, preconceptions are not addressed even when revealed by students' answers. Teachers are not always critical of answers revealing preconceptions (Anderson and Smith, 1983).

In addition to these classroom-related factors, there are factors in the larger environment that help the persistence of ways of looking at the world. Some of these come from the existence of explicit cultural beliefs. To repeat an example used in Chapter V: the western view of "waste" as something worthless without monetary value contradicts the view of some other cultures that view waste as something that cannot be used again. This distinction obviously affects the amount of waste generated by a society. Another factor that contributes to persistence is the everyday language people use to describe phenomena which sometimes subtly affects our ideas, beliefs and understanding. Words such as garbage, trash, dirt and rubbish have negative connotations favoring "to get rid of" over to "make use of." A third factor distinguished by Hasweh is the persistence of common sense epistemology in culture as a whole (Hasweh, 1986). Examples hereof include the western inclination to define quality of life in terms of material wealth, or its faith in technology and cybernetics in resolving environmental issues. Many of the twelve- and thirteen-year-olds interviewed in this study already appear to have much faith in technological solutions to environmental problems.

Having discussed some factors that can help us understand students' formations of potentially tenacious views on environmental issues, and some factors that can block conceptual change, I will now shift focus towards creating conditions that can facilitate conceptual change in the classroom. Claxton, in acknowledging the strongly individual character of constructing meaning, suggests that conceptual change can be potentially threatening to the individual and that restructuring conceptions requires a supportive environment where individuals' ideas are valued (Claxton, 1982). Similar advice is given by educators who advocate action research approaches to curriculum development and classroom practice (Di Chiro and Stapp, 1985; Carr, 1986).

In addition to creating a positive classroom atmosphere, the role of experience and the relationship between the purpose of learning and the products of "intellectual activities" need to be considered. If it is true that we are always using knowledge that has already been acquired through previous

experience, then schools should create experiences where they appear to be lacking (see also Dewey, 1963). Hasweh suggests that creating new experiences only can lead to conceptual change if the learner sees the relevance of the experience in achieving a certain aim (Hasweh, 1986). Teachers and students may have to examine to what degree they share common purposes. If, for instance, students feel unsafe when visiting a dense forest, and are concerned about who might be hiding behind the trees, then a discussion of growth patterns of an oak tree may be irrelevant to them. The aim of the teacher may be to teach about the circular growth rings and how they can reveal climate changes of many years ago, while the students' aim may be to get out of the forest safely. Students' perceptions of nature as a threatening place will need to be elicited and addressed by the teacher, before the students can come to share the teachers aim. Another condition for sharing the aim of the teacher, would be for the students to see the relevance of looking at growth rings. This can be done by making a connection with global warming, which is a concern many students have.

A phenomenon repeatedly reported in some literatures is that of students' resourcefulness in developing knowledge schemes and strategies which help them succeed in school, that is, help them in passing recall tests (Anderson, 1977; Everhart, 1983). Anderson notes that it is the evaluative structure used to assess students' knowledge which encourages them to compartmentalize school knowledge and keep it separate from preconceptions used in their daily lives. The interviews used in this study to a degree confirm that there were some students who, at least in the beginning of the interview, were playing the school game of trying to give the "correct" answer to "pass" the interview, but also that the often coherent views and perceptions of nature and environmental issues which eventually emerged in all interviews, appeared to be separate from school knowledge.

Besides creating a positive and supportive classroom atmosphere, creating experiences where there appear to be a hiatus of experience, examining and streamlining the purposes of teacher and students and their relation to the learning activities, the role of conflict in conceptual change needs to be addressed. Many educational theorists suggest that conflict is crucial for learning: that is, conflict between existing "interpretive structures"

acquired as a result of past experiences and a new phenomenon that cannot be explained or understood with this existing structure. The theory suggests that once a learner recognizes that his current interpretation of certain phenomena does not help him understand a new phenomenon, then this will lead to a state of dissatisfaction. When this feeling is strong enough, then Piaget speaks of a psychological state of *disequilibrium* (in the context of cognitive development) (Piaget, 1964), Festinger speaks of *cognitive dissonance* (in the context of attitudes and beliefs) (Festinger, 1957), while Berlyne speaks of *conceptual conflict* (in the context of teaching) (Berlyne, 1965).

In several theories of learning, including constructivist ones, it is suggested that inducing so-called cognitive dissonance will increase students' interest in learning which will ultimately accommodate conceptual change. In a sense, conceptual change can be interpreted as a dialectical process aimed towards resolving a learner's initial inability to grasp or make sense of a new phenomenon (e.g. a new idea, a new experience, or a new explanation). Given that, as has been confirmed by this study, within the same classroom one can find an array of different perceptions, ideas and mini-theories, it would make sense to induce conceptual conflict by allowing students to make their own conceptions explicit. Again, this would have to be done in a supportive, non-judgmental classroom environment through shared personal reflection with the teacher, the class or both. If an individual's personal ideas are not valued, then learning is more likely to be blocked (Claxton, 1984).

In the next section I will synthesize the discussion of constructivist views of learning as *actional conceptual change* with some of the findings regarding students' conceptions of nature and environmental issues as they emerged from this study, by proposing a constructivist model for curriculum development in environmental education.

6.3. A Constructivist Model for Curriculum Development in Environmental Education

In a literature review of constructivist approaches of learning, I discussed a model for curriculum development that was construed by Rosalind Driver and her colleagues of the Children's Learning in Science Project, based at the University of Leeds in the United Kingdom (Wals, 1987). At the end of the review I wrote that constructivist views can make a key contribution to the development of environmental education in school settings and that research was needed to find out what kinds of preconceptions, ideas and beliefs students already have about environmental issues and what factors contribute to the persistence of environmentally unfavorable conceptions, inhibit the acquisition of new "ecological" ones, and, finally, inhibit conceptual change. Now that some answers have been provided to these research questions, I would like to revisit Driver and Oldham's model for curriculum development, but this time translated to environmental education.

Based on the constructivist actional view, a view which appears to support or complement the research approach used in this dissertation, I have arrived at a perspective of teaching and learning which takes into account the prior ideas or ascribed meanings learners have constructed to interpret their experience; acknowledges that learning involves the active construction of meaning on the part of the learner; and views learning as the re-organization of the learners' conceptions (Driver and Oldham, 1986). This perspective holds that what a learner constructs -- the meanings she makes -- depends on what she brings to the classroom as well as on the learning situations provided.

Driver and Oldham note that the curriculum within this framework is no longer seen as a body of knowledge or skills, but as the program of activities from which such knowledge or skills can be possibly acquired or constructed. This change of perspective has implications for the role of the teacher as well. The teacher is no longer viewed as the detached transmitter

of knowledge or skills who, when having a coherent grasp of the subject, is able to transmit the subject to the learner effectively. Instead, the teacher becomes a facilitator who helps students in the active construction of meaning by starting from the students' own ideas and providing opportunities for building on these ideas or, if necessary, to modify these ideas to accommodate conceptual change (Driver and Oldham, 1986).

A second difference lies in the shift of status of the curriculum from what has been determined prior to teaching (though negotiable between adults), to something with a problematic status which is relatively undefined and constantly subject to change.

The constructivist model for curriculum development as created by Driver and Oldham distinguishes four inputs: decisions on content, information about students' prior ideas, perspectives on the learning process, and teachers' practical knowledge (Driver and Oldham, 1986). These four inputs influence the design, implementation and evaluation of a curriculum. The evaluation results will affect the four inputs and the spiral continues. The model is circular in that a change in any piece of the model will affect all other parts as well. In practice the distinct phases are overlapping and do not necessarily follow the same sequence as pictured in figure three, although that sequence appears to be the most logical (Figure 6.1.).

I will discuss all four inputs and illustrate them with environmental education related examples derived from this study. The first and most conventional input consists of *decisions on content*. Decisions on content are not viewed as decisions on what textbook to use or what topic should be taught or avoided, but specifying those experiences which students should be exposed to and suggesting what ideas students may construct from these experiences without being overly prescriptive. If, for instance, a school finds it important to teach about food cycles, decomposition, photosynthesis and also would like to provide students with opportunities to experience nature, then the school (particularly a city school) may want to explore the possibility of starting school gardens around the school building where students can grow their own vegetables. Before actually implementing this idea, the teachers in consultation with other human resources in the school

community, would have to envision the kind of learning experience this may develop into for the students. In order not to be too prescriptive and to give students an opportunity to shape their own learning experiences, they too will need to be consulted about the kind of experience they would find interesting and relevant. The curriculum design further needs to be considerate of what the students think of being outside the school building, digging soil, getting dirty, planting seeds and maintaining the gardens. This brings me to the second input of Driver and Oldham's model for curriculum development: the ideas students bring to the learning situation.

Since constructivist approaches of learning consider learning to be the process of conceptual change, information is needed about the *ideas students bring to a learning situation*. This in essence requires some teacher classroom research. Through, for example, classroom round-table discussions, semi-formal conversations with students individually, open-ended questions, classroom observation (e.g. of students reactions to spiders or other classroom critters), essay writing or a combination of all of the above, in combination with talking to colleagues, the teacher can obtain some insights in what students would bring to, for instance, the experience of a nature walk. A teacher's knowledge and understanding of Detroit middle school students' perceptions of nature and their experiences with nature will affect her decision on the kind of nature walk and the kind of nature to which these students should be exposed.

Driver and Erickson note that these teacher investigations can be of a verbal nature, a behavioral nature or a combination of the two. They suggest that the way these two forms are used and the balance between them defines an important dimension in studies in the field of conceptual learning: *the conceptual-phenomenological dimension*. "We suggest that students' responses may differ significantly depending on whether they are investigated using a technique which is conceptually framed or one based on an actual event or phenomenon; the former eliciting propositional knowledge[2] and the latter what we call knowledge-in-action." (Driver and

Erickson, 1983; 43). Based on the research documented in this dissertation, I suggest that it is possible to obtain knowledge-in-action through interviews -- which are of a verbal nature and at least partially conceptually framed-- as long as there is a mutual understanding and trust between the interviewer and the interviewee regarding the purpose of the interview and the way the information will be used. The question is whether the relationship a teacher has with his or her students will allow for this kind of trust and understanding to develop.

Knowing what students bring to the classroom is in itself not enough to plan curricular activities. The students' ideas as well as the decisions on content are meaningless for curriculum development unless they are part of some guiding philosophy on teaching and learning that has been thought through by members of the school community, particularly teachers and administrators. Hence, it is important that teachers and administrators elicit, clarify, modify, apply, and review *perspectives on the learning process* collaboratively throughout the school year. The guiding framework I have been advocating has strong bearings on constructivist learning theories and action research, but there are others.

The fourth input to curriculum development distinguished by Driver and Oldham consists of the *teacher's practical knowledge of students, schools and classroom settings.* With this Driver and Oldham mean taking into account questions such as how to organize a group of about thirty people to do something, how to present a problem of interest to a group of seventh grade students (or better yet, how to help students select a problem of

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[2] Studies on the conceptual end of the continuum draw entirely on linguistic data using techniques such as concept mapping (e.g. Novak and Gowin, 1984 or in Environmental Education; Brody, 1991). Concept mapping is a tool to make students' "knowledge structures" explicit by constructing a map with, in the students' eyes, relevant concepts indicating meaningful relations between them, using propositions (Novak and Gowin, 1984). A criticism to this approach is that it allows for little reference to phenomena and therefore can be easily misinterpreted. This is particularly a problem with younger children whose meanings and language capability may differ significantly from those of adults (Driver and Erickson, 1983). On the phenomenological end of the continuum are tasks where there is no conceptual framing: students are presented with information of a perceptual kind which may or may not be used in responding to the task. For examples of so called theories-in-action, I refer to Rowell and Dawson, 1981.

interest), how to deal with the usual constraints of time, resources, furniture, space and so forth. I add to this input teachers' practical knowledge of students lives outside of school as well as teachers' knowledge of the culture of schooling and the hidden curriculum. Without having to investigate a student's life, the teacher will inevitably be exposed to pieces of a student's life in school that have bearing on the classroom process. For instance, the lack of safety many Detroit students feel when outdoors, and the few opportunities students have to socialize outside of a school setting will have an impact on both the outdoor learning experiences and the classroom process.

These four inputs of a constructivist model for curriculum development; decisions on content, students' prior ideas, perspectives on the learning process, and teachers' practical knowledge of students, schools and classrooms, will need to be considered when designing an environmental education curriculum or any other curriculum for that matter. They not only affect the curriculum design, but also the way it is implemented and evaluated. If, for instance, the emphasis is on knowledge-in-action as opposed to propositional knowledge, then the evaluation of students' learning will have to take this into account. If the teacher is somebody who encourages students to engage actively in the personal construction of meaning, then there need to be frequent opportunities for students to make their ideas explicit and to communicate them. In a constructivist model for curriculum development, reflectivity -- very much analogous to the process of "action and reflection" in action research based programs -- on the part of the teachers and the students becomes a crucial part of teaching and learning. Figure 6.1. on the next page summarizes a constructivist approach to curriculum development in environmental education. The model in Figure 6.1 is an adaptation of Driver and Oldham's model to accommodate environmental education interests.

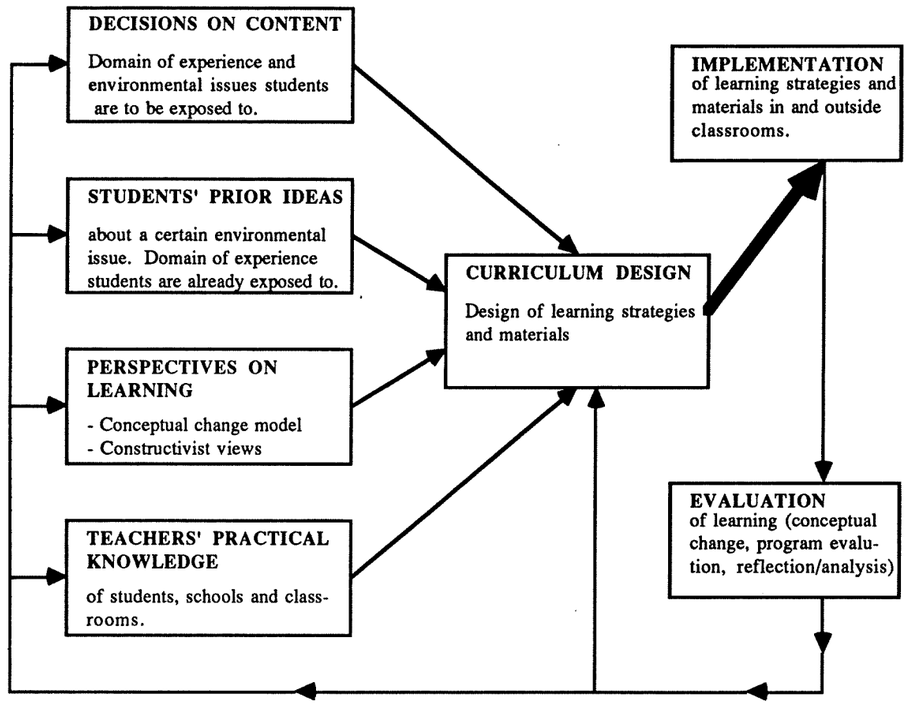


Figure 6.1. A Constructivist Model for Curriculum Development in Environmental Education. (Free after Driver and Oldham, 1986).

The actual classroom learning sequence -- which runs parallel to the teaching sequence -- that emerges from a theory of education that views learning as conceptual change contains several phases that may provide some ideas for teaching about environmental issues. For any school-based learning activity. Driver and Oldham suggest that teachers include an *orientation phase,* an *elicitation phase,* a *restructuring phase,* an *application phase* and a *review or change* phase. These phases as shown in Figure 6.2 are part of a model and, like any model, are an abstraction of reality and nothing more. Nevertheless, the model does serve as a useful guiding framework for environmental education.

I will briefly describe each of the phases and illustrate them with examples drawn from the findings of this dissertation. The first phase is the *orientation phase.* In this phase students should develop a sense of purpose and motivation for learning or for becoming engaged in a learning activity. For instance, students can be asked to make an inventory of environmental concerns in their community that they share. Through a process of negotiating and consensus-building they can then select a topic they would like to investigate further.

The second phase is the *elicitation phase.* In this phase students' ideas about the selected topic of study are made explicit or raised to conscious awareness, through a variety of activities such as group discussion, designing posters, or writing. In other words, a phase in which students describe their preconceptions about the topic both verbally and pictorially. If the students, for instance, would select garbage as their topic then students could generate a list of products that they consider to be garbage, they could write an essay on why they think garbage is a problem, and they could begin to define "garbage" in their own words.

In the third phase, the *restructuring phase,* students share, confront, and change their definitions and meanings related to the topic of study. Driver and Oldham distinguish four important steps in this phase:

Clarification and exchange of ideas. Through discussion the meanings students have constructed and the language they use, may be "sharpened up" in light of alternative, possibly conflicting, views of others (Nussbaum and Novick, 1982), and inadequacies may be pointed out (Strike and Posner, 1982). Within the classes that were part of this study, for instance, at least three different views of garbage could possibly emerge; garbage as a litter problem that is unsightly, stinks and attracts rodents; garbage as a landfill problem; and garbage as a symptom of a broader environmental problem rooted within our own lifestyles. These different views lead into the next step.

Exposure of conflict situations. Earlier I addressed the role of conflict, dissonance, and disequilibrium in conceptual change. During this step students discuss their own ideas and debate the pros and cons of their way of

looking at the topic of investigation. This debate will increase their awareness and understanding of the differences between their own ideas and those of their classmates. Particularly, during this step it becomes important that students' ideas are valued and accepted. To continue with the garbage example: when exposed to a student's account of lack of landfill space and the air pollution that results from incineration, a student who previously thought garbage was only a problem when the alley containers are left open or not picked up on time may have to rethink his position. This leads into the next step.

Construction of new ideas or modifying of old ideas. This step also requires a positive and safe environment (Claxton, 1984), since it is here where some key concepts and their relationships may be scrutinized. Posner and his colleagues suggest that a teacher use anomalities, analogies and metaphors to induce the formation of new ideas. A teacher could ask students to figure out how many pounds of garbage their families generate per week and how much space this would take up if not compressed. Based upon an obtained average per person, students could then figure out how many weeks it would take the number of people in a sold-out Tiger Stadium to fill up the entire ballpark with garbage. This activity may help students grasp the magnitude of the garbage problem.

Evaluation of alternative ideas. The various ideas that have been developed until now are compared. If suitable, students can be given the chance to be imaginative in devising ways of "testing" these ideas (Nussbaum and Novick, 1982; Osborne, 1981) or confronting them with the reality as they see it. Driver and Oldham suggest that different groups of children explore different ideas and report their findings to the whole class. As a result of this exploration and confrontation, students may feel dissatisfied with their existing way of looking at the topic of investigation and therefore be more inclined to change their perception. If it appears that a certain view on the topic is missing or not represented by any of the students in the classroom then the teacher will have to introduce the class to this alternative way of looking at the problem. If for instance, the view of garbage as a symptom of a larger environmental problem rooted in the way we live and the choices we

make is missing, then the teacher may want to bring this perspective to the students' attention.

In the fourth phase, *the application phase*, students are given the opportunity to use their developed ideas in a variety of situations, both familiar and novel. This phase aims at the consolidation and reinforcement of new conceptions by extending the contexts within which they are seen to be useful (see also: Kaplan and Kaplan, 1982). Posner suggests that an important factor in acquiring a new conception is whether or not it has the potential to be extended to open up new areas of inquiry. If students, for instance, can translate the growth concept associated with garbage generation to other areas of inquiry in environmental issues (e.g. population growth or algae blooms), then this concept may become more meaningful and can be applied in a broader context. Not mentioned by Driver and Oldham, but generally recognized by environmental educators to be, if not essential, then at least optional, is the action component of an application phase. This would require students to generate some solutions to the environmental issue they have identified and (re)defined to which they themselves could contribute.

In the fifth and final phase, the *review phase*, distinguished by Driver and Oldham, students are invited to reflect on how their ideas have changed by drawing comparisons between their thinking now and at the start of the learning process. They may also have been given the chance to monitor their own learning through the use of journals (Holly, 1984; Di Chiro and Stapp, 1985; Wals, 1989). By comparing their new ideas on, for instance, the garbage issue with their old ones, students may recognize the way their thinking has changed. The evaluation or review phase can help students in recognizing the way their ideas have changed and encourage them to develop, what Novak and Gowin refer to as meta-cognitive strategies, or learning about their own learning (Novak and Gowin, 1984). Driver and Oldham note that an important condition for the successful implementation of a constructivist teaching sequence is that there is sufficient time for students to share, reflect on evaluate and restructure their ideas. The main idea here is not for the teacher to assess students' knowledge, but help students recognize how their thinking regarding a certain topic has changed or has kept from changing during the course of the learning sequence. The review phase serves to

promote or stimulate further learning as opposed to assessing and freezing propositional and/or factual knowledge by a terminal test.

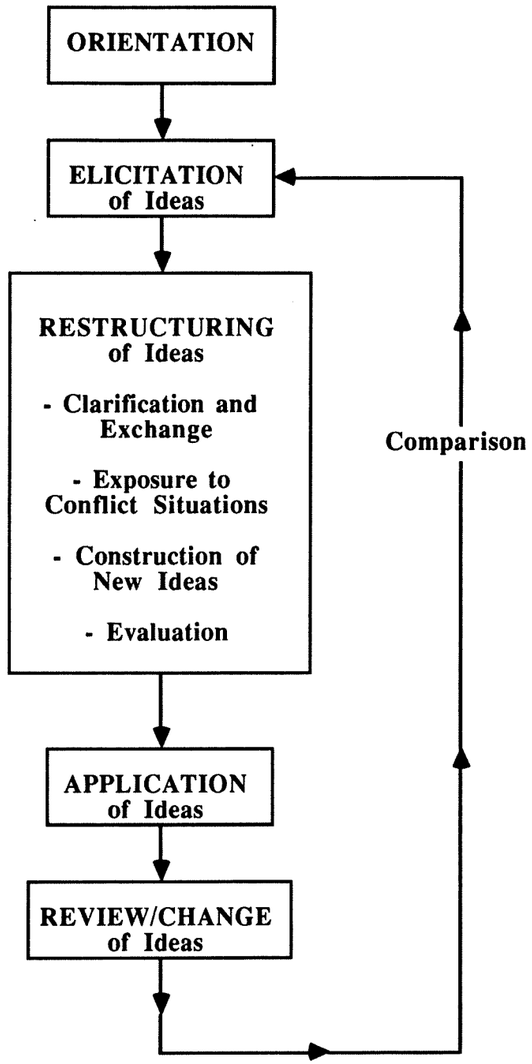


Figure 6.2. A Constructivist Teaching and Learning Sequence. (Free after Driver and Oldham, 1986)

The five phases and their relationships are summarized in Figure 6.2. The more concrete recommendations concerning the role of students' perceptions of nature and environmental issues in environmental education should be seen in light of the constructivist approaches of learning that have been discussed in this chapter.

6.4. Summary and Conclusions

In the final section I summarize the main findings, implications and recommendations of this study. Although against conventional protocol -- which prescribes that in a section like this no new information appear-- I will occasionally illustrate a point by introducing a fresh example not used earlier. The order of the findings follow the order of the chapters of this dissertation. This means that I will start with some conclusions regarding the middle school students' perceptions of nature and their experiences with nature, then list some conclusions regarding their perceptions of environmental issues, and end with some conclusions regarding the implications of taking a constructivist approach of learning in an environmental education program.

The list below is not the only list that can be generated from reading and interpreting the research, but one of many. The list presented here is my own selection and reflects to a degree my own biases as I have tried to make them explicit throughout the study. Other readers, with different biases, purposes and interests, might generate a different list. Nevertheless, I hope that all readers find something relevant, if not in this list, then in the more inclusive and exhaustive chapters of this dissertation.

On Nature Experiences:

* Experiences <u>in</u> nature are not just necessary to teach <u>about</u> nature or even to teach <u>for</u> nature they appear to play an important, more existential role in personal development and spiritual growth. Without experiencing nature in

all its dimensions (see Table 4.1.), the role of nature experiences in environmental education programs is far too limited.

* Nature experiences cannot be replaced by lessons about nature. In order to avoid that students learn about nature deprived from opportunities to connect to nature (emotional attachment) -- which in effect degrades nature education to a rhetorical exercise -- schools need to provide students with rich, in-depth experiences both inside and outside the school building.

* Students who live in a suburban or rural environment have more opportunities to have meaningful interactions with or in nature than students who live in the city. The suburban or rural school should as much as possible use the immediate surroundings of the school building when discussing and experiencing nature and/or elements of nature. Students who live in a totally urban setting in which the dangers of the street (Chapter III) make it difficult for them to engage in any outdoor activities, not to mention to explore any local nature areas. Many of the Detroit middle school students have developed, in addition to many positive images of nature, a strongly negative image of nature as a dangerous place where they can get hurt or killed. The city schools, very much aware of the risks of going on a local outdoor field trip, would rather not go outside at all. We should realize that the neighborhood environment of many of the Detroit students can be such that it deprives them of a basic right of childhood -- the right to experience and explore the world around them safely, sponteneously, and on their own terms. (Berg and Medrich, 1980).

* To provide the city students with more opportunities to experience nature, nature experiences will have to be brought to the school grounds and into the classroom, to complement the sporadic trips to areas outside of the city. The concepts of school gardens, city farms, plants and animals in the classroom, planting trees on school grounds, deserve renewed attention in environmental education programs along with neighborhood improvement plans. In addition, teachers, possibly by means of in-service training, should become familiar with strategies to use elements of nature and the processes of nature that can be found in the immediate surroundings of the school building, even or especially when that building is in the city. Both Detroit

middle schools involved in this study have plenty of open spaces in the immediate school area that either have or could have elements of nature. Using nature within the city and creating green safety zones or green islands in the city cannot be separated from addressing the social issues identified in the chapter on the students' lives. Several of the Detroit students make that connection themselves when they associate blocks with maintained yards, clean alleys and lots of trees as relatively safe blocks free from drug related activity, with people who care about their environment and their community. Obviously, the lack of safety in the community greatly limits students' possibilities to go outdoors.

* Nature walks during school hours should be structured in such a way that they allow students to experience nature in a variety of ways. This means that rather than emphasizing nature as merely a place to learn, educators should allow students to develop all the dimensions they already ascribe to nature: a place to explore, a place to find challenges and overcome fear, a place to relax and reflect, a place to gather socially, a place that exists on its own without overt human influences and a place that is being threatened by humans. To allow students to experience nature in a variety of ways also implies that students should be able to use all their senses: sight, smell, touch, taste and hearing. By emphasizing nature as a place to learn in a purely analytical sense, students may become turned off to nature.

* Within the same age group (12-14 years old) there are a variety of interpretations of the concept of nature. Some of these interpretations are quite concrete, for instance, nature as living animals, plants and trees. Others are more complex and possibly less concrete, for instance nature as threatened place or nature as a reflection of the past. Students have display different levels of understanding when describing nature and phenomena related to nature. Some of the students talk about the food chain, habitats, and photosynthesis, while others have either never heard of these concepts or would not be able to discuss them meaningfully. Before introducing students to ecological concepts -- which are generally abstractions of reality -- it is wise to make an inventory of both the different interpretations of nature and the different levels of understanding displayed by students in describing natural phenomena. Teachers can utilize old measures to make abstract concepts

such as habitat, the food chain and decomposition more concrete by bringing the terrarium, aquarium, and worm hotel back into the classroom[3] and by eliciting students' own ideas about these concepts.

* In addition to inviting city schools to their visitor center, naturalists and environmental educators stationed at nature centers should actually visit schools. Part of this outreach could help teachers and students recognize elements and processes of nature in and around the school building, to help teachers and students set up micro-habitats in the classroom, to help teachers and students create school gardens and to bring elements of nature (including animals) to the classroom.

* Nature experiences form a good transition to learning about environmental issues. Several lead-in concepts emerged during the interviews including: human-made nature versus real nature, nature (trees) as a filter of air pollution, species on the verge of becoming extinct, the mobility of neighborhood animals, new housing developments in the expanding suburbs and the presence or absence of weeds. Some students view nature as a threatened place and have actually experienced nature as such. For those students the transition to environmental issues might be particularly easy. However, a word of caution deems appropriate here. Although it may be an important phase in becoming environmentally conscious, perceiving nature as a threatened commodity could become problematic when this perception comes to dominate all other perceptions of nature. In the extreme case a walk through nature could become a reminder of how beautiful things used to be and of how we are destroying our earth, in effect making for a rather unpleasant and depressing experience.

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[3] In the last decade we have witnessed the disappearance of animals from the classrooms for public health reasons (mainly allergies) and animal rights concerns. To bring back elements of nature into the classroom and to illustrate natural processes, many biology teachers are creating micro-habitats in the classroom that do not pose a health threat to the students. The worm hotel may serve as a good example: an old aquarium tank is partially filled with soil, leaves, other organic materials and a number of worms and other soil-dwelling creatures. Students see how leaves and other organic materials are converted into rich soil that can be used to support plants in the classroom. Students have an opportunity to overcome their fear of worms and understand concepts such as biodegradable waste and decomposition. These concepts form an easy transition to the discussion of municipal waste management, the use of landfills, managing your own, etc.

* When nature experiences allow for young adolescents to experience and explore nature in all its dimensions, safely, spontaneously, and, as much as possible, on their own terms, then perhaps these experiences can cultivate a "state of being that sustains the widest and deepest possible identification of oneself with one's environments. "(Fox in Gough, 1989; 31). Perceived in this way, nature experiences can help in broadening our sense of the world while deepening our sense of ourselves.

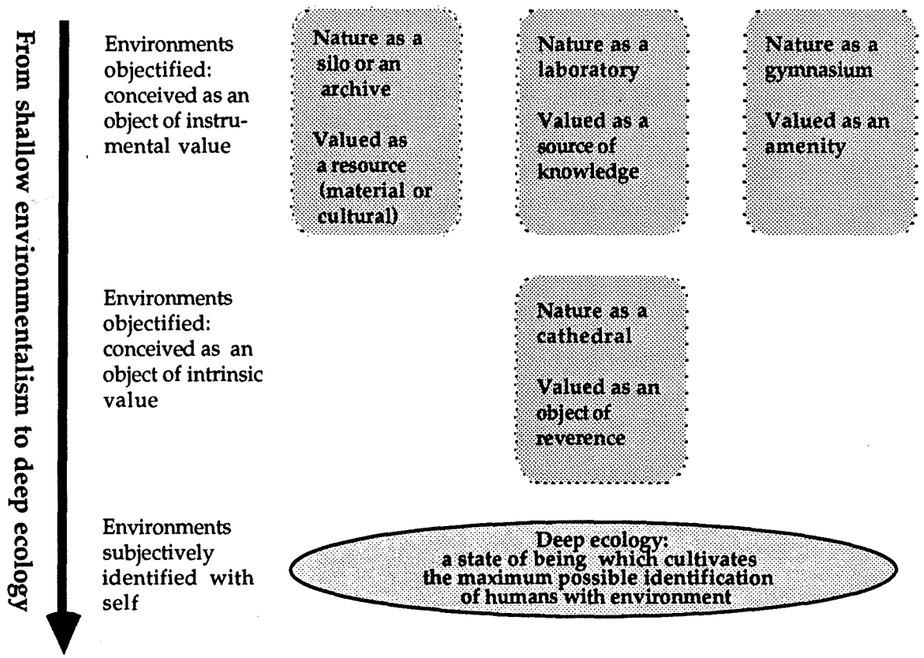


Figure 6.3. From shallow environmentalism to deep ecology (after: Noel Gough, 1989; 35)

Figure 6.1. may provide helpful in envisioning a process that leads from, what Gough terms as, shallow environmentalism to deep ecology. Note that the different boxes Gough distinguishes in the figure can be found among the young adolescents who took part in this study as well, but that at the same time there are many other ways of perceiving and experiencing

mature that cannot be found in the figure. The figure mainly serves to illustrate extremes and a path from one extreme to the other.

On Perceptions of Environmental Issues

* It is clear from the findings on the middle school students' perceptions of environmental issues that there are three distinct but related conceptions of pollution and environmental issues. These distinct views bear such relevance on teaching about environmental issues that I will repeat them in abbreviated form.[4]

I. The personalistic view: Pollution can be touched, smelled, tasted and seen. Once it can no longer be sensed, pollution is no longer a threat to our health. Pollution is mostly a local problem and does not have the ability to spread out to far away places. Out of sight is out of mind, in the eyes of these students. The effects of pollution are mostly a concern for humans and not for other animals or plants. Effects are acute upon physical impact.

Environmental problems are mostly physical problems that are a direct result of our own individual polluting behavior which is subject to our own individual control. Environmental problems are not viewed as problems of human nature or as cultural problems. Solutions to pollution are found in changing our own polluting behavior (e.g. stop littering) and helping clean up polluted areas (e.g. pick up litter).

II. The technocratic view: Pollution cannot always be detected by our senses for it can be present without being noticed. Pollution can spread out to far-away places via water and air, and poses a threat to humans and other species alike on a global scale. Pollution accumulates overtime and does not disappear when it is out-of-sight. There are many indirect ways, e.g. using

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[4] These distinct views or perceptions of pollution and environmental issues should not be seen categories in which certain students "fit" while others do not. One and the same student can adhere to multiple views depending on the topic of discussion, prior experiences and the situation she finds herself in. This is not to say that they are not distinct views, that some views are not more prevalent than others, that there is no hierarchy in levels of understanding that underlie these views or that all students think at all three levels.

electricity, in which people contribute to pollution. Pollution is an inevitable result of the way we live. Students are able to talk about specific global environmental problems such as acid rain, ozone depletion, and global warming, but have only a fragmented understanding of these issues that makes it difficult for them to distinguish them from one another. Students seem to think that environmental issues have the potential to destroy all life on earth. By developing new technologies that filter pollution from water and air, it may be possible to have both industry and a clean environment. Students do not challenge the presence of industry or our life-styles, and emphasize cooperation between people along with technological solutions as the proper response to addressing environmental problems.

III. The political view: Students see environmental issues as global issues and link pollution problems to rapid population growth. When discussing global environmental problems, students display a coherent understanding of problems such as acid rain, ozone depletion and global warming and are able to distinguish them from each other. Pollution is seen as the result of our modern industrial society that people themselves have shaped by their decisions, actions and values.

Students suggest that in addition to exploring new technologies, we change our life-styles to accommodate reducing, re-using and recycling. They hint at the idea of "limits to growth." Students also suggest that the interests of industrialists and a clean environment are in conflict. People can send a message to industry by boycotting polluting products.

These three levels have implications for environmental education curriculum design:

* It should be expected that within the same classroom, different conceptions of pollution and environmental issues can be found that are bound to solicit different reactions from students. These differences in perceptions and reactions can be taken advantage of when elicited and understood by the teacher. When teachers engage in a process of questioning and probing dialogue with the students, similar to the interviews used in this research, students' perceptions of environmental issues can be elicited. Once this has

been done, the dissonance that may result from the different ways of looking at environmental issues may lead to better understanding. The role of conflict and confrontation between different ways of looking at the world in ascribing new meaning or re-interpreting to existing concepts or ideas should be explored further.

* All students in this study in one way or another are concerned about pollution, regardless of the context in which they grow up. This is particularly noteworthy when looking at the Detroit students and the challenging circumstances they find themselves in. In addition to their concern with tremendous social problems in their community, they are also concerned about classic environmental problems such as acid rain, the atmospheric greenhouse effect and destruction of the rain forests. There is definitely an interest among students in learning more about these issues.

* Many students appear to have so called "misconceptions" about certain environmental issues. Some of these alternative conceptions emerge from a different interpretation of cause and effect relationships (e.g. acid rain damages your car), some stem from an alternative evaluation of the seriousness of certain forms of pollution (e.g. the exaggeration of the effect of visible organic and the underestimating of non-visible pollution), and some emerge the perceived relationship between environmental issues (e.g. equating the hole in the ozone layer with the atmospheric greenhouse effect). These are only a few of the so-called misconceptions that emerged from the interviews. We have to be careful with judging these misconceptions -- the word misconception is a poor choice of words -- since they are not necessarily wrong; certainly not in light of the students' own experiences. It is hard to deny, for instance, that acid rain damages your car or your hair. It appears that any environmental education program that wishes to address an environmental issue should explore any potential "misconceptions" or "mini-theories" students might have regarding these issues. There is a wide body of research that shows that many people, even in light of contradictory information, tend to hold on to conceptions that flow out of their own experiences. Conceptual change can occur in a non-threatening, non-condescending and non-judgmental learning environment that will allow

students to arrive at a new position through exploration and investigation, in cooperation with their peers.

* Although teachers and schools are able to and should provide meaningful learning experiences, one cannot control what an individual will experience. What the reader brings to a good novel is just as important as the novel itself. The students who were a part of this study bring different perspectives, backgrounds, concerns and interests to an environmental education experience. It is therefore not possible to predict what the students will experiences, but it is possible to ask from the students to reflect on the experience verbally and in writing in order to improve future experiences.

* How can we teach about environmental issues without overloading students with complexity and the feeling of being overwhelmed that surrounds pollution and environmental issues? The argument that young adolescents should not be burdened with adults' problems can be rejected. This dissertation shows that young adults are already burdened with these problems. Not providing them with an opportunity to deal with their concerns seems unfair. There are ways to keep students from getting bogged down or disillusioned by these issues. Schools could focus on manageable local issues of the students' interest. In finding a local solution a class could spiral outwards to other parts of the world where similar issues have been dealt with. Students should be given opportunities to create solutions by themselves in cooperation with community resources. Finally, the role of success stories in countering feelings of hopelessness and helplessness should be considered as well.

On Constructivist Approaches of Learning

* A constructivist approache of learning provides a useful guidance to environmental educators who;

- emphasize the crucial role of students' prior knowledge and ideas which are the result of their own experiences;
- consider learning to be a process of conceptual change;

- recognize the difference between propositional knowledge rooted in cognitive skills, and knowledge-in-action rooted in experience;
- recognize the consequences of the above position for curriculum design, implementation and evaluation.

* Any environmental education curriculum that emerges from a constructivist approach of learning should build upon four main inputs: *decisions on content* which deal with the domain of experience and the environmental issues students are to be or are already exposed to, *students' prior ideas* about a certain environmental issue, *perspectives on teaching and learning*, and *teachers' practical knowledge* of students, schools and classrooms.

* A conceptual change approach to learning should include a consideration of a teaching sequence that includes;

- an *orientation* to an environmental issue in a way that connects with students' prior experiences which may increase a students motivation and sense of purpose to participate in a learning activity;
- the *elicitation of ideas* to give students an opportunity to raise consciousness and make explicit any ideas they already have about an issue;
- the *restructuring or changing of ideas* through a process of clarification, exposure to conflicting or alternative views, forming of a new view, and evaluation of the merits of this new view compared to the old one;
- *application of the newly formed ideas* towards a solution to the issue at hand and/or towards other areas of inquiry in a different context;
- the personal and collaborative *review of the change* that occurred in the learner as a result of the learning activities through a process of reflection.

APPENDICES

APPENDIX A

Parent Notification Letter Used by Colby Middle School[1]

January 31, 1990

Dear

I am writing to inform you of an activity that I would like your child to participate in. Every year my seventh grade science classes at Colby work with the School of Natural Resources at the University of Michigan on a project that involves testing the waters of the Rouge River. The main emphasis of this project is for students to be made more aware of the pollutants that are in the river, and for them to discuss possible methods to make rivers more clean.

One of the graduate students who is part of the project is doing a doctoral dissertation of an environmental nature. He proposes to:

1) Interview eight students from four different middle schools from the Detroit area.
2) Ask them their concerns about the environment and what they feel might be important environmental issues.
3) Ask them if they feel affected by these issues and how they might play a part in resolving their environmental concerns.

He would like to interview each student for one class period. He would like to tape record his conversation with them so that it might be transcribed for further analysis. The identity of each participant would be confidential.

His criteria for picking students to be interviewed were that there be an equal number of boys and girls, that the students have lived in the area for at least several years, and most important, that the students are thoughtful, articulate and would respond well in an interview process.

Dr. Connor and I discussed possible seventh grade candidates and have decided that your child would be an excellent choice to be a part of this experience. We wanted to make you aware of your child's participation in this project. If you have any further questions about the interview you can contact either one of us at Colby.

Please sign the accompanying form and have your child return it to me at Colby so that I know that you have received this. Thanks for you in support in this matter.

Yours truly,

Elaine Connor, Principal
Joe Kirchner, Seventh Grade Science Teacher

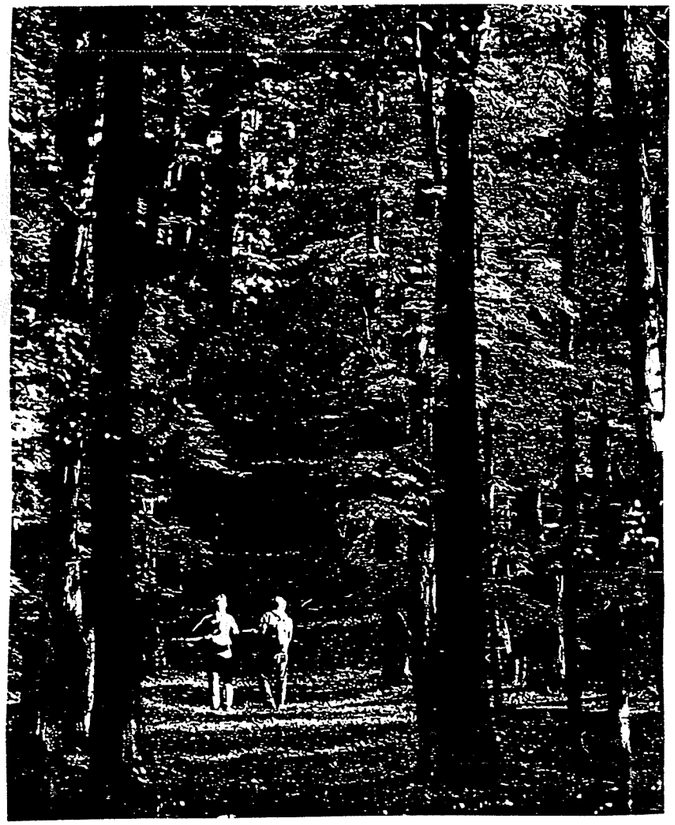
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[1] This letter was prepared by the involved teacher from Colby middle school and co-signed by the principal. Names have been changed.

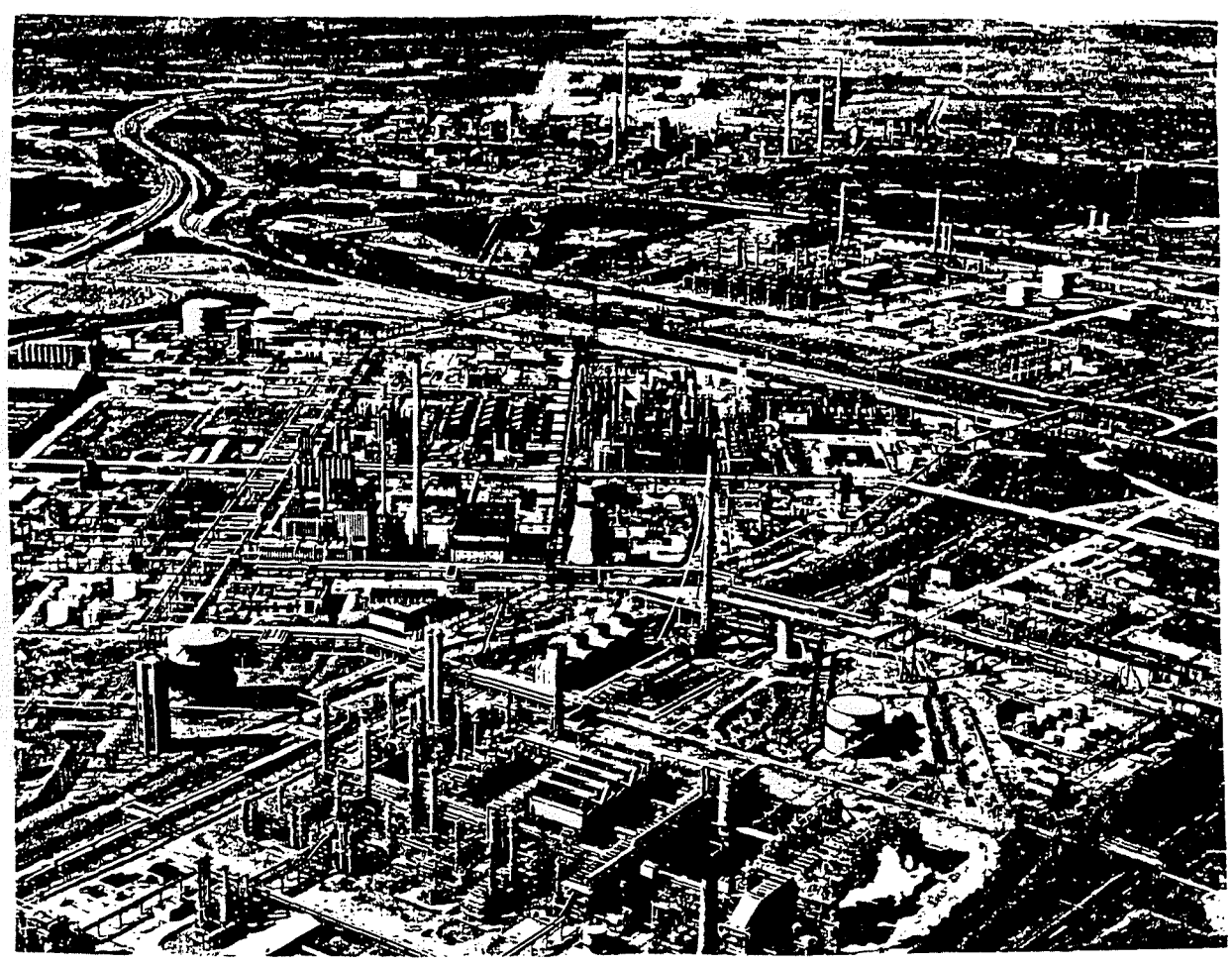
APPENDIX B

PHOTOGRAPHS USED DURING THE INTERVIEWS

The four photographs were shown to all students at the end of the interview. Students were asked questions such as "What do you see?" "Have you ever been to such a place?" "Could this be near your neighborhood?" "Do you see any pollution in this picture?" and "How does this picture make you feel?" All questions were open-ended. All photographs were in color.



Picture I: A man and a woman with hiking gear walking in a dense green forest with mature deciduous trees. A thick layer of brown leaves covers the soil and the sun penetrates through the branches.



Picture II: Industrial park with oil refineries. Lots of smokestacks with some smog development in the horizon. Two main highways intersect in the northwest corner. A noticeable amount of green fields and several rows of trees can be found in between refineries.



Picture III: Back alley of a street in a Detroit neighborhood. Shown is a tipped over garbage container surrounded by garbage. Some bear trees in winter appearance and a satellite dish.



Picture IV: Point source pollution in what looks like a forest area. The fluid coming out of the pipe is of a rusty red/orange color. The pipe is surrounded by brown leaves.

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