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Children's Exposure to the Natural Environment and their Environmental Attitudes
(An Exploratory Study)
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CHILDREN'S EXPOSURE TO THE NATURAL ENVIRONMENT AND THEIR ENVIRONMENTAL ATTITUDES
(An Exploratory Study)

By

Nancy Anne Surbrook

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ABSTRACT

CHILDREN'S EXPOSURE TO THE NATURAL ENVIRONMENT AND THEIR ENVIRONMENTAL ATTITUDES

By

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This study examined the relationship of children's exposure to the natural environment and their environmental attitudes at varying age levels. Children were divided into three age groups of 4, 7, and 10 years old. There were 34 four-year-old children, 22 seven-year-old children, and 29 ten-year-old children. Children's exposure to the natural environment and their environmental attitudes were examined overall as well as between age groups. The results indicated that environmental attitudes vary at different age levels, with the 7-year-old children's environmental attitude mean score being the highest of the three groups. The 7-year-old group also had a slightly higher mean score for their exposure to the natural environment. Because of these findings and the developmental stage of a 7-year-old, it seems that seven years old may be a critical time in the formation of environmental attitudes. This theory must be investigated further.

To Jerry, for your patience, support, and encouragement in completing this project.

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CHAPTER 1

INTRODUCTION

Environmental awareness in children is becoming increasingly more important in today's society. To retrieve and restore the natural environment, adults need to create changes in attitudes and behavior in children to promote better conservation of our limited, natural resources (Cohen, 1992).

Awareness of the natural environment must be established at a young age to promote positive habits and attitudes toward the natural environment later in life (Strickland, Robertson, Jettinghoff, and Diener, 1983/84). Appreciation of, and respect for, the natural environment is often developed through interaction with it (Barnhart, 1973). An awareness of the natural environment can be observed in young preschool children (Bunting & Cousins, 1985). As children experience nature firsthand, they form attitudes about it. Children become aware of the natural environment only when they come into contact with it and it affects them in a significant way (Cohen, 1992).

As children's boundaries extend beyond the caretakers and home, the natural environment plays an increasingly significant role in children's lives (Kirby, 1989). "A natural setting has the degree of complexity, plasticity, and manipulability which allows a child to experience and develop significant play behaviors" (Kirby, 1989). Some of these behaviors are role-playing, cause-effect actions, and constructive play.

Children's attitudes and learning habits develop early in life (Strickland, Robertson, Jettinghoff, and Diener, 1983/84). Therefore, children need to develop environmental concepts at an early age. As they grow older and gain outdoor experiences, their environmental attitudes begin to develop (Pettus, 1974). These attitudes are related to environmental behavior (Malkus & Musser, 1994).

Since children acquire knowledge through experience, outdoor exposure should increase their knowledge. With knowledge and experiences, attitudes are formed. To produce positive attitudes toward the natural environment, increased exposure to the natural environment should be necessary.

There has been limited research conducted to determine the relationship between children's exposure to the natural environment and their environmental attitudes. Studies that have been conducted have focused on energy education in preschool children, (Strickland, Robertson, Jettinghoff, and Diener, 1983/84), exposure to, or knowledge of, the natural environment, [Gillett, Thomas, Shok, & McLaughin (1991), Kostla (1976), Dresner & Gill (1984), Frances, Boyes, Qualter, & Stainistreet (1993) and Castle (1996)] and environmental attitudes [Hines, Hungerford, & Tomera (1986/87), Malkus & Musser (1994), Bunting & Cousins (1985), Harvey (1989), Jaus (1984), and Shepard & Speedman (1985/86)]. This study will determine if children's environmental exposure influences their environmental attitudes at different age levels.

Problem Statement

This study will investigate the relationship of the exposure to the natural environment and environmental attitudes in children between the ages of four, seven,

and ten. This study will also investigate age related differences in children's exposure to the natural environment and their environmental attitudes.

Conceptual Definitions

Age is the chronological number of years an individual has lived (Webster's Dictionary, 1990).

Exposure to the Natural Environment is defined as the amount of the time spent outdoors, as well as, how much the individual child enjoys being outdoors. It also includes how often individuals participate in environmental movement activities such as composting materials and recycling garbage.

Environmental Attitudes are the predispositions that are considered to represent an individual's environmental personality (Bunting & Cousins, 1983).

Pastoralism is the enjoyment of the natural environment in an intellectual and aesthetic fashion (Bunting and Cousins, 1983).

Family is "a bonded unit of interacting and interdependent persons who have some common goals and resources" (Andrews, Bubolz, Paolucci, 1980).

Operational Definitions

Age of the children examined in this study were four, seven, and ten years old.

Exposure to the Natural Environment was measured by a survey administered to the parents (Appendix D, Parent Survey). They were asked questions about their families' outdoor activities. The parents were asked about the frequency of their trips to parks, beaches, and campgrounds and how much their child/ren enjoyed these outdoor activities.

Environmental Attitudes were measured by an adapted version of the pastoralism domain from Bunting and Cousins (1983, 1985) "Children's Environmental Response Inventory" (CERI). This form was adapted to be suitable for younger children (Appendix D).

Pastoralism was measured through the "Children's Environmental Response Inventory Adapted" (CERIA) scale (Appendix D).

Parents in this study consisted of the mother/father or the primary caregiver of the children.

Ecological Framework

Children gain knowledge, experiences, and attitudes from other family members (Sontag & Bubolz, 1993). Families are part of the total life system, interdependent with other forms of life and the nonliving environment (Sontag & Bubolz, 1993). Every environment is interrelated and influences each other (Sontag & Bubolz, 1993). See figure 1.

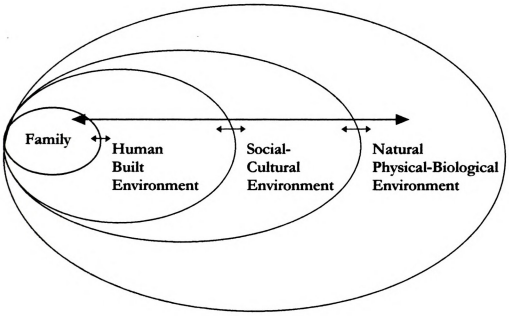


Figure 1: Family Ecosystem

(Sontag & Bubolz, 1993)

The values and attitudes parents incorporate into their family are part of the societal norms and values. This is part of the social-cultural environment (Sontag & Bubolz, 1993). Peers and community systems are also part of this environment. Children acquire their attitudes based on those of parents, family, and friends (Remmers, 1954).

Another environment that interacts with the family is the human-built environment. This environment consists of man-made materials and resources, such as housing, roads, and pollutants in the air and water. These materials and resources directly influence the natural, physical/biological environment (Sontag & Bubolz,

1993). The natural physical/biological environment consists of the atmosphere, climate, water, air, and other items in nature. The human-built environment often alters many aspects of the natural physical/biological environment, which affects the family as well as the children (Sontag & Bubolz, 1993).

Research Objectives

The main purpose of this study was to investigate children's exposure to the natural environment and to measure their environmental attitudes to determine if there are differences across age groups. The objectives were:

1. To assess children's exposure to the natural environment at different age levels.
2. To assess the environmental attitudes of children at different age levels.
3. To determine if a relationship exists between children's exposure to the natural environment and their environmental attitudes.
4. To assess the relationship between children's exposure to the natural environment and their environmental attitudes at varying age levels.

Limitations of Research

One limitation of this research was the measurement tools used to evaluate the children's exposure to the natural environment and their environmental attitudes. Since appropriate measurement tools could not be found, a tool to evaluate the exposure to the natural environment was created (Appendix D). In order to measure environmental attitudes a scale created by Bunting and Cousin's, "Children's Environmental Response Inventory" (CERI;1983) was adapted to be suitable for the younger age group (Appendix D).

Another limitation was in finding schools to participate. Because the research was not related to reading, writing, or arithmetic, the majority of the schools that were contacted declined to participate in this study. The low participation rate limited the data collection and sample size.

The last limitation to this research was in the sample collected. The sample size was small. The majority of the parents who participated were of a high socio-economic status level, lived in a suburban area, and had a college degree. Therefore, this sample was not representative of the total population and cannot be generalized to the overall population.

Summary

Because research related to children's exposure to the natural environment or their environmental attitudes is limited, this exploratory study investigated children's exposure to the natural environment and their environmental attitudes at different age levels, specifically ages 4, 7, and 10 years old. The purpose of this study was to evaluate these relationships so that educators and researchers would have more information about the impact of the natural environment on children's environmental attitudes.

The following chapter includes a literature review of related research. Chapter three contains the sample description and the methods used in the study. The results are presented in chapter four. Discussion, implications, and directions for future research are presented in chapter five.

CHAPTER 2

REVIEW OF LITERATURE

Many people believe the best way to learn about the natural environment is though environmental education programs (Gifford, May, & Boros, 1982/83). Although environmental education programs do teach individuals about the natural environment, children require hands-on experiences to understand the abstractions of the natural environment. Unfortunately, many environmental education programs do not include hands-on experiences in the natural environment (Regan & Fazio, 1977).

Many times, awareness of the natural environment is encouraged and promoted by significant adults in a child's life. Adults must first be environmentally aware and have positive attitudes toward the environment to insure children will acquire the same positive attitudes.

The following review of literature focuses on attitude formation, environmental attitudes, exposure to, and knowledge of, the natural environment and age differences in environmental studies.

Attitude Formation in Young Children

Attitudes are known as "typical reaction patterns individuals develop toward life events" (Kostelnik, Soderman, Whiren, 1993). The foundation for attitudes begins in early childhood and continues throughout a lifetime. Children's attitudes are formed based on interactions and observations of other individuals in their environment and life experiences.

Environmental ecology deals with living things and their surroundings (Sontag & Bubolz, 1993). Every environment that the child interacts with has an impact on his

or her attitude formation. Being a part of the family, a child gains knowledge and experiences from other family members. The family exists in an environment containing and interacting with many other environments. From the birth of an individual into the family, a system of attitudes is continually being built and elaborated upon (Rabin, 1985). Attitudes are partly formed on the basis of information one is exposed to (Rabin, 1985).

One of these environments is the socio-cultural environment, which consists of the interactions of the school and peer groups with the family and its individual members (Sontag & Bubolz, 1993). According to Remmers (1954), an individual will acquire attitudes similar to his or her parents, friends, and other primary groups. The closer the relationship is, the greater the influence will be in the formation of attitudes (McNab, 1976).

Another environment is the human-constructed environment, which consists of man-made materials and resources. Some of these materials and resources are housing, communication systems, government, and religion (Sontag & Bubolz, 1993). The human-built environment consists of the changes people make in the natural, physical/biological environment for survival and other needs as well as pleasures. Therefore this environment has an impact on how individuals and families may interact the natural, physical/biological environment (Sontag & Bubolz, 1993). The natural, physical/biological environment consists of the atmosphere, climate, water, animals, and all other items in nature.

All of these environments are interrelated and therefore influence each other. The natural environment provides essential resources for all life on earth (Sontag &

Bubolz, 1993). In order to continue to provide essential resources which everyone uses this interrelationship must be protected. Therefore there is a need to take into account the interrelationship between the family and the natural physical/biological environment, as well as its impact on the developing child (Sontag & Bubolz, 1993).

Environmental Attitudes in Varying Age Groups

Some studies have been conducted to determine what variables relate to the environmental attitudes of individuals. Environmental attitude is defined as the "values, attitudes, and predispositions considered to represent an individual's environmental personality" (Bunting and Cousins, 1983). In the following studies, some of the variables that are related to environmental attitudes are age, environmental education programs, and outdoor recreational activities. Most research at the elementary age level focuses on instilling positive environmental attitudes. This is because the main goal of environmental education programs is to create positive attitudes that children can incorporate into their behavior. A positive environmental attitude is when "an individual views him/her self as part of the natural world, feels a personal responsibility for environmental problems and has an awareness of the ramifications of the choices in environmental decision making" (Kostka, 1976).

Hines, Hungerford, and Tomera (1986/87) performed a "meta-analysis" of attitudinal variables to see how attitudes influence individuals to take responsible environmental actions. They investigated attitudes toward ecology, the environment as a whole, and environmental actions. Hines, et al. (1986/87) concluded that individuals with positive environmental attitudes are more likely to act more

responsibly toward the environment than those that do not have positive environmental attitudes.

Hardy and Fox (1976) compared high school students' environmental knowledge and environmental attitudes from rural, suburban, and urban settings. They found that among the rural high school students there was not a significant relationship between their environmental attitudes and their knowledge, but in suburban and urban high school students there was a significant relationship found. This was believed to be because the instrument used was not appropriate for rural students because of the lack of emphasis on value clarification. This study indicated that the area of residence may affect environmental attitudes and knowledge.

Malkus and Musser (1994) found that elementary school aged children, ages 8 to 12, who had positive environmental attitudes were more likely to choose to participate in environmental activities when given an opportunity to decide. Children who felt positive about environmental issues and their role in helping the earth also felt more positive about themselves. It was found that environmental attitudes related to environmental behaviors in elementary school aged children.

Bunting and Cousins (1983) developed an instrument that examined children's attitudes about the natural world. The "Children's Environmental Response Inventory" (CERI, 1983) measures environmental attitudes of children, age nine and older. The CERI is a modified revision of an existing environmental attitudes' instrument developed by McKechnie (1974). This instrument is called the "Environmental Response Inventory" (ERI) and has been designed for individuals 16 years of age and older. When developing this instrument, Bunting and Cousins

(1983) took into consideration that children develop environmental attitudes at a relatively early age. The CERI has been used in a number of studies concluded by Bunting and Cousins (1983), as well as other researchers. One study conducted in order to test the instrument was evaluated with 1109 students of varying age levels. The CERI test was found to be reliable with a Cronbach $\propto$ ranging from .78 to .91 (Bunting & Cousins, 1983). Validity was found to be generalized from the Environmental Response Inventory (ERI) developed by McKechnie (1977).

The CERI was implemented in a study conducted by Harvey (1989). She used the instrument to study the relationship of children's past direct experiences with the natural environment to their present attitudes about the natural environment. She surveyed elementary school age children, ranging from age 8 to 11, from varying environments. Harvey examined the association between children's past experience with vegetation and different demographic characteristics such as gender, age, and socio-economic status. When evaluating the differences in gender, boys enjoyed contact with vegetation as a play object more than girls. Girls' attitudes toward vegetation were consistently more positive than boys'. Age was significant when the direct experience with vegetation was as a play object. The older children enjoyed exposure with vegetation as a play object more than the younger children. The higher the socio-economic status of the children, the more varied their past direct experiences with the natural environment had been. The data show that the past direct experiences with the natural environment of school age children varied according the gender, age, and socio-economic status. When examining environmental attitudes, Harvey (1989) found that any past direct exposure was a

positive influence on environmental attitudes. The children also reported that they did not have enough opportunity for the outdoor activities that they enjoyed.

Jaus (1984) studied the development and retention of environmental attitudes in elementary school aged children. Students were given a pre-test to discover their present environment attitudes before participating in an environmental education program. After the environmental education program, students were given a post-test to evaluate the changes in their environmental attitudes. The students had a positive change in environmental attitude and became more environmentally conscious of their actions because of the program. After a two-year period, students were given the test again to determine if the positive environmental attitudes had remained. It was found that the students still had positive environmental attitudes.

In another study, Shepard and Speelman (1985-86) investigated participation in an outdoor education program as it related to the environmental attitudes of elementary school age children. In this study, the outdoor education program had very little effect on the students' environmental attitudes.

According to the research, children's attitudes are formed based on the attitudes of significant others in an individual's life as well as his or her life experiences. This research also shows that life experiences impact attitude formation more than any other influence. Therefore, exposure to the natural environment may influence the formation of environmental attitudes. The purpose for investigating environmental attitudes is to determine how to increase positive environmental attitudes in individuals. With positive environmental attitudes, individuals may participate in more environmentally conscious activities in an effort to take care of our world.

Exposure to and Knowledge of the Natural Environment at Varying Age Levels

The exposure to, and knowledge of, the natural environment has been studied in adults more than in children. Most of the studies focus on the knowledge acquired from some type of environmental education program or outdoor recreation experience. The exposure to the natural environment refers to an individual's routine contact with the natural environment (Castle, 1996) and his or her involvement in environmental movement activities, such as the disposal of yard waste and recycling of materials. Knowledge of the natural environment includes having a better understanding of the concepts of interdependence between humans and nature (Dresner & Gill, 1984). The following studies emphasize the differences in the exposure to, and the knowledge of, the natural environment among teenagers and children.

Gillett, Thomas, Shok, and McLaughin (1991) attempted to increase environmental knowledge and influence environmental attitudes through a wilderness program for high school seniors. Through this program, students became more environmentally aware and were able to increase their knowledge of environmental issues. Environmental attitudes among the students also increased from the program.

In a similar study, Dresner and Gill (1984) investigated middle school students' knowledge to the natural environment after a similar wilderness program. In attempts to increase exposure to the natural environment, students were taught and used various survival techniques in the wilderness. After the program, the students' awareness of the natural environment did increase. Students were much more enthusiastic about outdoor activities than they were before the experience.

Frances, Boyes, Qualter and Stanisstreet (1993) investigated elementary students', ages 8 to 12, knowledge about reducing the "Greenhouse Effect". It was found that children could distinguish between major environmental problems, such as global warming and ozone layer depletion, but could not separate mentally the mechanics involved in these problems.

Strickland, Robertson, Jettinghoff, and Diener (1983/84) implemented an energy education program with preschool children. The objective was to see if the children could acquire knowledge about energy and its effects on the natural environment from the program. After the program, the children did show an increase in knowledge about energy and its effects on the natural environment.

Castle (1996) evaluated the relationship between environmental exposure and environmental attitudes in second grade children. She found that children were willing to participate in the natural environment regardless of previous exposure to it. She suggested that more research is needed in this area.

In many of these studies, exposure to and knowledge of the natural environment was investigated in relation to environmental attitudes. According to Cohen (1992), the earlier children experience and value their natural environment, the deeper and more enduring their ability will be for perceiving and experiencing a relationship with and dependency upon nature. Therefore, exposure to the natural environment may influence environmental attitudes.

Age as a Variable in Environmental Studies

Differences across age groups have also been found. When investigating differences, researchers have attempted to establish how to obtain positive

environmental attitudes at every age level. Research in this area is just beginning to be conducted.

Szagun and Mesenholl (1993) investigated differences between teenagers, 12 to 18 years of age. They found the 15- and 18-year-old students did not tend to enjoy nature activities as much as the 12-year-old students. Twelve-year-old students tend to have more positive attitudes toward the natural environment than the 15- and 18-year-old students. Adolescents from all age groups believed environmental destruction was the most unacceptable behavior because it damaged the ecosystems and acts of destruction are immoral.

Higher levels of concern about the natural environment are held by teens than by adults (McTeer, 1978). Children have a higher level of concern than teenagers and adults (Kellert, 1985). Therefore, age is an important variable when examining environmental attitudes.

Summary

From this review of literature, it can be argued that attitudes form in early childhood and that attitude formation is correlated to direct experiences. Environmental education programs influence school aged students in attaining a better awareness of the natural environment, but often these programs do not affect changes in their environmental attitudes. In elementary school students, only half of the programs are successful at impacting environmental attitudes. Some environmental education programs lack the direct experience which is often necessary in forming and changing attitudes (Regan & Fazio, 1977).

There has been only one other study conducted which relates exposure to the natural environment in young children to any variable (Castle, 1996). Research to evaluate the relationship between young children's exposure to the natural environment and their environmental attitudes is limited. Children under seven have not been subjects for research of environmental attitudes. This limited amount of research demonstrates the need for research in this area.

Chapter 3

METHODOLOGY

Research Design

This was a cross sectional, quasi-experimental, exploratory research study. It was conducted in suburban area child care centers, preschools, after school care centers and elementary schools in Michigan. The purpose of this study was to investigate the relationship of children's exposure to the natural environment to their environmental attitudes. The unit of analysis for this study was individual children ages 4, 7, and 10 years of age. Children were combined into three groups according to age.

Subjects

Families from many different suburban area child care centers, preschool programs, after school care centers and elementary schools in Michigan were asked to participate. The subjects of this study were 34 four-year-old children, 22 seven-year-old children, and 29 ten-year-old children and their parents (mother or father or other primary caregiver). There were a total of 83 families that participated. Two families had two children in the age groups identified. Therefore there were 85 children that participated in the study. There were 52 girls and 33 boys.

The mean age of the parents was 38 years. Eighty-five percent of the fathers and 84% of the mothers had attended college. Of those who had attended college, 61% percent of the fathers and 57% of the mothers had graduated with a Bachelor's degree or higher. The remainder of the parents had completed high school.

Over three quarters of the 83 families (77%) lived in a suburban community. Eleven percent lived in a rural (farm or non-farm) community and 11% lived in an urban community. Two percent did not respond.

Information about the grandparents was also collected. Seventy-one percent of the maternal grandparents and fifty-five percent of the paternal grandparents lived in a suburban community. Five percent of the children visited their maternal grandparents daily. Three percent of the children visited their paternal grandparents daily. Since the majority of the grandparents lived in a suburban community, and the majority of the children did not visit their grandparents regularly, it was concluded that these results were not related to the children's amount of exposure to the natural environment. Therefore they were excluded from the analysis. Table 1 contains the demographic information in each age group.

Table 1

Demographics Within Age Groups

Variable	four-year-old		seven-year-old		ten-year-old	
	number	%	number	%	number	%
Number of Children	34	40%	22	26%	29	34%
Gender of Child						
Male						
Female						
Age of Parents						
18-29	1	1%	1	1%	2	2%
30-39	18	21%	12	15%	16	19%
40-49	15	18%	8	9%	10	12%
50-59					1	1%
Mother's Education Level						
Some High School	2	2%				
High School Diploma	1	1%	5	6%	6	7%
Some College Courses	1	1%	3	4%	4	5%
Associate's Degree	16	19%	3	4%	10	12%
Bachelor's Degree	5	6%	6	7%	6	7%
Master's Degree	8	9%	2	2%	1	1%
Ph.D., M.D. or other	8	9%	3	4%	2	2%
Father's Education Level						
Some High School						
High School Diploma	3	4%	4	5%	6	7%
Some College Courses	3	4%	5	6%	6	7%
Associate's Degree	1	1%	2	2%	3	4%
Bachelor's Degree	10	12%	5	6%	7	8%
Master's Degree	2	2%	3	4%	2	2%
Ph.D., M.D. or other	15	18%	3	4%	5	6%
Parental Income						
$10,000-$19,000						
$20,000-$29,000	1	1%			4	5%
$30,000-$39,000	3	4%				
$40,000-$49,000	8	9%	3	4%	2	2%
$50,000-$59,000	3	4%	3	4%	3	4%
$60,000 or above	3	4%	2	2%	1	1%
No Response	13	15%	11	13%	15	18%

Table 1 (continued)

Variable	four-year-old number	%	seven-year-old number	%	ten-year-old number	%
Place of Residence						
Rural/Farm	1	1%				
Rural/Nonfarm	3	4%			2	2%
Suburban	21	25%	22	26%	22	26%
Urban	7	8%			2	2%
No Response						
Area of School						
East Lansing; Child Dev. Laboratories	23	27%				
East Lansing	11	13%				
Okemos or Haslett			10	12%	21	25%
Walled Lake			11	13%	8	9%

Instrumentation

Two different measurement tools were used in this research. The first survey was given to parents to gain demographic information about the family and to assess their child's exposure to the natural environment (Appendix D, Parent Survey). The second survey, called the Children's Environmental Response Inventory Adapted (CERIA), was given to the children in the study to evaluate their environmental attitudes (Appendix D).

Exposure To The Natural Environment

The Parent Survey (PS) was used to measure the children's exposure to the natural environment (Appendix D). Created for this study, the Parent Survey (PS)

elicited information about each child's past experiences with the environment, vegetation, parks, beaches, and camping. The thirty multiple choice and fill-in-the-blank questions were designed to evaluate how much exposure each child had in the natural environment.

The first 15 questions were used to determined each child's exposure to the natural environment. An environmental exposure score was calculated for each child based on his or her parent's response to the survey questions. Three points were given to a "high exposure" response. These responses included often being involved in planting vegetables and flowers, often participating in recycling and composting activities, often playing outdoors, and often spending time at the park, the beach, as well as camping. Two points were given to a "medium exposure" response. These responses included occasionally being involved in planting vegetables and flowers, occasionally participating in recycling and composing materials, occasionally playing outdoors, and occasionally spending time at the park, the beach, and camping. One point was given to a "low exposure" response. These responses included rarely planting vegetables and flowers, rarely recycling or composting materials, rarely playing outdoors, and rarely spending time at the park, the beach, and camping. There were zero points given to a "no exposure" response. These responses included never planting vegetables or flowers, never recycling or composting materials, never playing outdoors, and never spending time at the park, the beach, and camping.

The Parent Survey (PS) was created by the primary researcher (Appendix D). The question and response scale from the survey were shared with a panel of child

development experts. These experts concurred the test contained content validity. A reliability test was conducted. This survey had a Cronbach's α of .53 which was judged acceptable for this study.

Environmental Attitudes

The second survey was given to the children. An adapted version of the "Children's Environmental Response Inventory" (CERI), developed by Bunting & Cousins (1983, 1985), was used to measure children's environmental attitudes. This instrument was adapted to be suitable and less abstract for the younger children in this investigation. The adapted version was called the "Children's Environmental Response Adapted" (CERIA, Appendix D). The survey was narrowed down to 15 questions instead of twenty-two. This was done to make the length more reasonable for the younger children. It was administered on a one-on-one basis by the primary investigator of this research project. The children were shown pictures (Karp, 1987; Hill, 1977; & Turner, 1991) of the natural environment and asked how much they liked to do the activity in the pictures. This helped the children visualize the questions being asked.

The children responded to the CERIA questions using a five point Likert scale. This Likert scale consisted of the five different sized dots representing how much the children liked the images in the picture shown to them for each question. Children were to point to the dot which represented how much they liked to do the activity in each picture. Figure 2 displays this response scale.

Do not like at all | Do not like it | Neither like nor dislike | like a little | like a lot

Figure 2: CERIA Response Survey

Children were tested at their child care center, preschool, after-school care center, or elementary schools. Each child was told about the project and asked if he/she wanted to participate. The CERIA (Appendix D) took about 5 minutes for each child to complete. When tested, each child was given the following instructions:

> Hello, my name is Ms. _____. I have some pictures of outdoor places I'd like to show you. I'm going to show you 15 pictures and you can tell me how much you like what is in the picture. If you like the picture a lot you can point the largest circle on this page. If you like the picture a little you can point to the next smaller circle. If you neither like nor dislike the picture can point to the middle circle. If you do not like the picture you can point to the next smaller circle and if you really do not like the picture at all you can point to the smallest circle.

The CERI survey was found to be "statistically robust....[with] Cronbach's α....ranges from .78 to .91" (Bunting and Cousins, 1985). The pictures, questions, and response scale used in this adapted test were shared with a panel of experts

who know about children and nature. These experts determined the survey to contained content validity. The survey was determined to be reliable, with a Cronbach's $\propto$ of .70.

Procedure

At child care centers, preschool programs, and after-school child care centers, the director of the program was contacted to give approval for his or her center to be involved. The principal, assistant superintendent of schools, or the director of instruction was contacted for approval for the elementary schools in his or her area to be involved. Once approval was obtained, the researcher was able to proceed based on the policies of each location.

In each location, the researcher sent an information letter (Appendix A) and a permission slip (Appendix C) to each family who had a child who was four years old, seven years old, and/or ten years of age. Both parent and child consent were required for the family to be involved in the study (Appendix C). Once permission slips were returned, the Parent Survey (PS), was sent to the parents to be filled out (Appendix D). Once the parents completed the survey and returned it to the primary investigator, their involvement in this study was complete. After giving the parents two weeks to respond, dates were set to work with the children on site at their school or child care center. The testing of the children's environmental attitudes occurred within 4 to 6 weeks after contact with the parents.

Rater reliability was assured by the primary investigator of this project. There was only one adult involved in the distribution and administration of the measurement tools to parents and children. The PS (Appendix D) was sent home

with the children, self-administered at home, and sent back to primary investigator for scoring. The CERIA (Appendix D) was administered to the children on a one-on-one basis by the primary investigator at the school they attended.

When surveying the children, each question was asked the same way. See Appendix D. If a child seemed confused the question was reworded to assist him or her to understand it. The children either pointed to the appropriate circle or verbally answered the question. When they verbally answered the question the investigator asked them to point to the appropriate circle which matched their response.

The permission slips (Appendix C), PS (Appendix D), and CERIA (Appendix D) were coded with an identification number (1-85) and kept separate from each other. This system allowed data to be analyzed without the family being identified by name and assured confidentiality of the families.

When each child completed the CERIA (Appendix D), he or she was thanked and returned to his or her classroom. Teachers, schools, and centers were also thanked. The parents who participated were thanked and assured confidentiality of all participants. They also were given the opportunity to contact the primary investigator by telephone with any questions they had. A summary of the conclusions was given to each school and/or center.

The process of gaining approval from the schools, obtaining subjects, collecting data from parents and children, and scoring the data took about nine months.

Research Questions

The following research questions were investigated:

Question 1: Does children's exposure to the natural environment vary at different age levels?

Question 2: Do children's environmental attitudes vary at different age levels?

Question 3: How does children's exposure to the natural environment relate to their environmental attitudes?

Question 4: Does the relationship between children's exposure to the natural environment and their environmental attitudes vary at different age levels?

Decision Rule: Alpha was set at .05.

Data Analysis

Age and Exposure to the Natural Environment

The data collected for this study was used first to assess children's exposure to the natural environment at varying age levels. The PS was used to assess the children's exposure to the natural environment (Appendix D). A total environmental exposure score was assigned to each child based on the parent's responses. To assess children's environmental exposure at varying age levels a one-way analysis of variance (ANOVA) was used with age being the independent variable and exposure to the natural environment being the dependent variable.

Age and Environmental Attitudes

Children's responses on the CERIA (Appendix D) were classified into five categories ranging from 1= Do Not Like at All to 5= Like a Lot. A total

environmental attitudes' score was assigned to each child. To analyze children's environmental attitudes at varying age levels, a one-way ANOVA was used with age being the independent variable and environmental attitudes being the dependent variable.

Environmental Exposure and Environmental Attitudes

To determine if a relationship existed between children's exposure to the natural environment and their environmental attitudes, the scores from the surveys were analyzed using Pearson correlation coefficients, with exposure to the natural environment being the independent variable and environmental attitudes being the dependent variable. Individual correlations were also analyzed between each individual question on each survey using Pearson correlation coefficients as well.

Environmental Attitudes and Exposure to the Natural Environment at Varying Age Levels

To determine if a relationship existed between children's exposure to the natural environment and children's environmental attitudes at different age levels, a 2x3 simple factorial ANOVA was used with age (4,7,10) and exposure to the natural environment (High and Low) being independent variables and environmental attitudes being the dependent variable. Means of each age group were also calculated.

The statistical package used to analyze the data was SPSS for Windows 6.1 (1996). The next chapter contains the results.

CHAPTER 4

RESULTS

This chapter is devoted to the results of the study. It is organized by research question in the order that they are presented in Chapter 3.

Research Questions

Question 1:

Does children's exposure to the natural environment vary at different age levels?

Children's exposure to the natural environment was assessed using the information collected in the Parent Survey (PS, Appendix D). A one-way ANOVA was performed to analyze this question. It was found that children's exposure to the natural environment does not vary at different age levels. See Table 2. Gender, socioeconomic status, education level of the parents, age of the parents, and the place of residence were all evaluated as well. Differences based on gender of the children or any of the demographic information were not found.

When examining the mean scores for the groups it was found that the 7-year-old group had a slightly higher mean score ($\bar{x}$ = 34.41) than the 4- and 10-year-old groups ($\bar{x}$ = 33.44 and 33.62, respectively). See Table 3.

Table 2

Results of a One-Way Analysis of Variance for Age Differences in Exposure to the Natural Environment

Source of Variation	df	Sum of Squares	Mean Squares	F-Statistic	Level of Probability
Between Groups	2	13.28	6.64	.33	.72
Within Groups	82	1668.53	20.35		
Total	84	1681.81			

Table 3

Means and Standard Deviations of the Exposure to the Natural Environment Scores Based on Age

Age Group	Mean	Standard Deviation	N
4-year-olds	33.44	3.69	34
7-year-olds	34.41	5.04	22
10-year-olds	33.62	4.95	29

Question 2:

Does children's environmental attitudes vary at different age levels?

Children's environmental attitude was assess using the CERIA (Appendix D). A one-way ANOVA was used in the analysis of this question. It was found that children's environmental attitudes do vary at different age levels ($p < .05$). See Table 4. This relationship indicated a significant difference in the 7-year-old mean score. The 4-year-old group ($\bar{x} = 62.44$) and the 10-year-old group ($\bar{x} = 62.90$) had similar environmental attitude mean scores while the 7-year-old group ($\bar{x} = 67.00$) had a significantly higher environmental attitude mean score. See Table 5. The mean scores within the seven-year-old population were compared to evaluate significance. Significant differences found based on the location of the subjects were not found. Environmental attitudes were correlated to the gender of the children to establish gender differences. Differences related to gender were not found.

Environmental attitudes were also correlated with the demographic information to establish differences in socioeconomic status, education level of the parents, age of the parents, and the place of residence. Differences according to demographic information were not found either.

Table 4

Results of a One-Way Analysis of Variance for Age Differences in Environmental Attitudes

Source of Variation	df	Sum of Squares	Mean Squares	F-Statistic	Level of Probability
Between Groups	**2**	**311.68**	**155.84**	3.13	.05*
Within Groups	82	4087.07	49.84		
Total	84	4398.75			

*p< .05

Table 5

Means and Standard Deviations of Environmental Attitude Scores Based on Age

Age Group	Mean	Standard Deviation	N
4-year-olds	62.44	7.71	34
7-year-olds	67.00	7.02	22
10-year-olds	62.90	6.24	29

Question 3:

How does children's exposure to the natural environment relate to their environmental attitudes?

Pearson correlation coefficients were performed to analyze the children's exposure to the natural environment with their environmental attitudes. The Pearson correlation coefficient for the total scores was .243 ($p < .05$). There was not an overall significant relationship between children's exposure to the natural environment and their environmental attitudes.

Individual questions on each survey were also correlated. There were positive significant relationships found between families that recycle and children's positive reaction to the pictures of the colored leaves, the house in the woods, the forest, camping. There were also positive significant relationships between the children who participated in recycling and composting and their positive reactions to the pictures of the path in the woods and camping.

There was a positive significant relationship between families that go camping and children's response to the picture of camping. There was also positive a significant relationship between children's enjoyment of camping and their response to the camping picture, while there was a negatively significant relationship between children's response to the picture of the snow.

There was a negatively significant relationship between children who enjoyed playing outside and their response to the picture of the mud, while there was a

positive significant relationship between children who enjoy playing outside and their response to the picture of the beach. There was a negative significant relationship between the families that go to the park and children's response to the picture of the sunrise. See Table 6.

Table 6

Intercorrelations Between Child Exposure Items and Child Attitudinal Items

Exposure Variable	$\bar{x}$[a]									
Attitudinal Variable		Path in Woods	Colored Leaves	Mud	Sun Rise	House in Woods	Forest	Camping	Beach	Snow
Child Plants Vegetables & Flowers	1.9	—	—	—	—	—	—	—	—	—
Family Composts	1.2	—	—	—	—	—	—	—	—	—
Family Recycles	2.6	—	.24*	—	—	.22*	.31*	.37**	—	—
Child Composts and Recycles	1.8	.27*	—	—	—	—	—	.23*	—	—
Child Plays Outside	3.0	—	—	-.24*	—	—	—	—	.26*	—
Child Enjoys Playing Outside	3.0	—	—	—	—	—	—	—	—	—
Child Enjoys Games Outside	2.6	—	—	—	—	—	—	—	—	—

*p<.05 **p<.01

a = range - 0 = no exposure, to 3 = high exposure

Table 6 (continued)

Exposure Variable	$\hat{x}$[a]									
Attitudinal Variable		Path in Woods	Colored Leaves	Mud	Sun Rise	House in Woods	Forest	Camping	Beach	Snow
Child Enjoys Using Tools Outside	2.3	———	———	———	———	———	———	———	———	———
Child Enjoys Observing Outside	2.4	———	———	———	———	———	———	———	———	———
Family Goes to the Park	2.3	———	———	———	.22*	———	———	———	———	———
Child Enjoys the Park	2.9	———	———	———	———	———	———	———	———	———
Family Goes to Beach	2.1	———	———	———	———	———	———	———	———	———

*p<.05 **p<.01

a = range - 0 = no exposure, to 3 = high exposure

Table 6 (continued)

Exposure Variable	$\bar{x}$[a]									
Attitudinal Variable		Path in Woods	Colored Leaves	Mud	Sun Rise	House in Woods	Forest	Camping	Beach	Snow
Child Enjoys Going to the Beach	3.0	——	——	——	——	——	——	——	——	——
Family Goes Camping	1.1	——	——	——	——	——	——	.31*	——	——
Child Enjoys Camping	1.8	——	——	——	——	——	——	.26*	——	-.24*

*p<.05 **p<.01

a = range - 0 = no exposure, to 3 = high exposure

Question 4:

How does the relationship between children's exposure to the natural environment and their environmental attitudes vary at different age levels?

The scores from the third question were used in this question as well. Age was factored into the analysis to see if there were any differences between the groups. A 2x3 simple factorial ANOVA was performed for this question. It was found that children's exposure to the natural environment as it relates to their environmental attitudes does not vary at different age levels. See Table 7.

In the 4-year-old group, it was found that the children with a low exposure level had a more positive environmental attitude mean score ($\bar{x}$ = 63.15) than the children with a high exposure level ($\hat{x}$ = 61.43). The 7-year-old children's mean score ($\tilde{x}$ = 65.43 and 67.73) for the relationship environmental attitudes was higher than the 4- ($\tilde{x}$ = 63.15 and 61.43) and 10-year-old ($\bar{x}$ = 61.40 and 64.50) children's environmental attitude mean scores for both levels of exposure. See Table 8.

Then the researcher examined the range of the exposure to the natural environment variable and of the environmental attitudes variable. It was found that 4-year-old children in this study had a larger range of scores for both variables.

The relationship between children's exposure to the natural environment and their environmental attitudes was correlated with the gender of the children, their socioeconomic status, the education level of their parent, age of their parents, and the place of residence. Significant relationships among the demographic information were not found.

Table 7

Results of a 2x3 Simple Factorial Analysis of Variance for Age and Exposure to the Natural Environment Effects on Environmental Attitudes

Source of Variation	df	Sum of Squares	Mean Squares	F-Statistic	Level of Probability
Main Effects					
Age (A)	3	330.02	110.01	2.19	.10
Exposure (E)	2	311.68	155.84	3.10	.06
A and E	2	101.00	50.50	1.01	.14
Total	84	4398.75	52.37		

Table 8

Mean and Standard Deviation of the Relationship between Exposure to the Natural Environment and Environmental Attitudes on Age

	Age		
Exposure Level	4-years-old	7-years-old	10-years-old
Low			
Range 21 to 33			
M (x = 30.28)	63.15	65.43	61.40
SD (SD = 3.08)	7.00	9.00	7.00
High			
Range 34 to 44			
M (x = 37.14)	61.43	67.73	64.50
SD (SD = 2.65)	9.00	6.00	6.00

A summary table of the findings for each research question was also created. See Table 9.

Table 9

Summary of the Findings

Question	Instrument(s)	Analysis	Findings
Question 1: Does children's exposure to the natural environment vary at different age levels?	Parent Survey	One-Way ANOVA	1. Exposure to the natural environment does not vary at different age levels. 2. Seven-year-old children's exposure to the natural environment mean scores were slightly were slightly higher than the 4- and 10-year-old children's mean scores. 3. Demographic information was also analyzed. No significant differences were found.
Question2: Does children's environmental attitudes vary at different age levels?	Children's Environmental	Mean Scores One-Way ANOVA	1. Environmental attitudes do vary at different age levels ($p>.05$) 2. The difference was the seven-year-old children's environmental attitude mean scores, which was higher than the 4- and 10-year-old groups' mean score. 3. Demographic information was also analyzed. No significant relationships were found.

Table 9 (continued)

Question	Instrument(s)	Analysis	Findings
Question 3: How does children's exposure to the natural environment relate to their environmental attitudes?	Parent Survey and CERIA	Pearson Correlation Coefficient	1. No overall significant relationship was found. 2. Individual questions were correlated; significant relationships are exhibited in Table 10.
Question 4: How does the relationship between children's exposure to the natural environment and their environmental attitudes vary at different age level?	PS & CERIA	2x3 simple factorial ANOVA mean scores	1. No difference was between the age groups. 2. Four-year-old children with lower levels of exposure to the natural environment had more positive environmental attitudes. Four-year-old children with higher levels of exposure to the natural environment had more negative environmental attitudes. 3. Seven-year-old children's mean score for their environmental attitudes was higher in both categories than in the 4- and 10-year-old groups.

A summary of items from the Parent Survey indicating exposure to the natural environment or environmentally conscious activities and significant children's attitudinal responses are illustrated in Table 10.

Table 10

Significant Relationships between Surveys

Exposure Event	Picture Eliciting Attitudinal Preference
Family Recycles	Colored leaves House in the Woods Forest Camping
Child Recycles and Composts	Path in the Woods Camping
Child Plays Outside	Negative relationship to Mud Beach
Family Goes to the Park	Sunrise
Family Goes Camping	Camping
Children Enjoy Camping	Camping Negative relationship to snow

The next chapter is devoted to the explanation of the findings, personal observations and suggestions for future research.

Chapter 5

DISCUSSION AND DIRECTIONS FOR FURTHER RESEARCH

Discussion

This chapter is devoted to the findings. Personal observations will also be evaluated along with the implications for practitioners and future researchers.

Age and Exposure to the Natural Environment

In the sample of children studied, it was found that children's exposure to the natural environment did not vary significantly at different age levels. Considering parents were asked to evaluate the time their children spend outdoors and in family-related outdoor activities, it may be that parental patterns of participation in outdoor activities and time spent outdoors with their children remain the same throughout their children's younger years.

It was found that the exposure to the natural environment mean score ($\bar{x}$ = 34.41) for the seven-year-old children was slightly higher, but not significantly higher, than the 4- and 10-year-old mean scores ($\bar{x}$ = 33.44 and 33.62, respectively). When comparing this to the score distribution, it was found that the 7- and 10-year-old children had similar amounts of exposure to the natural environment even though the 7-year-old mean score was higher. It may be that 7- and 10-year-old children have similar amounts on exposure to the natural environment. This is supported in research done by Castle (1996), where the majority of the second grade children had a similar amount of exposure to the natural environment.

Based on the 4-year-old children's mean score ($\bar{x}$ = 33.44) and distribution of their scores, it seems that younger children spend slightly less, but not a significant

amount, of time outdoors. When comparing the distribution of scores, the 4-year-old children seemed to have slightly less exposure to the natural environment then the other two groups. It may be that because the 4-year-old children are younger, they may not participate in as many environmental or outdoor activities.

Another possibility may be that since the sample size was smaller for the 7- and 10-year-old groups, these groups may not be as diverse in their responses. It may also be that the parents who chose to participate in family-based outdoor exposure experiences and natural environment activities found this survey important and responded where as other parents did not respond.

Age and Environmental Attitudes

In the sample of children studied, it was found that children's environmental attitudes did vary at different age levels. The relationship that was found seemed to be related to the increase in the environmental attitude mean score ($\tilde{x}$ = 67.00) in the 7-year-old group. Their environmental attitude mean score was higher than the other two groups ($\tilde{x}$= 62.44 and 62.90, respectively). It seems that the 7-year-old children in this study had more positive environmental attitudes than the 4- and 10-year-old children. This finding is contradictory to Harvey's (1989) findings. Harvey (1989) found that older children enjoyed the outdoors more than the younger children.

There are a number of possibilities for these positive environmental attitudes in the 7-year-old children. The first possibility seemed to be that over half of the 7-year-old children attended the same elementary school and this school may have had an environmental education program implemented. To evaluate this possibility, the

researcher compared the total mean scores for the entire seven-year-old group ($\bar{x}$ = 67.00) with the mean scores of the 7-year-old children ($\bar{x}$ = 69.00) from the same school. It was found that there were not any significant differences in the mean scores. Even if the school did have an environmental education program implemented, this is not the reason for the higher mean scores of the 7-year-old group.

The second possibility seemed to be the low number of 7-year-old children in the study. This population may not have been diverse enough because of its size and similar place of residence. With a larger, more diverse sample the differences may be clearer.

The third possibility may be related to the development of the seven-year-old children. According to Piaget (Thomas, 1992), developmentally seven-year-old children are transitioning between the preoperational thought period and the concrete operational thought period. During concrete operations, children are capable of imagining the places in the pictures more readily than the younger children. In the early transitional time period, children are aided by viewing the actual objects or pictures of the object (Thomas, 1992).

Seven-year-old children still interact with and depend upon parents greatly. At ten years old, children are beginning to be more interested in peer interaction than family (Thomas, 1992). Since the questions asked were related to family activities, the older children may have enjoyed the activities in the pictures but would rather be with their friends than their parents.

When correlating environmental attitudes to gender, it was found that there was not a significant difference between boys and girls in this study. This is contradictory to the results found by Harvey (1989). She had found girls' attitudes to be more positive than boys' attitudes.

Exposure to the Natural Environment and Environmental Attitudes

When evaluating the relationship between children's exposure to the natural environment and their environmental attitudes, it was found that there was not a significant relationship overall. This is a contradiction to Harvey's (1989) findings. Harvey (1989) found that previous experience in the natural environment influenced environmental attitudes positively. She examined children ages 8 to 11. She evaluated the children's past direct experience to the natural environment and correlated it to their environmental attitudes. Harvey (1989) used the CERI created by Bunting and Cousins (1983) to evaluate the children's environmental attitudes.

However, when correlating the individual question scores from each survey, some relationships were found. It was found that families who participate in recycling have children who responded more positively to pictures of the colored leaves, the house in the woods, the forest, camping. It was also found that children who participate in recycling and composting materials responded positively to pictures of the path in the woods and camping. It seemed to be that families who actively participate in environmentally conscious activities have positive environmental attitudes which influence the formation of their children's environmental attitudes more positively than those who do not participate in such activities. It also seemed to be that children who participate in environmentally conscious activities have more

positive environmental attitudes than those who do not participate in such activities. This was supported in the Hines, Hungerford, and Tomera (1987) research which found that individuals who act responsibly toward the environment have positive environmental attitudes. Malkus and Musser (1994) also support this finding. They found that children's, ages 8 to 12, environmental attitudes related to their environmental behavior. These environmentally conscious activities work toward protecting and preserving the natural physical/biological environment through reducing the waste and pollution in the air, water, and land. This waste and pollution is part of the human built environment (Sontag & Bubolz, 1993).

A significant relationship was found between children who play outdoors and those who liked the picture of the beach. This may be because in Michigan it is mild to cold most of the year, and these children may prefer to play in a warmer weather, similar to that typically thought of when shown a picture of the beach. When children saw the picture of the beach, they may have thought of warm temperatures and spending time outdoors near the water to play in.

Another significant relationship found was in the families that went to the park and those who liked the picture of the sun rise. Given this relationship, it may be that families that visit the park may not visit other outdoor areas that are away from their home or participate in other outdoor activities that often; therefore, their children may not participate in many other outdoor activities away from their home. They may have had an opportunity to observe the sun rise from their home, though. This could be an activity they enjoy doing. These children also may enjoy getting up early to see the sun rise with their parents, especially if the parents leave for

work early and return late at night. This possibility is also based on some of the verbal responses given to the researcher when showing the children the pictures. Some children had commented on enjoying seeing the sunrise in the morning with their parents.

It was found that of the families that have been camping together, their children really liked the picture of the family camping. It seems that children who have experienced a camping expedition with their families have really enjoyed it.

It was difficult to make conclusions about the negative relationships that were found. Significant relationships were found in children who play outside and responded negatively to the picture of the mud. Since children are often strongly discouraged from playing in the mud, it may be that they still enjoy playing outside but they do not like to play in the mud or it may seem wrong to the children to enjoy playing in the mud.

Another significant relationship was with children who enjoy camping and responded negatively to the picture of the snow. The picture of the snow in the survey given to children did not have any people in it; therefore children may have believed they would have been playing in the snow alone. So it seems to be that children who enjoy camping, may enjoy spending time with their parents and do not enjoy playing in the snow alone as much. It may also be that children prefer the warmer weather of camping than playing outdoors in the cold snow. Again since Michigan has very cold winters, this picture could have elicited thoughts of below freezing days where it is too cold to play outdoors and in the warmer times, children are able to spend more time outdoors.

Another possibility for these negative relationships may be that these pictures are measuring more than the children's attitudes toward playing in the mud or snow. These responses could be part of the child's learned inhibitions (Moran, 1987). According to Freud, parental inclinations are linked to the child's internal and unconscious determinants of his or her preferences (Moran, 1987). These inhibitions could be related to parental response to the stimuli or based on the child's previous experiences. This type of inhibition may be formed during the second or third year of life during the anal period (Thomas, 1992). These activities may invoke the arousal of dangerous impulses to the child and therefore he or she chooses not to participate in these kind of activities (Madison, 1961).

Relationship of Children's Exposure to the Natural Environment and their Environmental Attitudes at Varying Age Levels

It was found that the relationship between children's exposure to the natural environment and their environmental attitudes does not differ with respect to age in the group of children studied. When examining the scores, it was found that the four-year-old children with low levels of exposure ($\bar{x}$ = 30.28) had a higher environmental attitude mean score ($\bar{x}$ = 63.15) than the environmental attitude mean score ($\bar{x}$ = 61.43) of the four-year-old children with higher levels of exposure ($\bar{x}$ = 37.14). It was thought that the 4-year-old children who do not receive as much exposure to the natural environment had more positive environmental attitudes. This may be because younger children may not have as much exposure because of their age, and they require supervision when they are outdoors.

It was found that the 4-year-old children who received higher levels of exposure to the natural environment ($\bar{x}$ = 37.14) had lower environmental attitudes ($\bar{x}$ = 61.43). This may be because the younger children may be restricted more, by parents, outdoors to insure safety. It may also be because of their age they are not physically capable of doing some activities outdoors that look enjoyable to them. This may be especially true if the children have older siblings with greater capability. These younger children may feel left out when playing outdoors.

The environmental attitude mean scores ($\bar{x}$ = 65.43 and 67.73) for the 7-year-old children with low and high exposure levels were higher than either of the 4- ($\bar{x}$ = 63.15 and 61.43) and 10-year-old ($\bar{x}$ = 61.40 and 64.50) children's mean scores. This could be due to the fact that the 7-year-old group was small and limited in diversity. This group was the smallest of the three groups. The majority of the children attended the same school and all of them lived in similar neighborhoods.

The higher mean scores could also be attributed to the developmental level of the 7-year-old children. According to Piaget, (Thomas, 1992) at 7 years old children are transitioning from preoperational thought to concrete thought. Based on these results and the developmental time period of the 7-year-old group, it could be that environmental attitudes can be more strongly influenced at this age level.

Personal Observations

It was extremely difficult to access elementary schools for this project. Many of the school principals, directors of instruction, and assistant superintendents declined to participate in this project because it was not related to reading, writing, or arithmetic. Even after receiving approval from the schools, parent participation was

very low. This could be because there is a low priority of environmental issues in the school systems, as well as among parents. Environmental education does not seem to be a priority in today's educational system. Of the families asked to participate, many may have felt this study was unimportant or did not find the time to fill out the survey. Because of the low participation this research project was very time consuming. It took approximately 9 months to collect the data for this project.

The children responded in a number of different ways to the CERIA. Many quickly pointed to their response and others took their time deciding. Many of the children responded to why they chose a particular answer and others were silent through the whole test. This may be because the primary investigator was a stranger to the children and some were shy individuals, while others were very excited to look at the pictures and to share their experiences.

Implications for Practitioners

Although there is still much to learn about children and nature, adults can begin to make a difference now. Teachers and parents need to promote these positive attitudes throughout childhood through exposure and educating children about the nature world. Children acquire knowledge through experience. Teachers and parents need to involve children in nature related activities. This involvement will give them the experience to gain knowledge about the environment.

According to the findings of this study, it seems to be that families who participate in environmentally conscious activities influence the formation of their children's environmental attitudes. To promote positive environmental attitudes in

children it may be inferred that environmentally conscious activities should be incorporated in the classroom. Examples of these would be to recycle materials used, turning the off lights when not using them to conserve energy, incorporating books about the environment, planting vegetables and other plants, and going on field trips to natural environmental areas such as a wetland areas and/or a nature walk. At the same time, teachers need to explain to children the importance of our interaction in and with the natural environment. According to some of the findings of this study, it may be more beneficial to seven-year-old children to incorporate these activities into the classroom. It seems that this may be an influential age for the development of environmental attitudes. More research is needed in this area to support these findings, however.

Parents should increase the amount of environmentally conscious activities they participate in at home.

Implications for Future Research

The CERIA consisted of 15 pictures of the natural environment. These pictures were chosen to be developmentally appropriate for ages 4 through 10. Some of the pictures seemed to be inappropriate for the older children, such as the pictures of the sandbox play. Since the original CERI was appropriate for ages 9 to adulthood, it may be more effective to use the original for the 10-year-old sample. For the younger children, the CERIA would need to parallel the questions used for the 10-year-old sample in order to compare the groups.

Considering it was difficult to make conclusions about the negative relationships, i.e., children who like to be outside but do not like to the picture of the mud and

children who like to go camping but did not like the picture of the snow, the future researchers may want to interview children to elicit more explanatory responses in these areas. When using this environmental attitudes scale though, future researchers may want to replace the pictures of the mud and the snow so that the scale solely focuses on environmental attitudes and not other inhibitions that may have been developed during the anal period of development.

Although the CERIA was found to be reliable, in contained pictures of places which children may not see very often, if ever. There may have been more diversity among the children's responses if the pictures were related to an outdoor area which was more familiar to themselves, such as a yard, playground, and sports field. This would elicit attitudes regarding the near outdoor environment which may be different than that of the far outdoor environment.

The PS measured the parental assessment of the children's exposure to the natural environment. Children today spend a majority of their time in school or with friends. Parents are not always aware of the time their children spend outdoors when they are not around. Therefore, a corresponding survey to assess the total awareness and knowledge of the natural environment may have given more thorough results.

It also seemed that the surveys used in this study were very similar in content and question responses. In the future, researchers might want to evaluate the parent survey, since the reliability of this scale was acceptable but also borderline. The content may need to be expanded upon in order to receive more diverse answers. It

seemed that in this study the parents and the children were answering the same questions and there were a lot of parallels between them.

Some expansions which could be made would be questions which evaluated other activities the family may participate in, such as a computer used by the children. How much television is watched in the home? How much time does the child spend away from home and where is the child when he/she is not at home? All of these questions would assist in determining the exposure and value of the natural environment in the family.

The sample used in this study was limited in diversity. A more diverse population with respect to socio-economic status, cultural background, age level of the parents, family structure, and education level may create results more representative of the overall population. A comparison of children from urban areas and rural areas would evaluate differences in place of residence as well. Differences have been found in older children in a previous study (Hardy & Fox, 1976).

This study used children's general age and not their exact age. In future research, it will be beneficial to collect the birthdate of the children as well to assess the children's exact age. This would assist in comparing the differences within the groups as well as between groups. With a larger number of children the results may be more significant and generalizable to the overall population.

Conclusion

This study is only the beginning in this area. It was small, but did have some significant findings. Future research needs to focus on the children's awareness and knowledge of the natural environment as it relates to their environmental exposure

and their environmental attitudes. There are a number of different aspects to examine in the research to learn about the depths of the links between children and the natural environment. Further research is needed to gain more knowledge of this intriguing topic.

APPENDIX A

Communication With Schools

Nancy Surbrook
6293 W. Lake Dr.
Haslett, MI 48840

January 14, 1997

Richard Neus
Bennett Woods Elementary School
2650 Bennett Rd.
Okemos, MI 48864

Dear Mr. Neus,

My name is Nancy Surbrook, and I am a graduate student at Michigan State University pursuing a Masters degree in Family and Child Ecology. I am conducting a research study examining young children's exposure to the natural environment and how it affects their environmental attitudes. Most studies that have been conducted have focused on children's attitudes toward the natural environment and on older children in general.

I am looking for children to participate in this study. Participation will involve children four, seven, and eleven years old to answer questions about their attitudes about the environment. Participation consists of approximately 50 seven year old children and 50 ten year old children. The questions will consist of a series of pictures shown to the child. They will then be asked to tell how much they like the picture. The survey questions will take approximately 10 minutes to complete. Participation will also involve sending a survey home to parents to evaluate the exposure to the natural environment of the children.

Attached is an information sheet and a sample permission slip that will be sent to the parents of the children. I can promise you that no one will be forced to participate in this activity if they choose not to. The information gathered from this study will be used for the purposes of this project only, and the confidentiality of all children and parents will be maintained.

I would appreciate your informing me of your decision as soon as possible. I can be reached at 339-6435. If you have any questions, please feel free to contact me.

Thank you for your help.

Sincerely,

Nancy Surbrook

APPENDIX B

Communication with Parents

Appendix B: Communication With Parents

Nancy Surbrook
6293 W. Lake Dr.
Haslett, Mi. 48840

January 13, 1997

Dear Families,

My name is Nancy Surbrook, and I am a graduate student at Michigan State University pursuing a Masters degree in Family and Child Ecology. I am currently investigating young children's exposure to the natural environment and how it affects their environmental attitudes. Some studies that have been conducted have focused on children's attitudes toward the natural environment and on older children in general.

I am looking for children to participate in this study. Participation involves your four year old, seven year old or ten year old child answering questions about their attitudes toward pictures shown to them of the natural environment. They will be asked to tell how much they like the pictures shown to them. The survey questions will take approximately 10 minutes to complete and will be conducted at the school or child care center your child attends. Enclosed is a survey for you to fill out regarding the amount of exposure your child has had to different natural environment areas. You can return this survey by sending it back to school and the permission slip with your child. If you are not interested in participating you do not need to return the permission slip or the survey.

Attached is a permission slip that will give authorization for your child to participate in the activity. I can promise you that no child will be forced to participate in this activity if he/she chooses not to. The information gathered from this study will be used for the purposes of this project only and the confidentiality of all the children will be maintained. Filling out the attached permission slip does not obligate your child to participate in the study. Your child may drop out at any time.

I would be very grateful for your child's cooperation and assistance and for your permission to allow your child to participate. Please take a few moments to fill out the attached permission slip. If you have any questions, please feel free to contact me. Thank you for your help.

Sincerely,

Nancy Surbrook
(517)339-6435

APPENDIX C

Permission Slip

Appendix C: Permission Slip

This study investigates children's exposure to the natural environment and how it affects their environmental attitudes. Your child/ren ages four, seven and/or ten will be asked to answer questions about their attitudes toward pictures shown to them about the natural environment. They will be asked to tell how much they like each picture shown to them. This survey will be conducted at the child's school, preschool and/or child care center. It will be conducted on a one-on-one basis by the primary investigator. The survey questions will take approximately 10 minutes to complete. Parents will also fill a survey out. This survey will be used to determined the amount of exposure your children have had to different natural environment areas. You can fill out this survey and return it back to the school, preschool, or the child care center that you children attend. This survey will take a approximately 5 minutes for you to fill out. Your participation as well as your child/ren's is voluntary and you can discontinue your involvement or your child/ren can discontinue his/her/their participation in this project at any time without explanation and without penalty. All data will be kept confidential by the primary investigator. Only aggregate data will be available to parents, directors, and principals. If you have any questions or concerns concerning participation of yourself or your child/ren fell free to contact me, Nancy Surbrook, at (517) 339-6435.

I/we voluntarily agree to participate in this study and give permission for my/our child/ren to also participate in this study.

_____ _____

Parent Signature Date

_____ _____

Parent Signature Date

_____ _____

Child's Signature Date

_____ _____

Child's Signature Date

APPENDIX D

Instruments

Appendix D: Instruments

PARENT SURVEY

The goal of this survey is to find out the past experiences that young children have with the natural environment. Please indicate your response to the questions below by placing a check mark beside the best answer to each question.

1. How often does your child participate in planting vegetables and/or flowers?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

2. How often does your family participate in composting yard waste?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

3. How often does your family participate in recycling of materials?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

4. How often does your child participate in recycling and/or compost yard waste?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

5. How often does your child play outside?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

6. How much does your child enjoy playing outdoors?
   ( ) Does not enjoy playing outdoors at all
   ( ) Enjoys playing outdoors very little
   ( ) Sometimes enjoys playing outdoors
   ( ) Enjoys playing outdoors often

7. How much does your child enjoy playing games with other children, such as hopscotch and softball, when he/she is outside?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

8. How much does your child enjoy using tools and objects, such as shovels and rakes, when he/she is outside?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

9. How much does your child enjoy observing and actively investigating the physical environment? (Ex. Plants, trees, and flowers)
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

10. How often does your family spend time at a park?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

11. How much does your child enjoy playing at the park?
   ( ) Does not enjoy it at all
   ( ) Enjoys it very little
   ( ) Sometimes enjoys the park
   ( ) Enjoys it a lot of the time

12. How often does your family spend time at the beach?
   ( ) Never
   ( ) Rarely
   ( ) Occasionally
   ( ) Often

13. How much does your child enjoy playing at the beach?
    ( ) Does not enjoy it at all
    ( ) Enjoys it very little
    ( ) Sometimes enjoys the beach
    ( ) Enjoys it a lot of the time

14. How often does your family go camping?
    ( ) Never
    ( ) Rarely
    ( ) Occasionally
    ( ) Often

15. How much does your child enjoy camping?
    ( ) Does not enjoy it at all
    ( ) Enjoys it very little
    ( ) Sometimes enjoys the camping
    ( ) Enjoys it a lot of the time

16. Where do you live in the community?
    ( ) Rural/farm
    ( ) Rural/non-farm
    ( ) Suburban
    ( ) Urban

17. Where do the maternal grandparents live?
    ( ) Rural/farm
    ( ) Rural/non-farm
    ( ) Suburban
    ( ) Urban

18. Where do the paternal grandparents live?
    ( ) Rural/farm
    ( ) Rural/non-farm
    ( ) Suburban
    ( ) Urban

19. How often do your children visit their maternal grandparents?
    ( ) Daily
    ( ) Weekly
    ( ) Monthly
    ( ) Occasionally

20. How often do your children visit their paternal grandparents?
    ( ) Daily
    ( ) Weekly
    ( ) Monthly
    ( ) Occasionally

21. What is your age?

_____

22. What is the age of the other parent of your child?

_____

23. What is the average age of the maternal grandparents?

_____

24. What is the average age of the paternal grandparents?

_____

25. What is your occupation?

_____

26. What is the occupation of the other parent of your child?

_____

27. What is your sex?
    ( ) male
    ( ) female

28. What is your educational level?
    ( ) some high school classes
    ( ) high school diploma
    ( ) some college classes
    ( ) Associate's Degree
    ( ) Bachelor's Degree
    ( ) Master's Degree
    ( ) Ph.D., MD, or other higher education degrees
    ( ) Other_____

29. What is the educational level of the other parent of your child?
    ( ) some high school classes
    ( ) high school diploma
    ( ) some college classes
    ( ) Associate's Degree
    ( ) Bachelor's Degree
    ( ) Master's Degree
    ( ) Ph.D., MD, or other higher education degrees
    ( ) Other_____

30. What is your estimated annual household income?
    ( ) less than $10,000
    ( ) $10,000-$19,000
    ( ) $20,000-$29,000
    ( ) $30,000-$39,000
    ( ) $40,000-$49,000
    ( ) $50,000-$59,000
    ( ) $60,000 and above

Parent Survey Scoring Sheet

The goal of this survey is to find out the past experiences that young children have with the natural environment. Please indicate your response to the questions below by placing a check mark beside the best answer to each question.

1. How often does your child participate in planting vegetables and/or flowers?
   - 0( ) Never
   - 1( ) Rarely
   - 2( ) Occasionally
   - 3( ) Often

2. How often does your family participate in composting yard waste?
   - 0( ) Never
   - 1( ) Rarely
   - 2( ) Occasionally
   - 3( ) Often

3. How often does your family participate in recycling of materials?
   - 0( ) Never
   - 1( ) Rarely
   - 2( ) Occasionally
   - 3( ) Often

4. How often does your child participate in recycling and/or compost yard waste?
   - 0( ) Never
   - 1( ) Rarely
   - 2( ) Occasionally
   - 3( ) Often

5. How often does your child play outside?
   - 0( ) Never
   - 1( ) Rarely
   - 2( ) Occasionally
   - 3( ) Often

6. How much does your child enjoy playing outdoors?
   - 0( ) Does not enjoy playing outdoors at all
   - 1( ) Enjoys playing outdoors very little
   - 2( ) Sometimes enjoys playing outdoors
   - 3( ) Enjoys playing outdoors often

7. How much does your child enjoy playing games with other children, such as hopscotch and softball, when he/she is outside?

0( ) Never
1( ) Rarely
2( ) Occasionally
3( ) Often

8. How much does your child enjoy using tools and objects, such as shovels and rakes, when he/she is outside?

0( ) Never
1( ) Rarely
2( ) Occasionally
3( ) Often

9. How much does your child enjoy observing and/or actively investigating the physical outdoor environment? (Ex. Plants and flowers)

0( ) Never
1( ) Rarely
2( ) Occasionally
3( ) Often

10. How often does your family spend time at a park?

0( ) Never
1( ) Rarely
2( ) Occasionally
3( ) Often

11. How much does your child enjoy playing at the park?

0( ) Does not enjoy it at all
1( ) Enjoys it very little
2( ) Sometimes enjoys the park
3( ) Enjoys it a lot of the time

12. How often does your family spend time at the beach?

0( ) Never
1( ) Rarely
2( ) Occasionally
3( ) Often

13. How much does your child enjoy playing at the beach?

0( ) Does not enjoy it at all
1( ) Enjoys it very little
2( ) Sometimes enjoys the beach
3( ) Enjoys it a lot of the time

14. How often does your family go camping?
    0( ) Never
    1( ) Rarely
    2( ) Occasionally
    3( ) Often

15. How much does your child enjoy camping?
    0( ) Does not enjoy it at all
    1( ) Enjoys it very little
    2( ) Sometimes enjoys the camping
    3( ) Enjoys it a lot of the time

16. Where do you live in the community?
    ( ) Rural/farm
    ( ) Rural/non-farm
    ( ) Suburban
    ( ) Urban

17. Where do the maternal grandparents live?
    ( ) Rural/farm
    ( ) Rural/non-farm
    ( ) Suburban
    ( ) Urban

18. Where do the paternal grandparents live?
    ( ) Rural/farm
    ( ) Rural/non-farm
    ( ) Suburban
    ( ) Urban

19. How often do your children visit their maternal grandparents?
    ( ) Daily
    ( ) Weekly
    ( ) Monthly
    ( ) Occasionally

20. How often do your children visit their paternal grandparents?
    ( ) Daily
    ( ) Weekly
    ( ) Monthly
    ( ) Occasionally

21. What is your age?

_____

22. What is the age of the other parent of your child?

_____

23. What is the average age of the maternal grandparents?

_____

24. What is the average age of the paternal grandparents?

_____

25. What is your occupation?

_____

26. What is the occupation of the other parent of your child?

_____

27. What is your sex?
( ) male
( ) female

28. What is your educational level?
( ) some high school classes
( ) high school diploma
( ) some college classes
( ) Associate's Degree
( ) Bachelor's Degree
( ) Master's Degree
( ) Ph.D., MD, or other higher education degrees
( ) Other_____

29. What is the educational level of the other parent of your child?
( ) some high school classes
( ) high school diploma
( ) some college classes
( ) Associate's Degree
( ) Bachelor's Degree
( ) Master's Degree
( ) Ph.D., MD, or other higher education degrees
( ) Other_____

30 . What is your estimated annual household income?

( ) less than $10,000
( ) $10,000-$19,000
( ) $20,000-$29,000
( ) $30,000-$39,000
( ) $40,000-$49,000
( ) $50,000-$59,000
( ) $60,000 and above

Children's Environmental Response Inventory Adapted

Adapted for younger children from the "Children's Environmental Response Inventory" (CERI) by Bunting and Cousins.

Child's Age:_____

DIRECTION'S FOR ADULT:

This survey tries to find out what young children enjoy in the natural environment around them. There are fifteen items with corresponding pictures in which children are asked to respond. Since many young children cannot read, an adult will work one-on-one with each child. Within each item the adult will define the picture and ask how much the child enjoys the scene. The child will be asked to point to the appropriate dot which represents how much they like the image in the picture. One practice question is provided below for the child to learn about the nature of the questions and how to respond using the different sized dots. The adult giving the survey will use the exact same wording with each child being tested. The entire script is provided below beginning with the next section called "Directions for the Child".

DIRECTIONS FOR THE CHILD:

Hello, My name is Ms./Mr. _____. I have some pictures of different things from the outdoors such as trees and water that I want to show you. When I show you a picture of something I am going to ask you how much you like what is in the picture. You can tell me how much you like the picture by pointing at the dots I have here. If you like what is in the picture a lot you can point to the largest dot (point to the largest dot). If you like the picture a little you can point to the next largest dot (point to the next largest dot). If you neither like nor dislike the picture you can point to the middle dot (point to the middle dot). If you do not like the picture you can point to the small dot (point to the small dot). If you do not like the picture at all you can point to the smallest dot (point to the smallest dot). Show me the dot which means you like the picture a lot. Show me the dot which means you like the picture a little. Show me the dot which means you neither like nor dislike the picture. Show me the dot which means you do not like the picture. Show me the dot that means you do not like the picture at all. Great! You can point to the dot that shows how much you like the picture. Now let's look at some pictures.

PRACTICE QUESTION:

A. This is a picture of a ball.
How would like playing with the ball?
Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
Point to the dot that represents how much you would like to play with this ball.

MEASUREMENT QUESTIONS:

1. This is a picture of a path in the woods where some people like to walk.
How would you like walking in the woods with your family?
Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
Point to the dot you choose.

2. This is a picture of all different colored leaves.
How would you like walking through the leaves?
Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
Point to the dot you choose.

3. This is a picture of some mud.
How would you like to play in the mud?
Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
Point to the dot you choose.

4. This is a picture of the sun rising in the morning.
How would you like to get up early and watch the sun rise?
Would you not like it at all, not like it, neither like it not dislike it, like it a little, or like it a lot?
Point to the dot you choose.

5. This is a picture of a house in the woods where some nice people live.
How would you like living with your family in a house in the woods?
Would you not like it at all, not like it, neither like it not dislike it, like it a little or like it a lot?
Point to the dot you choose.

6. This is a picture of a forest.
   How would you like to play in the forest?
   Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
   Point to the dot you choose.

7. This is a picture of a yard with lots of different plants and trees where some children like to play.
   How would you like playing in this yard?
   Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
   Point to the dot you choose.

8. This is a picture of a family camping in the woods. This is the tent where they sleep.
   How would you like camping in the woods with your family?
   Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
   Point to the dot you choose.

9. This is a picture of a flower garden.
   How would you like to plant flowers?
   Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
   Point to the dot you choose.

10. This is a picture of a sandbox.
    How would you like to play in the sandbox?
    Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
    Point to the dot you choose.

11. This is a picture of a beach.
    How would you like to play at the beach?
    Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
    Point to the dot you choose.

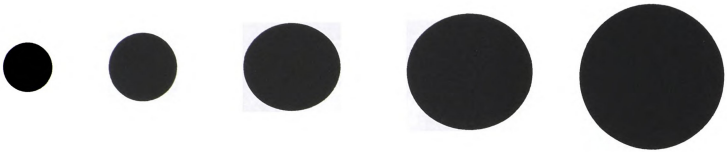
12. This is a picture of some trees.
    How would you like to climb one of these trees?
    Would you not like it at all, not like it, neither like it not dislike it, like it a little or like it a lot?
    Point to the dot you choose.

13. This is a picture of somebody's house in the winter, there is snow all around it.
    How would you like to play in the snow?
    Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
    Point to the dot you choose.

14. This is a picture of ducks in the water.
    How would you like to feed these ducks?
    Would you like it a lot, like it a little, neither like it not dislike it, not like it, or not like it at all?
    Point to the dot you choose.

15. This is a picture of a lake.
    How would you like to go swimming in the lake?
    Would you not like it at all, not like it, neither like it not dislike it, like it a little or like it a lot?
    Point to the dot you choose.

ENVIRONMENTAL ATTITUDES SCORING SHEET



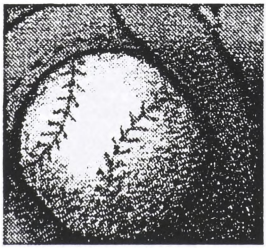
Do not like at all

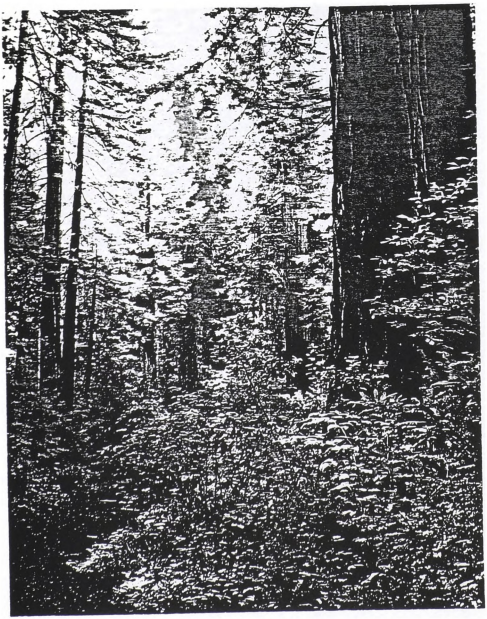
Do not like

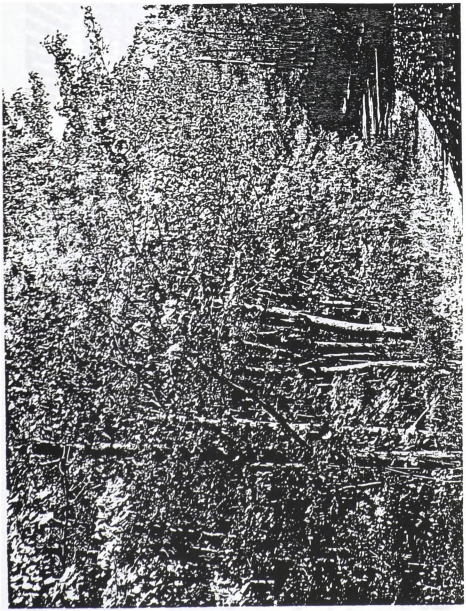
Neither like nor dislike

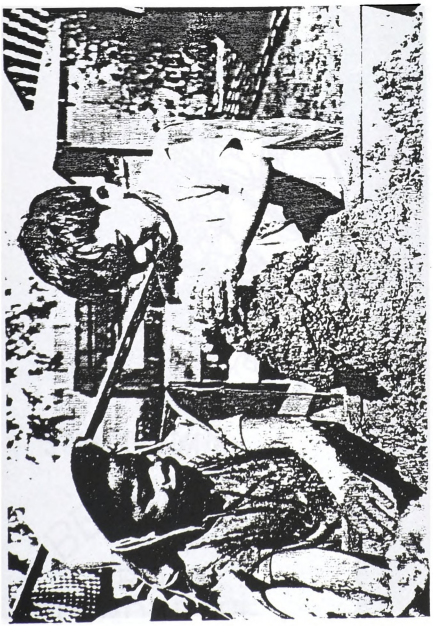
Like a little

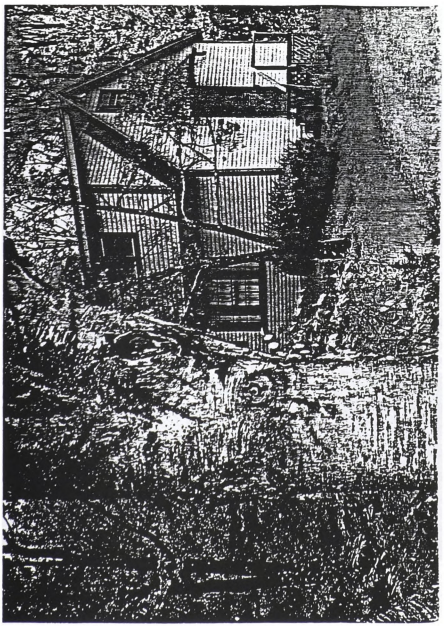
Like a lot

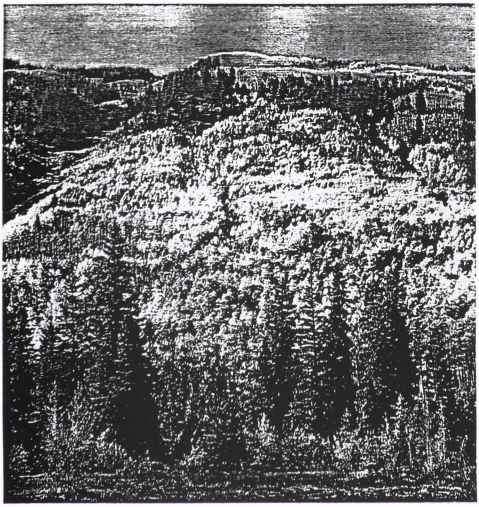


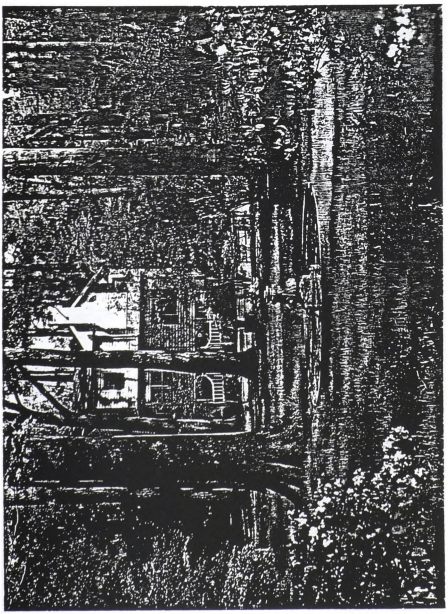


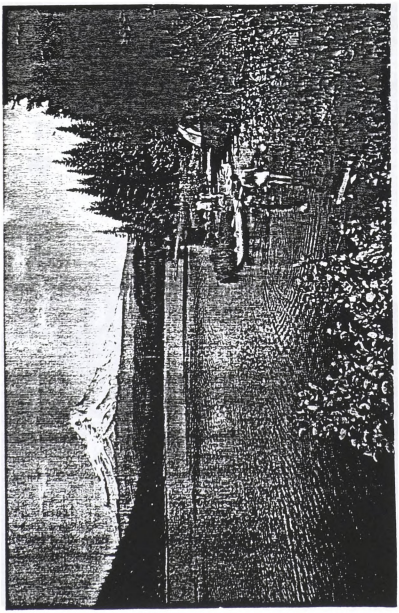


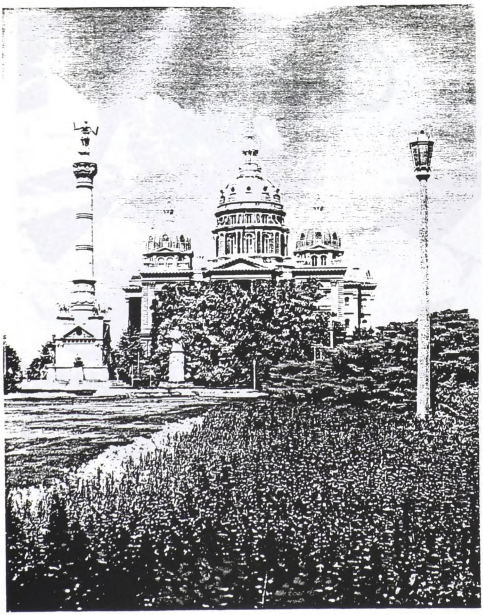


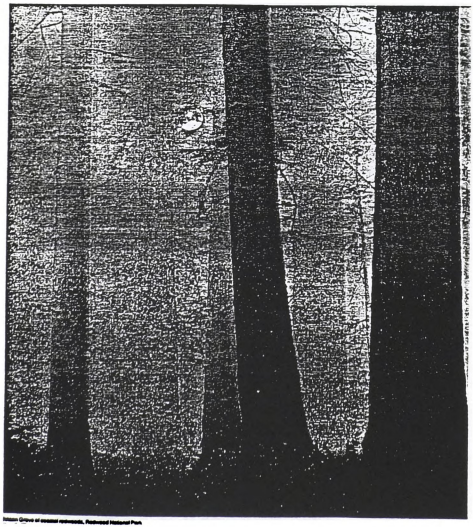




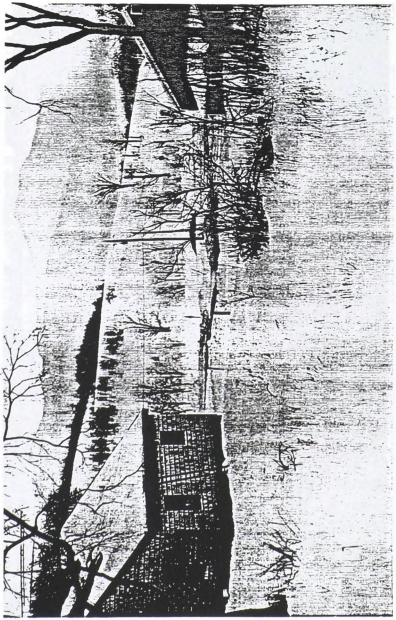


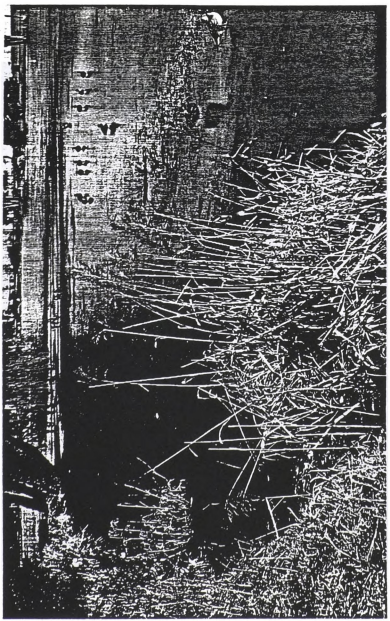


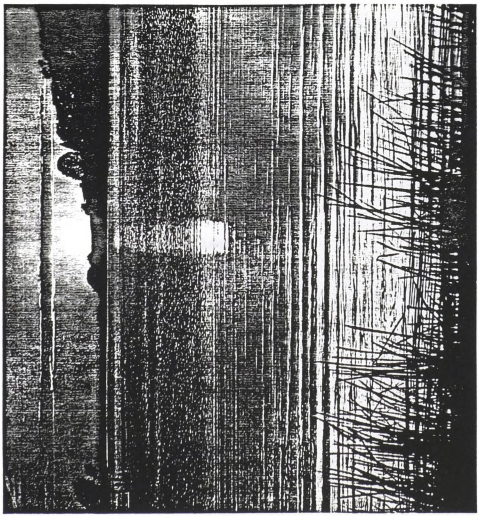




Muir Grove of sequoia redwoods, Redwood National Park.







Appendix E

UCRIHS Approval

Appendix E: UCRIHS Approval

MICHIGAN STATE
UNIVERSITY

June 20, 1996

TO: Nancy A. Surbrook
4464 Janice Lee Dr. Apt. B208
Okemos, MI 48864

RE: IRB#: 96-335
TITLE: CHILDREN'S EXPOSURE TO THE NATURAL ENVIRONMENT AND THEIR ENVIRONMENTAL ATTITUDES
REVISION REQUESTED: N/A
CATEGORY: 1-C
APPROVAL DATE: 06/20/96

The University Committee on Research Involving Human Subjects'(UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project and any revisions listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:bed

cc: Anne Soderman

OFFICE OF
RESEARCH AND GRADUATE STUDIES

University Committee on Research Involving Human Subjects (UCRIHS)

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List of References

List of References

Andrews, M. P., Bubolz, M. M., & Paolucci, B. (1980 Spring/Summer). An Ecological Approach to Study of the Family. Marriage and Family Review, 3, P. 29-49.

Aiken, L. R. (1980). Attitude Measurement and Research. New Directions for Testing and Measurement, 7, p. 1-24.

Babbie, E. (1995). The Practice of Social Research (7^{th} ed.) California: Wadsworth Publishing Co.

Baird, D. (1991, October) Environmental Education: Looking to the Past for Future Direction. Pathways, 3, p. 31-37.

Barnhart, L. (1973). Outdoor Recreation and Environmental Attitudes. Parks and Recreation, p. 48-49 & 70-72.

Bunting, T. E. & Cousins, L. R. (1983). Development and Application of the "Children's Environmental Response Inventory". Journal of Environmental Education, 15, p. 5-10.

Bunting, T. E. & Cousins, L. R. (1985, November) Environmental Dispositions Among School Age Children: A Preliminary Investigation. Environment and Behavior, 17, p. 725-768.

Bunting T. E. & Cousins, L. R. (undated). Children's Environmental Response Inventory. Unpublished Instrument.

Castle, A. (1996). Children's Exposure to the Natural Environment as Related to their Environmental Attitudes Master's Thesis.

Chawla, L. (1988, Fall). Children's Concern for the Natural Environment. Children's Environments Quarterly, 5, p. 13-20.

Cohen, S. (1992). Promoting Ecological Awareness in Children. Childhood Education, 68, p. 358-260.

Dresner, M. & Gill, M. (1984). Environmental Education at Summer Nature Camp. Journal of Environmental Education, 15, p. 35-111.

Frances, C., Boyes, E., Qualter, A. & Stanisstreet, M. (1993). Ideas of Elementary Students about Reducing the "Greenhouse Effect". Science Education, 77, p. 375-392.

Gillett, D. P., Thomas, G. P., Skok, R. L., & McLauglin, T. F. (1991). The Effects of Wilderness Camping and Hiking. Journal of Environmental Education,21, p. 33-44.

Gifford, R., Hay, R., & Boros, K. (1982/1983,). Individual Differences in Environmental Attitudes. Journal of Environmental Education, 14, p. 19-23.

Hardy, C. A. & Fox, N. D. (1976). Environmental Awareness in Rural, Suburban, and Urban Settings. Southern Journal of Educational Research, 10, p. 229-233.

Harvey, M. R. (1989, Spring). Children's Experiences with Vegetation. Children's Environmental Quarterly, 6, p. 36-43.

Hill, D. M. (1977). Mud, Sand, & Water. National Association for the Education of Young Children. p. 18-21.

Hines, J. M., Hungerford, H. R., Tomera, A. N. (1986/87). Analysis and Synthesis of Research on Responsible Environmental Behavior: A Meta-Analysis. Journal of Environmental Education, 18, p. 1-8.

Jaus, H. M. (1984). The Development and Retention of Environmental Attitudes in Elementary School Children. Journal of Environmental Education, 15, p. 33-36.

Karp, M. (1987). America (pp. 25, 139, 157, 199, 227, 243, 265, 277, 297, 324). New York: Portland House.

Kellert, S. R. (1985). Attitudes Toward Animals: Age-Related Development among Children. Journal of Environmental Education, 16, p. 29-39.

Kirby, M. A. (1989, Spring). Nature as Refuge in Children's Environment. Children's Environments Quarterly, 6, p. 7-12.

Kostelnik, M. J., Soderman, A. K., & Whiren, A. P. (1993). Developmentally Appropriate Programs in Early Childhood Education. New York: Macmillan Publishing Co.

Kostka, M. D. (1976). Nature Center Program Impact. Journal of Environmental Education, 7, p. 52-64.

Madison, P. (1961). Freud's Concept of Repression and Defense, Its Theoretical and Observational Language. Minneapolis: University of Minnesota Press.

Malkus, A. J. & Musser, L. M. (1994). The Children's Attitudes Toward the Environmental Scale. Journal of Environmental Education, 25, p. 22-26.

McKechnie, G. E. (1974). ERI Manual. Berkeley: Consulting Psychologists Press.

McKechnie, G. E. (1977). The Environmental Response Inventory is Application, Environment and Behavior, 9. P. 255-276.

McNab, W. L. (1976, November). Sexual Attitude Development in Children and the Parents' Role. The Journal of School Health, 66, p. 537-542.

McTeer, H.J. (1978). Teenage-Adult Differences in Concern for Environmental Problems. Journal of Environmental Education, 9, p. 20-23.

Moran, G. S. (1987). Some Functions of Play and Playfulness: A Developmental Perspective. The Psychological Study of the Child, 42, p. 11-24.

Nabhan, G. P. & Trimble, S. (1994). The Geography of Childhood. Boston, MA: Beacon Press.

Pettus, A. (1974). Environmental Education & Environmental Attitudes. Journal of Environmental Education, 4, p. 48-51.

Radin, F. (1985). Threat, Security and Attitude Formation Among the Young. International Review of Education, 31, p. 439-456.

Regan, D. T. & Fazio, R. (1977). On the Consistency Between Attitudes and Behavior: Look to the Method of Attitude Formation. Journal of Experiential Social Psychology, 13, p. 28-45.

Rivkin, M. S. (1995). The Great Outdoors: Restoring Children's Right to Play Outside. Washington DC: National Association for the Education of Young Children.

Remmers, H. H. (1954). Introduction of Opinion and Attitude Measurement. New York, Harper & Brothers.

Shepard, C. L. & Speelman, L. R. (1985/86). Affecting Environmental Attitudes Through Outdoor Education. Journal of Environmental Education, 17, p. 33-36.

Sontag, M. S. & Bubolz, M. M. (1993). Human Ecology Theory. In P.G. Boss, W.J. Doherty, R. LaRossa, W.R. Schumm, & S.K. Steinmetz (Eds.) Sourcebook of Family Theories and Methods: A Contextual Approach. (pp. 419-448). New York: Plenum.

SPSS for Windows 6.1 (1996).

Strickland, M. P., Robertson, E. B., Jettinghoff, C. R. & Diener, C. S. (1983-84) Pretest & posttest Comparisons of Preschool Children's Knowledge about Energy. Journal of Environmental Education, 15, p. 20-23.

Szagun, G. & Mesenholl E. (1993). Environmental Ethics: An Empirical Study of West German Adolescents. Journal of Environmental Education, 25, p. 37-44.

Thomas, R. M. (1992). Comparing Theories of Child Development. Belmont, Wadsworth.

Turner, T. (1991). Sierra Club: 100 Years of Protecting Nature. New York: Harry N. Abrams, Inc.

Webster's New World Dictionary (1990). Cleveland, Webster's New World Dictionaries.