

**PLANTING A SEED: AN EXAMINATION OF NATURE PERCEPTION,
PROGRAM PROCESSES, AND OUTDOOR EXPERIENCE**

A Dissertation

by

RACHEL FAITH AARON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2009

Major Subject: Recreation, Park and Tourism Sciences

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Approved by:

Chair of Committee,	Peter A. Witt
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ABSTRACT

Planting a Seed: An Examination of Nature Perception, Program Processes,
and Outdoor Experience. (December 2009)

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Chair of Advisory Committee: Dr. Peter A. Witt

The purpose of this study was to conduct research to (a) better understand children's perceptions of nature and (b) aid in opening the "black box" related to programmatic processes and outcomes in outdoor education research. The Houston Independent School District (HISD) and their Outdoor Education Center (HISD-OEC) were utilized in a case study approach. Three separate studies were conducted. The first study used surveys, drawings and interviews to explore nature perceptions of fifth grade youth living in an urban environment. The study investigated students' definitions and perceptions of nature. Findings indicated variations in students' perceptions and suggested that direct nature experiences can play a significant role in creating a connection with nature.

The second study built upon the first. The study focused on the impact of an outdoor educational experience upon fifth grade children's' perceptions of nature. The quasi-experimental mixed-method design provided valuable insights into outcomes associated with students' participation in a four day, three night outdoor learning

experience. As result of attending the program, students increased their scores on survey measures and changes in interview responses and illustrated drawings suggested that students ascribed new meaning and increased affection for nature through participation in the HISD-OEC.

The final study provided an in-depth review of the HISD-OEC program's purpose, mission, philosophy, and program implementation practices. The findings linked student reported outcomes to program processes. The study was structured around the grounded theory approach of McKenzie which suggested six program characteristics of influence and the work of Paisley, Furman, Sibthorp, and Gookin which outlined five domains of outdoor learning. Findings extended and expanded the work of both authors in addition to providing new insights. Qualitative findings suggested that among other findings, participants valued the physical environment, activities, processing, group dynamics, instructors, changes in their own identity, unstructured time, engaging and occupying tasks, and the overall importance and desire to maintain the outdoor program.

In sum, the findings provided (a) new insight into children's nature perceptions and connections and (b) in-depth review of the HISD-OEC program offering information pertaining to program processes, characteristics, and student reported outcomes.

DEDICATION

I dedicate this dissertation to the glory of God. All of my education, talents, gifts and successes I owe to His strength and not my own. Thus, it is of first importance to acknowledge Him in all that I do as my Savior and Lord. This degree is His to be used for His glory.

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willingness to help this study come to fruition from its beginning stages within your qualitative research course. Your excitement and passion for the study were a great encouragement. I could not have asked for a better committee and I am humbled by your willingness to work with me on this project.

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CHAPTER I

INTRODUCTION

There is considerable literature suggesting that outdoor, experiential education programs offer opportunities for substantial positive developmental outcomes (Barret & Greenway, 1995; Hattie, Marsh, Neill, & Richards, 1997; Meyer & Wegner, 1998; Neill 2008; Walsh & Golins, 1976). Most notably outdoor programs have been found to be successful in promoting “life effectiveness” outcomes including self confidence, social competence, emotional control, leadership, self efficacy, and identity (Brown, 2002; Hattie et al., 1997; Neill, 2008). However, outdoor related research has long been beset by concerns about the quality and rigor of its past research endeavors (Ewert, 1989; Gass, 1993; Hattie et al., 1997). Although the field is currently embarking on creating a strong research base, too often poorly controlled, ‘one-time’ outcome studies have dominated the discipline (Bocarro & Richards, 1998; Warner, 1990). As noted by Ewert (1983): “We know something works but we don’t know why or how” (p. 27).

Understanding the “black box” that Ewert wrote about in the 1980’s is still problematic today. In general programmatic research has focused primarily on the beneficial outcomes derived from programs and virtually ignored information pertaining to how these outcomes are achieved (Mckenzie, 2000). Time and again testimonial support for programs along with anecdotal reports of positive outcomes have promoted the “good” of the sponsoring program or organization (Neill, 1997). Although these results provide

This dissertation follows the style and format of the *Journal of Leisure Research*.

information for suggested effects of the program, they provide little insight for future program implementation efforts and attempts to recreate beneficial outcomes (Moncher & Prinz, 1991).

To date, five meta-analysis reviews of outdoor related programs have been conducted (Bunting & Donley, 2002; Cason & Gills, 1994; Hans, 2000; Hattie et al., 1997; Marsh, 1999). Review of effect sizes across the five meta-analyses provide minimal support for outcomes. Outdoor programs are shown to have small-moderate impacts on participants with 65% of participants stating they were better off for having participated in outdoor programs (Hattie, et al., 1997; Neill, 2008). In spite of the many suggested benefits (e.g. self-confidence, leadership skills, and social skills) variability in outcomes across studies, programs, and individuals remain largely unexplained (Neill, 2008). In addition, studies reviewed in the meta-analyses did not include information about the processes within the program or the characteristics of the program rendering it difficult to associate program processes and outcomes (McKenzie, 2000).

Post-test questionnaires, the predominant method for measuring program outcomes, are thought to limit “conceptions of what constitutes valid/valued knowledge in outdoor education” (Brown, 2002, p. 76). Knowledge derived from outcome studies often lack relevance to practical application. Within the field of outdoor education there is a significant call (Allison & Pomeroy, 2000; Bocarro & Richards, 1998; Brookes, 2002; Kolb, 1991; Neill, 2008; Miles & Priest, 1990) to look past whether “the program works” to developing an understanding of the processes involved in why and in what way programs work. Additional research techniques and a stronger reliance upon

multiple methods of inquiry are called for within the field (e.g., ethnographic studies, case studies, longitudinal data, biographies, etc.; Bocarro & Richards, 1998; Brown, 2002). As Warner (1984) indicated,

It is paradoxical that an educational movement which places so much emphasis on learning as a process focuses its research efforts on documenting products. It is both of practical and theoretical interest to begin to explore which components of the programs produces particularly valuable learning experiences. (p. 41)

Neill and Richards (1998) add that “the increasing recognition that better outcomes will come from better processes and that therefore understanding processes is the primary route to gaining better outcomes” (p. 245).

A number of methods have been suggested throughout the field to improve research related to the effectiveness of outdoor programs and processes responsible for promoting outcomes. The current study employs three methods of research recommended within the literature. Method one concerns substantiation of grounded assumptions. As suggested by several scholars, it is critical that additional attention be given to confirming theoretical assumptions and subsequently producing a body of literature that is based upon grounded empirical research (Hattie, et al., 1997; Neill, 2008; Martin, 2004; McKenzie, 2000; Sibthorp, 2003).

Second, use of multiple methods of data collection has also been advocated to improve understanding of “what is going on” (processes) within a program (Hattie, et al., 1997). Therefore, multiple methodologies (e.g., drawings, interviews and surveys) were utilized within this to study to investigate the impact of an outdoor education program on participant’s perceptions and connections to nature. Recent literature has suggested that children’s access to nature is rapidly diminishing and that direct

experiences in nature are being replaced by secondary, vicarious encounters (Kahn & Kellert, 2002; Moore, 1997). Thus, children are not reaping the full developmental benefits of time spent in nature, leading to what has been variously cited in the literature as a de-naturing, hyper-separation, and nature deficit (Louv, 2005/2008; Hinds & Sparks, 2008; Kahn & Kellert, 2002; Moore & Wong, 1997; Plumwood, 2003; Preston, 2004). Programs that offer direct experiences within the natural environment and foster positive nature connections serve as a possible intervention strategy to ameliorate the proposed disconnects.

The third suggested method used in this study incorporates a case study approach. As noted by Neill (2008), information about a program's mission, philosophy, and purpose should be clearly communicated. In addition, features of the program should be highlighted, e.g., types of activities offered, instructional techniques, facilitation style, instructor type (e.g. level of experience and accountability), program setting, group size, sequencing of experiences, and other methods of program operation (Bocarro & Richards, 1998; Hattie, et al., 1997; McKenzie, 2000; Neill, 2008). Other issues to document include time of year the program is offered, weather, behavioral issues, and overall health of the participants. In-depth qualitative descriptions of the program, along with detailed documentation of the nature of the program, will increase the validity and reliability of study findings (McKenzie, 2000; Neill, 2008). In addition, future systematic research that provides proper documentation of program processes will aid in a better understanding of why positive outcomes occur and enable programs to

tailor curricula to increase their effectiveness in producing desired outcomes (McKenzie, 2000).

Utilizing the outlined methods, the current study examined students in the Houston Independent School District (HISD), an urban environment where nature deficits are proposed to be highest (Louv, 2005). The first article (Chapter II) was an exploratory study investigating urban students' definitions and perceptions of nature. Although the literature suggests a de-naturing (Moore & Wong, 1997), few studies have examined nature perceptions to determine if a deficit is apparent. Article one provides a foundation for the second article (Chapter III) which employed a quasi-experimental mixed methods design to assess the impact of students' participation in a four day, three night outdoor educational experience at the HISD Outdoor Education Center (OEC) on students perceptions of nature. This study utilized data from interviews, drawings, and surveys. The final article (Chapter IV) employed an in-depth case-study approach to investigate student reported outcomes related to program processes for fifth grade HISD students attending the OEC program. Overall, the three studies should provide information useful to addressing several extant issues in the outdoor education literature.

CHAPTER II

THE IMPACT OF EXPERIENCE:

URBAN STUDENTS' DEFINITIONS AND PERCEPTIONS OF NATURE

Introduction

It is at once both very familiar and extremely elusive: an idea we employ with such ease and regularity that it seems as if we ourselves are privileged with some 'natural' access to its intelligibility; but also an idea which most of us know, in some sense, to be so various and comprehensive in its use as to defy our powers of definition. On the one hand, we are perfectly at home with it, whether the reference is to the 'nature' of rocks or to rocks as a part of 'nature'; to that 'great nature that exists in the works of mighty poets' or to the humbler stuff of 'natural' fiber; to the 'nature' park or the nature encroaching on our allotment; to the rudeness of 'nature' or to a 'naturalness' of manners ...it is one thing to challenge various cultural representations of nature, quite another to represent nature as if it were a convention of culture. (Soper, 1995, p. 1)

Connections to nature once were thought to arise naturally throughout childhood.

However in the age of declining access to nature, evidence suggests that the expected affinity to nature is not so instinctive (Kahn & Kellert, 2002; Louv, 2005/2008). A growing fear is that children within the current and future generations will view nature "as if it were a convention of culture" – something to be used, owned, manipulated; not as a soulful, restorative, magical place in which fostered relationships invigorate the mind as well as the spirit (Soper, 1995). The realization of this fear was highlighted in Louv's (2005) explication of a nature deficit disorder (NDD). NDD describes the human costs of alienation from nature, among them: diminished use of the senses; attention difficulties; reduced creativity; impacts on problem solving ability and ingenuity; and increased rates of physical, mental, social and emotional problems (Louv, 2005).

Although NDD has spurred a national dialogue attracting numerous interested parties, such as: politicians, educators, health care providers, developers, practitioners, environmentalist, and parents; few studies have empirically tackled the assumption of NDD. NDD is not a scientific label; however, researchers have documented an increasing divide between children and nature (Kahn & Kellert, 2002; Moore, 1997; Pyle, 2003; Taylor & Kuo, 2006). Other terms paralleling NDD within the literature are hyper-separation, de-naturing, shifting base-line, and generational amnesia (Kahn, et al., 2008; Moore & Wong, 1997; Plumwood, 2003).

Within academia it is of both a practical and theoretical concern to produce research that substantiates or refutes grounded assumptions (i.e. NDD) (McKenzie, 2000; Neill, 2008; Pinch, 2008; Sibthorp, 2009). However, in the case of NDD, little is known about children's nature perceptions and connections, especially within urban environments. Thus, this study explored students' current nature perceptions in an effort to provide groundwork for future studies of connections or disconnections to nature. Numerous scholars advocate that advanced methodological approaches (e.g., ethnographic studies, case studies, longitudinal studies, biographies, quasi-experimental studies, etc.) employing multiple methods be used in exploratory research, subsequently generating a body of literature that is based upon grounded empirical research (Ewert & Sibthorp, 2009; Hattie, et al., 1997; Henderson, Presley, & Bialeschki, 2004; Martin, 2004; McKenzie, 2000). In light of this call, this study utilized a case-study approach, with multiple methodologies, to investigate urban students' definitions and perceptions of nature.

Nature Perspective vs. Environmental Perspective

A majority of the existing literature concerning nature is found within environmental education research. Environment and environmental attitudes underlying premise has been about nature; however, when asked about nature few are likely to give the same response as when asked a question about the environment. The environmental movement is chiefly based upon concerns about the impact post-industrial society has upon the earth. Environmental education research has largely consisted of humans' attitudes, and behaviors regarding environmental interests (i.e. recycling, political bias towards environmentalist concerns, protection of wildlands, etc).

Arguably, research questions regarding nature, nature perceptions, and human-nature connections comprise a different facet of inquiry. For example, a question from the Children's Environmental Attitude and Knowledge Scale (CHEAKS) states: "I would be willing to ride the bus to more places in order to reduce air pollution" (Leeming, O'Dwyer, & Bracken, 1995). Verses a more nature-oriented line of questioning such as; "I wish I could spend more time in nature." .Over the past several decades rapid urbanization has resulted in a population increasingly removed from nature. Thus, "nature" research in general has become an increasingly important topic from a broad range of perspectives, one of which relates to environmental issues. It is likely that children ascribe meaning to both the terms nature and the term environment; however, it is unlikely that they are the same in meaning or comprehension. An awareness of the meanings of nature and how nature is perceived, separate from an

environmental connotation, is central for further knowledge of children's nature perceptions.

Changing Demographics

Within the span of a few decades individual connections to nature and the meaning of the term nature have been transformed due to changing demographics and urban development. In other words, the ways in which children understand and experience nature has changed significantly. Studies centered on nature carried out in the 1970's often bear little relevance for understanding how young people might think about and relate to nature today. To further complicate matters, no one universal definition of nature exists and meanings associated with the term vary across different subsets of the population. Growing urbanization has resulted in an increasingly diverse population progressively more removed from nature. According to the U.S. Office of Management and Budget (2003) 83 percent of U.S. residents live within metropolitan areas. In these environments, minority populations often outnumber white, non Hispanic groups as the dominant culture (Sasidharan, 2002). By the year 2050 it is believed that nine out of every ten urban citizens will be from an ethnic or racial minority group (Stanfield, Manning, Budruk, & Floyd, 2005). The traditional under representation of these groups and the lack of context relating to culture and social class in traditional research create a pressing need for greater understanding of nature associated connections.

Therefore, this study used a case-study approach to explore meanings, definitions, and perceptions related to nature for fifth grade students attending school in a large metropolitan school district. The study examined urban-minority student's

reports of nature perceptions and understandings in an effort to investigate nature connections/deficits.

Review of Literature

The literature is presented by first reviewing perceptions of nature among children, next within urban environments, and lastly with research on minority perceptions.

Perceptions of Nature – Children

There are two spiritual dangers of not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace (Leopold, 1987/1949).

Children in today's society do not typically associate life with the land. In fact, it is frequently suggested in the literature that modern, post industrial societies are actually developing "an aversion to nature" (Preston, 2004; Russell, 1999). In addition,

A consistent concern among the researchers studying children and nature is that children's access to nature is rapidly diminishing (Kahn & Kellert, 2002; Pyle, 2002; Rivikin, 1990)...not only may there be less nature for children to access, but children's access of what remains may be increasingly sporadic (Taylor & Kuo, 2006, p. 124).

Even though contact with nature may be sporadic, research suggests that children do associate meaning and emotion with the term nature. For example, ReJeski (1982) argued that one's knowledge and understanding of nature is mediated by one's experience with nature. Rejeski suggested that accurate reasoning about nature should not be expected to occur outside of exposure to the natural world. The study involved 385 subjects from the 1st, 4th, and 8th grades. Children in the study were presented with a piece of paper with the words "Nature is" at the top and were free to give responses in

any way they chose (i.e. text, drawing). Results suggested that correct placement and understanding of nature were related to level of maturity and prior exposure to nature (ReJeski, 1982).

A study by Strommen (1995) found similar results when investigating children's conceptions of forests and forest inhabitants. Forty 1st grade children, drawn from urban areas in Nebraska and New Jersey, were asked to produce drawings of forests and were further interviewed about forests and the types of living things found in them. Results found a general lack of awareness of plant life, insects, water resources, and other forest features. Nonetheless, children's concepts of animals were quite diverse and concrete. They were able to correctly assign most forest-dwellers to the forest (e.g. deer, squirrels). However, assignments of animals were often misplaced. For example, elephants and sharks were also placed within the forest. Further analysis indicated that children who had actually visited a forest did better on all measures (i.e. could name more organisms and a wider variety of plants; and had, less misrepresentation of forest animals).

A study conducted with college-aged students gives further backing to the relationship between contact with nature and accurate perceptions (Cobern, 1993). Cobern's findings suggested that students attached meaning to nature through a number of methods (i.e. activities in nature, reflection in nature, living in nature, etc). However, one factor not associated with meaningful nature relationships was information/environmental knowledge about nature (e.g., lecture, facts). Cobern summed up the finding by advocating that science and environmental knowledge have their place "in

practice, but not in the hearts of men” (Corben, 1993, p. 948). This finding suggests that humans do not establish relationships with environmental concepts or knowledge, but rather to nature and natural places.

Perceptions of Nature – Urban

People living in rural areas, who have greater access to nature, are thought to have more affective connections for nature (Schultz, 2000), more interest in pro-nature issues, (Pooley & O’Conner, 2000), and more associations towards nature as a part of their identity (Clayton & Opatow, 2003). Researchers suggest that intimate contact with the natural world, especially at an early age, promotes positive attitudes towards nature and meaningful bonds that can last a lifetime (Chawla, 2002; Horwitz, 1996; Kellert, 2002). In a (1985) study by Bunting and Cousins findings suggest that urban children’s inclination towards nature was significantly weaker than that of rural children. In addition, they found differences in types of activities in which children engaged. Children higher in what they termed ‘pastoralism’ participated in hiking, camping, and taking care of animals. Children scoring higher on ‘urbanism’ were associated with only one activity, watching television (Bunting & Cousins, 1985). However, given changing patterns of contact with nature, current studies of nature perceptions might yield varied responses.

More recent studies point to gradual decreases in differences between a rural versus urban viewpoint (Bogner & Wiseman, 1997). Arcury and Christianson (1990) and Howell and Laska (1992) report less discrepancy in nature perspectives between rural and urban dwellers. This finding is not surprising given increasing mass communication

systems which facilitate convergence of lifestyle between rural and urban dwellers; standardized education; and increased mobility (Bogner & Wiseman, 1997). On the one hand, rural children are often choosing to play indoors with video games or computers even when the forest sits just outside the back door. As Taylor and Kuo (2006) point out children's access to nature is declining and increasingly sporadic regardless of their proximity to nature. On the other hand, urban residents who have limited accesses to nature by design are showing an increase in preference for natural scenes. A 2007 article by Berg, Hartig, and Staats suggests that adult urban residents possess a high preference for nature and perceive nature as providing restoration from stress and fatigue as well as promoting health and well-being. Other research indicates that urban occupants perceive natural environments as more beautiful, rating preference for natural scenic vistas higher than urban scenes (Purcell, Peron & Berto, 2001; Ulrich, 1993).

In addition, research also suggests that exposure to nature may provide respite from many of life's stressors linked to living in urban environments (e.g. poverty, crime, crowding). Research by Kuo and Sullivan (2001) found that the greener a building's surroundings within urban settings, the fewer crimes were reported. In another study they found that residents living in relatively barren settings reported more aggression and violence than those in greener settings as well as more mental fatigue (Kuo & Sullivan 2001). Further research by Kuo (2001) suggested that "urban housing environments could be configured to enhance residents' psychological resources for coping with poverty" (p.5). Kuo found that exposure to green environments enhanced humans effectiveness and made stressful demands more manageable. However, much of

this research has been conducted with adults and it is unclear if children would also report similar results. One particular study has been conducted with inner city children in a large public housing development in Chicago, Illinois. Taylor, Kuo, and Sullivan (2001) studied 169 inner city girls and boys randomly assigned to 12 identical high-rise buildings with varying levels of nearby nature. Findings suggested that girls self-discipline in concentration, impulse inhibition, and delay of gratification were enhanced through nearby nature. Boys indicated no relationship between self-discipline and nearby nature.

Perceptions of Nature – Minority Populations

Limited research exists regarding how members of particular minority groups define nature. In one study that does exist and explores minorities and nature, Wilhelm and Schneider (2005) used surveys, autophotographies, and interviews to explore understandings of nature among urban youth in Minneapolis -St. Paul, Minnesota. The results of the study found that the majority of youth reported reading books or magazines about nature, watching birds or animals on TV or live, and talking about nature in class. Less than half of the students had been camping, to a science museum, or had nature experiences, although some participants indicated they had taken a nature walk or hike. In addition, the authors discussed eight primary themes reported from interview data on how students defined nature: (1) *process* – growing, feeding others, eating, dying, changing throughout the day; interdependence with nature; (2) *content* – plants, animals, bugs, rocks/dirt, sky, air; (3) *locality*- descriptions of nature being outside, from the earth, and where nature is; (4) *origin*- not human made, from God or from Mother

nature; (5) *life*- a living thing, alive; (6) *beauty* – make the world look better, pretty to look at; (7) *longevity*- been here for a long time and will continue to be here; and (8) *by-products* – food, medicine, clothing, buildings, heat (Wilhelm, & Schneider, 2005).

In another study addressing minority perceptions of nature, Bixler and Carlise (1994) identified multiple fears students held when on field trips to wildlands. These fears were divided into six categories: animals, nothing, hazards, fire, plants and debris. In an earlier study Kaplan and Kaplan (1982) suggested that many of these fears come from “cognitive chaos” – students become overwhelmed by the sheer number of unrecognizable objects, smells, sounds. In addition, researchers have also noted the impact of generational fears passed down from one generation to another (Hyun, 2005). A further study by Bixler and Floyd (1997) revealed similar results; nature was identified as scary, disgusting, and uncomfortable. A wide variety of urban/rural and minority/white students reported being fearful or having negative perceptions of wildland environments. The authors provided several possible reasons for their results such as growing up inside and having a preference for the comfort of the indoors, television and movies, and traditions of ghost stories about being alone in woods (Bixler & Floyd, 1997).

Wals’s (1994) three year longitudinal qualitative research project involving both suburban and inner city communities in Detroit is one of the more comprehensive studies of perceptions of nature in minority populations due to its longitudinal design. In Wals’ overview of the three year study he provided a powerful quote from a community member:

When the journalist attended a meeting on the greening of Chicago neighborhoods, one of the organizers showed two series of slides picturing two different neighborhoods. One neighborhood consisted of poorly kept homes, yellow lawns, few trees and much litter on the streets. The other neighborhood had nice looking Victorian style homes, broad green lawns, lots of trees and clean streets. When asked what these neighborhoods had in common the audience was unable to mention anything. The organizer then replied: “Both communities are black communities. The difference is not white or black, but it’s green. (p. 44)

Wals’ reinforced this point through an analysis of his own thoughts during visits to certain sections of the Detroit and thinking “this looks like a white neighborhood” (p. 36). The difference was not one of race but one of opportunity. Wals’ found that children living in deprived/harsh conditions throughout the city developed a variety of survival and coping strategies:

...they know what to do when they hear gun shots, they are able to suppress their emotions and to ignore parts of their reality, they know how not to draw attention to themselves and know what places to avoid, they spend a lot of time indoors, mostly using outdoors to get from one place to another, and they have developed their own dreams and fantasies which provide a mental shelter. (p. 70)

Interestingly, although these children rarely spent time outside, the interviews overwhelmingly showed that somehow the students managed to build a relationship with nature. In fact, their time in nature may have been one of their coping mechanisms.

Students are able to see nature in their own neighborhood. Through the sporadic trips to a local park or to places outside of Detroit, but also as a result of sharp observations in their own neighborhood, they have developed a rather sophisticated image of nature. (p. 99)

For example, Latoyah stated, “Nature is growing, in motion, alive...

Ponds, animals running wild, cattails” and when Alicia was asked how she would

describe nature she explained “pure”, when asked how she felt in nature she explained, “clean” and when Horace was asked, would you find nature here, he stated:

There is some of it but there’s not a lot. I mean there’s like, well, it’s more like man-made nature. I think of trees planted in a yard or whatever, but real nature would be, like, the closest real nature to where I live would be the river. (p. 106)

Summary

Overall, these studies suggest that differences exist in perceptions and preferences of nature based upon multiple factors (i.e. age, residence, opportunity, etc.) (Kaplan & Talbot, 1988; Sasidharan, 2002; Talbot & Kaplan, 1993; Zhang & Gobster, 1998). . Further, literature suggests that rapid urbanization, changing demographics, and restricted accesses to natural areas has led to children’s “de-naturing” (Moore & Wong, 1997; Louv 2005). In light of abundant literature promoting positive impacts of contact and connection with nature, a suggested disconnect could have significant implications. For example, contact with nature has been found to: increase cognitive functioning, reduce stress, increase attention, provide unstructured play, increase decision making skills, increase self-awareness, decrease physical ailments, and so on (Kaplan & Kaplan, 1989; Kellert & Kahn, 2002; Lieberman, 1998; Taylor, et al., 2001; Taylor & Kuo, 2006).

In total, the literature suggests that contact with nature is a crucial factor in healthy child development. However, literature also notes a disconnect between children and nature. However, to date, few empirical studies have explored children’s nature perceptions and definitions. Thus, information about how children understand and relate

to nature, especially in urban environments is lacking. How do children in urban settings perceive nature? Do they feel disconnected from nature? This study sought to provide information to answer these questions and subsequently provide a foundation for future research on what factors influence a connection/disconnection with nature. It is important that researchers first gain insights into children's definitions and perceptions of nature as part of an overall understanding of attitudes and behaviors towards nature, and subsequently provide information about nature connections/disconnections and future strategies for re-connection.

Purpose of the Study

The current study employs a concurrent triangulation mixed-method design (Hanson, et al., 2005) to explore urban students' definitions and perceptions of nature. Both qualitative and quantitative data were collected simultaneously along with multiple methods of data collection (i.e. interviews, drawings, questionnaires). Triangulation of the results helped to insure the trustworthiness (Boyden & Ennew, 1997; Thomas & O'Kane, 1998).

Methods

Participants

The study was conducted fall 2008 with fifth grade students from the Houston Independent School District (HISD). With 202,000 students, HISD is the largest public school system in Texas and the seventh-largest in the United States. The district serves a diverse student population, which is 58 percent Hispanic, 30 percent African-American, 9 percent White, and 3 percent Asian/Pacific Islander. Approximately 78 percent of HISD's students participate in free or reduced-price meal programs. HISD also serves more than 55,000 limited-English-proficient students who, combined, speak more than 90 different native languages (www.hisd.org).

This particular study focused on 381 5th grade students from 5 different schools within the district; demographics for each school are listed in Table 2.1 on the following page. The schools were selected based upon their ultimate involvement in the HISD Outdoor Education Center (OEC) program, thus serving the needs of a larger study exploring program impacts. The schools were selected by the researcher and the OEC based on the convenience of contacts and when they were participating in the OEC program.

TABLE 2.1
Student Demographic Profile 2007-2008 Academic Year by School

	Atherton %	Brookline %	Foster %	Helms %	Oak Forest %
Gender					
Female	51	51	46	50	50
Male	49	49	54	50	50
Race/Ethnicity					
African American	81	4	90	6	13
Asian	1	<1	1	1	2
Hispanic	19	95	9	84	43
Native American	0	<1	<1	<1	<1
White	0	1	<1	9	42
Free/Reduced Lunch	97	96	98	81	40
Title I	99	100	100	100	100
Bilingual	0	67	1	40	5
ESL	5	<1	4	0	3
At-Risk	41	89	51	71	38

Of the 326 students who participated in the study 174 (53.4%) were female and 152 (46.6%) were male. Race and ethnicity demographics were congruent with overall HISD demographics with 150 (46.0%) Hispanic/Latino, 100 (30.7%) Black/African American, 42 (12.9%) White/Caucasian, 6 (1.8%) Native American, 3 (.9%) Asian, and 25 (7.7%)

A total of 381 5th grade students attended the five targeted schools, 326 (85%) completed the quantitative survey portion of the study. A randomly selected sample of 10 students (5 males, 5 females) from each of the schools (n=50) completed the qualitative portion of the study.

Constructs and Measures

Both quantitative and qualitative data were collected in order to provide different perspectives on the 5th graders' nature perspectives.

Quantitative Data. Quantitative data were collected via the Perceptions and Connections to Nature Survey (PCN; Appendix A) developed by the project researchers. The development of the PCN was influenced by the Connectedness to Nature Scale (CNS; Mayer & Fantz, 2004) and the Children's Environmental Attitude and Knowledge Scale (CHEAKS; Leeming, Dwyer, & Bracken, 1995). Questions were pooled from CNS and CHEAKS and then adapted to fit the scope of this study. In an effort to increase content validity, TAMU professors, graduate students, and twelve certified HISD 5th grade teachers proposed and reviewed survey items.

After feedback and revisions, the PCN utilized three sub-categories to assess children's nature perceptions: feelings, attitudes, and behaviors. The categories were defined as follows:

- Feelings - expressing an emotion about a topic (e.g., I wish that I could spend more time in nature).
- Attitudes - beliefs, values and dispositions leading one to act in certain ways (e.g., I believe that nature is important).
- Behaviors - the actions of people (After school I usually spend my time inside).

There were between 6 and 10 items for each construct. Davis (1989) suggested including at least six to seven items per construct for reliability. Some researchers contend that more than 10 items leads to redundancy and respondent fatigue (Bhattacharjee, 2002; Boyle, Stankov & Cattell, 1995). Both positive and negative formulations of the survey questions were included in an effort to avoid patterned responding (Kals, Schumacher, &

Montada, 1999). Items were formatted Likert –type scales (1=strongly disagree to 5=strongly agree). The survey took approximately 10 to 12 minutes for students to complete.

Qualitative – Interviews. A semi-structured interview guide (Appendix B) also was utilized to explore students’ definitions and perceptions of nature. The questions paralleled the three areas of inquiry used in PCN survey including: feelings (e.g., How do you feel when you are in nature?); attitudes (e.g., Do you think nature is important? Why?); nature related behaviors (e.g., What sorts of things do you like to do after school?) and also included participants’ knowledge of nature (e.g., What is nature to you?; What do you know about nature?). The interview guide was developed to enable differing cultural expression related to the children’s understanding of nature (Wilhelm & Schneider, 2005). In other words, when I say the word nature as a white rural female, its meaning may be very different to me than to an urban, minority student. Thus, instead of assuming that all definitions of nature are the same and asking questions as such, the first question asked of all participants is “what is nature to you?” This approach was employed because views of the world around us are not a fixed set of values or realities, and in understanding or constructing meaning, especially of a construct as complex as nature, it was necessary that it be examined in the everyday life and voice of the child from their own perspective (Patton, 1990; Marshall & Roossman, 1999; Merriam, 1998; Sale, Lohfeld, & Brazil, 2002).

Qualitative – Drawings and Descriptions. The third method of data collection employed a drawing activity (Appendix C) to provide an additional way of tapping into

childrens' understanding of nature. Participants were given a blank sheet of paper and asked to draw "nature." After completing the drawing, the student was asked to describe the drawing to the researcher. Drawing is a recognized form of communication for young children. Studies have found that drawing facilitates children's ability to talk during the interview process (Driessnack, 2005; Gross & Hayne, 1998; LaGreca, 1990; Stafstrom, Rostasy & Minster, 2002; Wesson & Salmon, 2001). In a study utilizing drawings, Theis (1996) noted that

Children often did not respond when addressed directly by an adult. Using an intermediate medium, such as pen and paper, a diagram, pictures, a ball or a toy in communicating with children immediately broke down these inhibitions. (p. 72)

Most children do not sit down like adults do to participate in a conversation; children play. Therefore, allowing children to play as they communicate helps to increase their comfort level when talking to someone new. Yuen (2004) points out that, "When involving children in qualitative research, one of the major challenges is for the adult investigator to capture the experiences and meaning from the children's perspective" (p. 1). He also suggests four contexts in which drawings can contribute to a better understanding between researcher and interviewee including: facilitating a relaxed atmosphere; gaining insight into the children's perspective; providing structure and focus to the discussion; and recognizing and reducing the potential of group think (Yuen, 2004). In addition, Fury, Carlson and Sroufe (1997) point out that for concepts such as nature, when it may be difficult to assess or express meaning, drawing can be beneficial:

Drawing is a natural mode of expression for children ages 5 to 11; long before youngsters can put their feelings and thoughts into words, they can express both

conscious and unconscious attitudes, wishes, and concerns in drawing. (Fury, Carlson & Sroufe, p.1154)

Drawing is a non-verbal language, which allows for a more precise means of communication, especially among those participants who are English language learners.

Procedures

Data were collected on the campuses of participating HISD schools; parental consent and student assent were obtained. The PCN survey was administered via a paper/pencil survey; a Spanish version was available to students if requested. The surveys were administered either in the student's classroom or in the cafeteria. The semi-structured interviews and the drawing activity took place in a classroom or office near the student's classroom following completion of the survey. Interviews lasted approximately 10 minutes per child and were voice recorded. For each selected child, the drawing activity and interview occurred during the same session. Students were given a blank piece of paper, crayons, and colored pencils and asked to "draw nature" while waiting to be interviewed. Descriptions of the drawings were done after the interview for those students who were interviewed first and before the interview for those who were interviewed last.

Results

Results are reported for each of the methods used to solicit student input.

Quantitative – Surveys

Exploratory factor analysis (principal axis, followed by Varimax rotation for factors with eigenvalues ≥ 1.0) was performed to determine the scale structure that best suited survey responses. The analysis resulted in five factors with alpha reliabilities

between .58 and .76. The factors explained 57.1 percent of the variance. The five factors were: (a) nature importance; (b) nature affinity; (c) nature disconnect; (d) environmental ethic; and (e) ownership of nature belief. Two items (19 and 21) were not included in the final factors due to the overlap of loading between several of the factors (e.g. I spend time in nature everyday; After school I usually spend my time inside). Both items had to do with actual behaviors that other factors may have had control over regardless of student's nature perceptions (e.g. taking care of younger siblings, parental rules).

Results of factor analysis are shown in Table 2.2. *Nature importance* was linked to student's belief that nature was important and should be protected. *Nature affinity* items represented students' desire to spend time in nature or feelings that they were a part of nature. *Nature disconnect* denoted students' fear, anxiety, and separation from nature. *Environmental ethic* related student's environmental behavior such as, recycling, turning off the water, etc. *Ownership of nature belief* represented students' desire to take a stand regarding their thoughts about nature. After accounting for reverse coding for some items, high scores were representative of positive nature perceptions.

TABLE 2.2
Exploratory Factor Analysis – PCN Survey

	Rotated Component Matrix					Mean	SD
	Nature Importance	Nature Affinity	Nature Disconnect	Environmental Ethic	Ownership of Nature Belief		
Attitude 28- I believe that nature is important	.811	.102	.000	.095	.075	4.43	0.89
Attitude 25-I believe that by taking care of the natural environment I can make a difference for future generations	.802	.094	-.017	-.008	.037	4.19	0.98
Feelings 16-I feel it is important to take care of nature and the natural environment	.652	.181	.035	.144	.119	4.52	0.85
Attitude 30-I believe that as I get older I will spend more time outside in nature than I do now	.575	.187	.021	-.084	.010	3.83	1.08
Feelings 14-I wish that I could spend more time in nature	.183	.787	-.011	.002	.139	3.80	1.08
Feelings 15-I feel as though I am a part of nature	.156	.787	.099	-.039	.045	3.73	1.06
Behavior 20-I try to find ways to spend time in nature	.189	.759	.071	.148	-.117	3.67	1.07
Feelings 17-I feel disconnected from nature	.046	.101	.869	-.010	.117	3.52	1.25
Feelings 13-I often feel like I am separate from nature	-0.15	.123	.778	-0.80	.1119	3.35	1.22
Feelings 18-I feel afraid or uncomfortable in nature	-.005	.008	.754	.114	.080	3.73	1.16
Behavior 24-I often leave the water running in the sink while I brush my teeth	.111	-.090	.196	.723	-.179	3.91	1.32
Behavior 23-I often leave lights on in my room when I am NOT in my room	.086	.116	.037	.696	.101	3.93	1.23
Behavior 22-My family and I usually recycle our trash	.007	.033	-.109	.675	.038	3.56	1.25
Attitude 26-I believe that spending time in nature is for people who are NOT like me	.130	-.048	.064	.012	.787	3.46	1.24
Attitude 27-In my free time I would rather play inside than outside	.050	.140	.157	-.062	.721	3.61	1.32
Attitude 29-I believe it is other people's responsibility to take care of the environment and not mine	.115	-.184	.186	.270	.594	3.90	1.26
Cronbach's Alpha	.71	.76	.76	.58	.62		

Extraction Method: Principal Component Analysis Rotation Method: Varimax with Kaiser Normalization; Eigen Value ≥ 1 ; Percentage of variance explained = 57.1.

Qualitative – Interviews

Atlas.ti.5.2 Scientific Software 2007, was utilized to organize, code, and generate themes utilizing the constant comparative method (Lincoln & Guba, 1985). Open coding was completed by the researcher and several colleagues. Emerging themes are presented paralleling the constructs within the interview guide (i.e. knowledge, feelings, attitudes, behaviors) (Refer to Table 2.3). Four themes emerged in the area of knowledge, six for feelings, four for attitudes, and five for behaviors. Under each grouping the relevant themes are listed with a short description and representative quotation.

TABLE 2.3
Qualitative Themes Associated with Interview Guide

Interview Themes	Description	Representative Quote
Definitions/ Knowledge of Nature		
Natural Elements	Students defined nature most often by mentioning natural elements such as trees, plants, animals, or flowers. In addition, nature was referred to as the wild.	When I think of nature I think it's mostly about where trees, uh, where a certain place is filled with trees and animals that could live their life free.
Outdoors/Outside	Students stated that nature is outdoors or outside. Often an activity was expressed, (e.g. camping or playing outside).	I think of the outdoors. Like what nature means...when you go outside and go camping in the backyard.
Nature is Not The City	Students reported that nature is separate from the city; a lack of civilization.	Nature is trees, wild animals, and, um, things other than the city. Um, untouched by civilization places
Unique Answer	Students described nature in a unique way; feeling full in nature, nature as part of them, a new exciting world.	Well, nature to me, it's part of my land. Or the part of the land that history means. Nature, it's out there where the lions be. It's out in the open. And lions be out there, Zebras. And all other things cuz I seen it on TV. Umm, Chanel 8. They showed nature and that's all. <i>Do you ever see nature yourself when it's not on TV?</i> Not really, Um not really.
Feelings Related to Nature		
Freedom	Students reported that they have time to play. Play is unstructured; they choose whether to be active or to rest. Expressions of freedom from stress, rules, home life, etc.	That I can have free time and I won't have to worry about sharing anything or having to play with play when I don't want to. Sometimes I play by myself, like with my imaginary friends or sometimes I'll just sit under a tree

TABLE 2.3 Continued

Interview Themes	Description	Representative Quote
Definitions/ Knowledge of Nature		
Fun	Students expressed that nature is fun or that it gives them a feeling of excitement and fun.	I don't know I can't explain the feeling. It feels good, but I can't explain it. It's like a magical moment. It's exciting cuz there's new things to experience every time you go.
Fear	Students responded that they had feelings of fear towards nature. They could possibly get lost, hurt, or attacked by animals.	It made me scared cuz it was my first, my very first time. I was nervous about, there were like things, there were big things crawling around me and I might get lost. I might not find my way back.
Tranquil, Peaceful, Time of Reflection	Students reported that nature gave them a peaceful, calm, relaxed feeling and that often they would sit and write or draw to express themselves	I don't really remember but it was a certain spot and I didn't tell anyone where I was. And that was where I just calmed myself down whenever I had a problem. My favorite things is to draw what I see and what I feel.
"That Feeling"	Students had trouble expressing how they felt about nature in words. When students responded this way it was always a good feeling.	My favorite thing about being outside is really seeing everything together. You know, like how every, how everybody's playing, like acting as one community, not just sitting around playing video games inside.
Separation from Nature	Students reported that on a daily basis they had little or no contact with nature.	I play outside by the dead end. I make the rounds. Like Biking. <i>How do you feel when you are outside around nature?</i> Um, I can barely feel it...nature.
Attitudes Related to Nature		
Makes you Healthy/Exercise	Students thought that nature provided a way to get healthier and that you got more exercise than inside	Because inside you can't get enough health. They say if you play outside more you can get healthier and healthier every day.
Need to Protect	Students expressed a desire to protect nature.	Cuz like my cousin they always tell me, like he showed me like nature and cuz, and then, like sometimes I feel bad for what they, well not bad for what they say but like what happens to nature. Cuz like we're always duping it up.
Importance	Students stated that nature was important. They had a difficult time explaining why it was important or else they gave an environmental type answer.	Because, like, nature gives us, like, well kinda a little bit. I don't really know about nature, but I've learned that it gives us...wood gives us pencils, paper, and everything. And usually like the dirt helps us, like, I don't really know.
Desire to Learn More	Students desired to learn more about nature and to develop a greater understanding of all that is around them.	I'm excited cuz like my cousin she tells me like you could learn things, about, just by looking at nature. Like, for example, like how trees grow. Or you could find out about plants. Or how the dirt gets minerals and stuff like that.
Behaviors Related to Nature/Outdoors		
Choose Outside	Students when asked about free-time after school overwhelmingly chose to be outside. Freedom, adventure, and more to do where some of the reasons expressed.	Outside...my favorite thing about nature is that it's sometimes its peace and quiet, but sometimes it's exciting and full of life.
Choose Inside	Some students chose to be inside when given an option of free-time. Reasons expressed where fear of outdoors, desire to play video games and watch TV, and the heat of the outdoors.	Inside...because you don't know what's out there? Like animals that that's not that good that destroy people or people, like, when they hurt people.

TABLE 2.3 Continued

Interview Themes	Description	Representative Quote
Definitions/ Knowledge of Nature		
Active Outside	Students across the board reported being active outside. At times they may sit under a tree or stare at the stars but part of what they expressed enjoyment about being outdoors was that they got to run and be active.	I feel very active and I feel, um, I feel like it's, you know, you just, it's a carefree world. You just go out and play
Inactive Inside	Students reported inactivity when indoors. They reported sitting and watching TV or playing video games.	I stop by the store and get me some junk food and then I go home. And I just sit down, do my homework, and then I get on the computer or sit down and watch House of Pain.
No Choice	Students described that they although they might choose to go outside, they often don't get to choose.	I just go home and have to stay inside; I don't really go outside that much. Sometimes on the weekends, yeah, sometimes.

Knowledge. Not surprisingly, for urban minority students nature understandings consist of natural elements (e.g., trees, plants, animals, the wild) and also “not the city” (e.g., not man-made, lack of civilization). What is interesting in the current study was that students’ definition often included the concept of nature being outdoors or outside. Superficially, that statement makes sense... “nature *is* outside.” However, outside was used interchangeably by the students with the word nature. Much of the outdoors that students come in contact does not consist of natural settings; yet, it was outside (versus inside) so therefore it was listed as so. For example, sidewalks and dead-end streets were said to be nature. Some students gave unique responses to the nature questions. For example, when asked to define nature one student stated, “I feel full in nature” and another that “nature is life.”

Feelings. The second category reported students' feelings about nature. Students felt freedom, with freedom having several different connotations. Students reported that nature was freeing and that animals could roam freely. Freedom to play was often listed as well as freedom from rules, worries, and structured activities. In addition, children reported that they felt excited in nature and that it was fun. The students did not give much elaboration, and when the researcher asked why they felt excited in nature, the most typical response was "because it is just fun."

Fear was also a recognized feeling among children when asked about nature. Usually it was fear of the unknown or fear of being without modern conveniences, for example: "I'm not sure what is out there;" "I could get lost or hurt;" "animals could kill me;" "My phone won't work, I wouldn't have cell service." On the other hand, some students reported feelings of tranquility, peace, and reflection.

Nature also provided a time of renewal where students reported sitting alone to write or draw what they felt inside. Interestingly, students reported experiencing, "that feeling" when discussing nature. This expression usually referred to a positive feeling that students had trouble communicating. For instance,

I think it is very tranquil, very peaceful. Uh, I don't know how to put it in words. I think they should go there. It's uh, you could play, it has a lot. I've been outside and I've just stared at all the trees and you...I have that feeling. It feels...it's a good feeling, I feel really happy.

Lastly, students described feeling separate from nature with statements such as "I barely can feel it;" "I don't have no feeling about it cause I'm not around it;" "I can't even see it so I don't know."

Attitudes. When discussing attitudes, students expressed more mature ideas about nature. The attitude that nature “makes” you healthy and that you “actually get exercise” was communicated; one student even expressed that they liked nature because “I burn more calories.” An environmental ethic to protect nature was articulated as well, students reported that they “gotta help keep nature clean” and “keep people from messing the trees down and breaking them.” Closely related to the desire to protect nature was the attitude that nature is important. Students often were not really sure why nature was important, they just knew that “it is important ‘cause we need it.” A universal attitude students conveyed was the desire to learn more about nature. Even when they had not been exposed much to nature, students expressed fascination with nature. For example, “Well, nature like it’s not that special to me but I want to learn how to appreciate it.”

Behaviors. Behaviors related to nature revealed that when asked about free time, overwhelmingly students choose to be outside. Reasons given for preferring to be outside included adventure, lack of limitations, and freedom. Other responses were “So I can feel the air. I like it because I can feel it on my face” and “there’s a lot of stuff outside than there are inside because a lot more stuff happens outside than inside.” Some students did report that they would choose to be inside in their free time because of fear of people or animals, or because they wanted to watch TV or play video games.

Students described being active outside; “I can actually just run and play.” Conversely, students reported being inactive inside with watching TV, playing video games, or playing on the computer as the primary activities expressed. The final

represented idea related to behavior was that of having “no choice.” Regardless of their feelings or attitudes about nature, often children reported they did not have a choice in their behavior. Parents usually decided if children were allowed to be outside in nature after school. Parents attitudes may be shaped by several different constraints related to being in an urban environment (e.g., safety, transportation, lack of supervision, etc).

Four themes emerged outside the context of the interview guide categories. Since these themes became apparent through the students’ drawings and descriptions, they are discussed as a part of the drawing results.

Qualitative – Drawings

Drawings (n=50) were analyzed by a panel of professionals at the 2009 Texas Experiential Ropes Association (TERA) conference and also by students in one of the Spring 2009 outdoor-related courses at Texas A&M University. Ratings included determining the number of natural items (anything not man-made such as trees, grass, birds, etc.; $M=15.9$, $SD=11$); and manmade items (item made by humans such as sidewalks, houses, cars, tents, etc.; $M=.74$, $SD=1.5$). There were from 2-45 natural items and 0-7 man-made items for any one drawing. Additionally, analyses were conducted to determine whether drawings were depicted as a real (N=9, 18%) or imaginary (N=40, 80%) or place unknown (N=1, 2%). Results are reported in Table 2.4.

TABLE 2.4
Drawing Descriptive (n=50)

Drawings	N	%
Imaginary	40	80
Real	9	18
Unknown	1	2

	Mean	SD
Number of natural elements	15.9	11
Number of manmade elements	0.7	1.5

Frequency	Lowest	Highest
Number of natural elements	2	45
Number of manmade elements	0	7

In addition to rating the drawings, student descriptions of their drawings were analyzed. Four themes emerged related to past experiences in natural settings and real or imagined nature. The four themes are listed in Table 2.5 and discussed next.

TABLE 2.5
Emerging Themes Developed from Interview Drawings and Descriptions

Theme	Description	Representative Quote
Experience with Nature		
Direct Experience	Students talked about an experience with nature. Many happened years prior or were sporadic exposures. Often a family member, teacher, or friend took them into nature.	I've gone camping 3 times with the girl scouts before. I went to somebody's, some of the girl scout camps. It was, we had cabins and, um. We had like we didn't have lights in the cabins and stuff. And there's some places where you can just go in the wilderness and you find little sitting places. And it's pretty cool. It's so quiet and so peaceful and you just think, it's you; just thinking about the city and how it's so loud and then...you just have peace and quiet.
No Experience	When asked about a nature experience students commented that they were not around nature or that they had no nature experiences.	<i>Can you tell me about a nature experience or about a time that you were in nature?</i> No, I don't really think so. <i>Ok, Do you go outside at all?</i> Not that much.
Drawings		
Real place and/or experience	Students drew nature as a real place where they had experienced direct contact with nature. Often, it was a small amount of exposure that had a lasting impact.	These are mooses, and a cabin, and trees, grass, birds, and clouds, and the sun. It is in Jasper where my mom's dad live. I like the pond and the beds in the cabin. I went in 2004 and we played and had fun.
Imaginary place and/or experience	Students drew nature how they imagined nature to be. Students pulled from what they had heard/seen about nature from TV, computer, friends, and family. Almost all students wanted to go to this imagined place.	Me and my mom and my step dad are camping. No, I have never been. Well, we were gonna go but my ex, my dad, um, my step dad had to go cuz they called him at work. Like whenever people tell me something I imagine it.

When asked to tell the researcher about a nature experience, students often referred to what they had drawn as a real experience or did not refer to their drawing of nature and expressed no past experience with nature. Results suggest that most students who drew a real place or experience described direct exposure to nature, while students who drew imagined nature had little or no exposure to nature that they could recall. To explain further, representative drawings are presented for each of the types of drawings observed (Figures 2.1, 2.2, and 2.3).

Category 1: “Generic” Imagined Drawing of Nature, No Experience. These drawings often included basic natural elements and students explained that this is what they had heard about nature or thought nature to be.

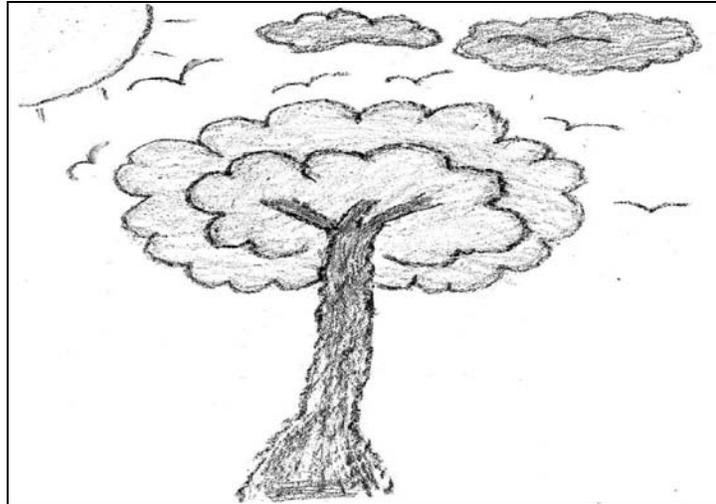


Figure 2.1. Generic imagined drawing.

This picture was explained by the respondent as follows:

Respondent (R): My drawing is like a tree with birds and stuff. Some clouds and the sun.

Interviewer (I): Is this a place you have been to?

R: No, this is what, um what I imagined nature is.

I: Do you think this place exists in the world?

R: Yeah, um pretty far from here?

I: Would you like to go to this place or not really?

R: I think I would like to.

I: What would you do there?

R: Um, I would just lay down and stare at the sky.

I: Anything else you want to tell me about your drawing?

R: Um, the birds is pigeons.

Category 2: Imagined Drawing of Nature, Little or No Experience. Drawings in this category were detailed and had lots of animals, people, or objects. Most often items were out of place and or context. For example, sharks, dinosaurs, gorillas, etc were placed in the forest along with squirrels. In addition, a sidewalk or skyscraper would be included in the drawing of nature.

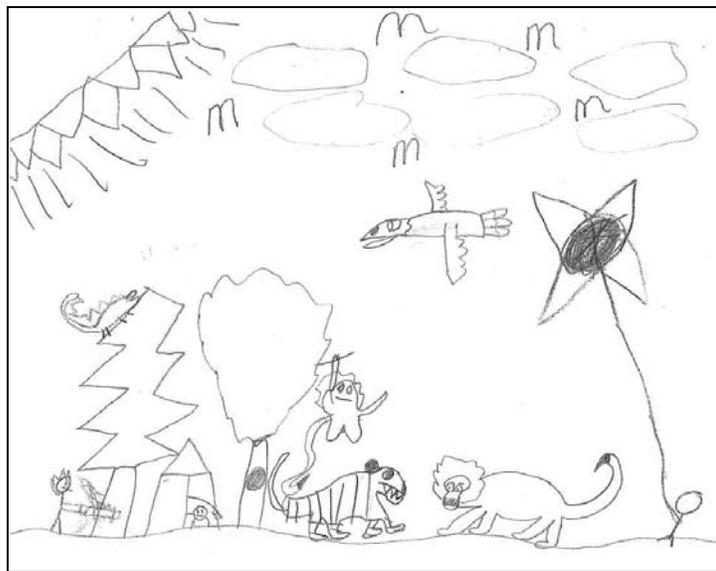


Figure 2.2. Imagined drawing.

The child explained the drawing as follows:

R: I gots animals, trees, the sky, bird and habitats.

I: Anything else?

R: A kite flyer and eagle. Lion and a Tiger and a monkey on a tree branch.

I: Okay, what else?

R: A hole in the tree for a bird to live in and a man cutting another tree down with a lizard on top.

I: Why is the man cutting it down?

R: Because they need more space.

I: Is this a place that you have been to?

R: No, I never been. I imagined.

I: Do you think this place exists in the world?

R: Yeah, far away.

I: What would you do if you were here?

R: Snap pictures, go camping cuz I never did.

Category 3: A Real Place in Nature or Real Experience. These students' drawings were specific, detailed, and particular in natural content. Descriptions were often lengthy and the memory of the experience was recounted in detail.

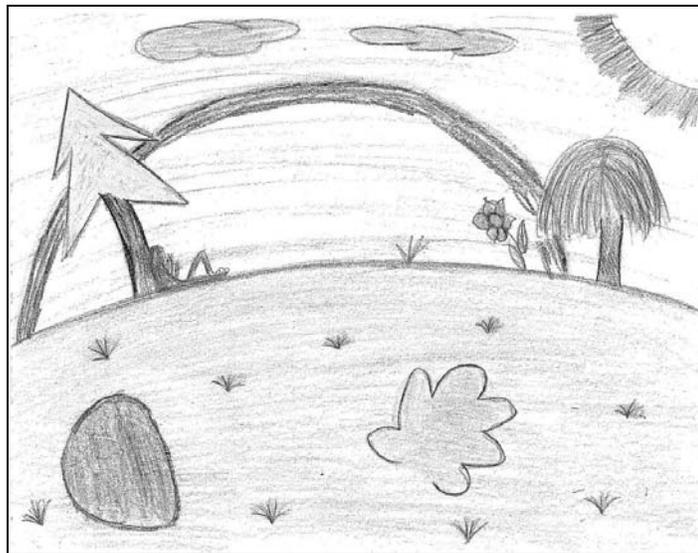


Figure 2.3. Real place in nature.

The child explained the drawing as follows:

R: It has different kinds of trees and it's a hill behind uncle's ranch. The grass is really soft to sit and stuff.

I: What else?

R: It gets hot outside cause of the sun and um, you can just sit under the tree and see lots. Like um, this one time, um we saw a rainbow! Like a real one!

I: Wow that is cool! What else?

R: My brothers and me, um, we sometimes roll down the hill and um, run back to the top. We racin' my cousins.

I: How often do you get to go to your uncle's ranch?

R: Um, not that much, like once or twice.

I: What is your favorite thing to do when you are there?

R: Well we get to play and run and you get to look at lots of things, um, animals and stuff.

Discussion

The purpose of this study was to explore urban minority students' definitions and perceptions of nature. The results of this exploratory study suggest two differing responses by students when asked about nature. One group of participant's responses reflect a nature deficit, while for another, no deficit is noted and in fact, a strong connection with nature appears to exist. These conflicting ideas were apparent as the data was analyzed across methods (i.e. surveys, interviews, drawings).

Students Identified with a Nature Deficit

Students who demonstrated a NDD presented imaginary "generic" ideas of nature through drawing and descriptions. They reported little or no experience with nature. In addition, interview responses regarding behaviors suggested that, although they might choose the outdoors in free time, little time was spent outdoors. Attitudes related to nature appeared out of context and seemed to express what they had been taught was the "right thing" to say. For example, "nature makes you healthy" or it is "important to protect nature." When students were questioned further as to why it is important to protect nature, they were often unsure of how these statements connected to nature. Feelings reported towards nature expressed fear of the unknown and anxiety over a lack of comfort and convenience. Knowledge of nature was high, though regularly misguided in placement of animals (e.g. shark in the forest), objects (swimming pool in

forest), or associations related to nature (i.e. nature is outside- anything outside, nature is not inside).

Current literature suggests that a de-naturing is taking place among urban inner city kids, thus the results suggesting nature deficit are not surprising. Results parallel those of other studies where students misplaced natural elements and animals and often drew or explained nature out of context (ReJeski, 1982; Strommen, 1995). Additionally, findings give credence to Cobern's (1993) work in which scientific knowledge alone held no bearing with nature affinity. In fact, findings from this study found that students could articulate detailed nature definitions, communicate benefits of nature and display pro-environmental attitudes. However, when asked about feelings related to nature a void was often expressed by students shrugging shoulders or commenting that they had never "known nature." In response to further questions, students often reported minimal nature experiences. This finding may suggest that students are being socialized to respond to questions about nature with "pro-nature", "save the earth" retorts as suggested in the literature (Bogner & Wiseman, 1997). Nonetheless, Turner and colleagues (2004) suggested that people in urban areas live with impoverished biodiversity and lack of access to areas of green space; thus, they are likely to experience disconnect. In addition, young children in urban environments face further constraints in gaining access to nature due to poverty, crime, lack of supervision, and issues of transportation (Turner, et al., 2004). Lastly, students also reported feelings of fear and anxiety concerning nature as supported by Bixler and Floyd (1997). Together, these

elements would suggest the possibility of a nature deficit and future research is needed to explore the characteristics associated with the term nature deficit disorder.

Students Identified with a Strong Connection to Nature

Conversely, students with a strong connection to nature drew a real nature place and described an actual direct nature experience. Often descriptions were detailed memories recounting family and friend involvement along with events occurring throughout the encounter. Interview responses about behaviors showed a high preference for the out-of-doors and described activities participated outdoors after school. Attitudes included an excitement to learn more and a fascination with nature along with references to the importance and need to protect nature. Feelings related to nature were meaningful and nature was described as restorative, freeing, and provided “that feeling” which was difficult to put into words... “a magical moment.” Definitions and knowledge of nature were diverse with numerous natural elements reported. Unique definitions were insightful and associated with a high affinity for nature.

The finding that urban metropolitan minority students possess a strong connection to nature is contradictory to the literature. Studies that portray similar findings exist within environmental research but only take into account an environmental perspective. For example, the *Environmental Degradation Theory* proposes that exposure to ongoing environmental degradation may increase urban residents’ awareness and desire toward pro-environmentalist actions (Van Liere & Noe, 1981). Bogner and Wiseman (1997) note that:

Urban residents are generally exposed to higher levels of environmental and ecological deterioration and hence are more likely to experience environmental

problems at first hand; such issues, therefore, become more salient to them and this in turn leads to greater environmental concern. (p. 112)

However, socialization is also a possible factor as was discussed above. Even so, the current study suggests that students portrayed an affinity to nature outside of any environmental concern. They expressed positive emotions towards nature and a desire to spend more time in the natural world. Given that the current results appear to run counter to studies of urban dwellers, the question becomes, how are these bonds formulated?

Interpretations

Interestingly minority students' definitions and perceptions of nature were classified into opposing responses: nature deficit and nature connection. What is intriguing is that study findings expose the potential root of divergent response. As previous studies suggest, experience with nature is correlate supporter of nature affinity. Findings from this study suggest the common thread linking students to nature deficit or nature connection are related to student's previous direct experiences, or lack thereof, in nature. In the book *Children and Nature*, Kellert (2002) proposes a framework linking direct, indirect, and vicarious nature experiences to cognitive, affective and evaluative modes of learning. These three kinds of experiences in nature are distinguished by their developmental impacts upon children. Direct experiences are considered to involve contact with natural settings outside and independent of the human built environment. In other words, a direct experience would involve unobstructed access to play within the natural world. The findings of this study suggest that children who possess a strong connection to nature are those who have past exposure to direct nature experiences. Noted through their drawings, interviews, and survey responses, these students described

a fascination with and excitement about nature along with meaningful connections to natural places. According to research by Sebba (1991), affinity for nature developed through direct experience has a lasting effect. For example, when asked to name the most significant place from childhood, adults consistently named a special outdoor place. Sebba suggests that preference for nature seems to be influenced by the availability of natural areas throughout childhood, rather direct access.

Conversely, findings suggesting that students suffer from a nature deficit express little or no direct experience with nature and often mention “imagined” nature through vicarious exposure. Vicarious, or what Kellert (2002) also calls symbolic experience, occurs in the absence of actual physical contact with nature. Instead, what the child encounters are representations of nature that can be realistic, metaphorical, symbolic or stylized characterizations viewed from TV, movies, computers, magazines, or books (Kahn & Kellert, 2002). The disconnect of vicarious nature exposures concerns many who are exploring nature experiences (Kahn & Kellert, 2002; Nabhan & Trimble, 1994; Pyle, 2003). Kellert (2002) terms the disconnect as the erosion of the experience: “...erosion of direct and spontaneous contact with relatively undisturbed nature, especially among urban and suburban children, for the corresponding substitution of more artificial and symbolic encounters” (p. 120). Findings from this study suggest a gap between what urban students learn and see vicariously and what they feel and appreciate directly. Students expressing a deficit possessed cognitive knowledge about nature but no frame of reference with which to connect that knowledge to actual behavior. This conclusion is consistent with other study findings suggesting that direct experiences

produce affective based attitudes that impact behavior and identity, rather than cognitive based attitudes only, which are developed primarily through indirect and vicarious experience (Fazio & Zanna, 1981; Millar & Millar, 1996). Thus, findings from this study suggest that NDD is likely to be found both in urban and rural environments, just as nature connection was found to be in an urban setting with minimal surrounding nature. The impacting factor was less about residential location and more about exposure and experience.

Future Research

Future research might employ Kellert's framework for direct, indirect and vicarious experiences into the methodological procedures of the study. Asking questions about student exposure to nature within the context of each construct would place further credence in the findings of this study. Indirect experience in this particular study was not recorded. Indirect experiences involve physical contact with nature in managed, contrived or restricted context such as a zoo, aquarium, or museum. It would be of interest to observe how students with predominantly indirect exposure to nature would fall along the deficit-connection continuum. Would a combination of indirect and vicarious experiences decrease nature deficit? Is one direct experience lasting in effect or are multiple direct experiences needed? In an urban environment what would constitute a direct experience for a child?

In addition, efforts might incorporate the theory of planned behavior (TPB; Ajzen, 1985, 1991) to clarify the processes linking knowledge, attitudes and behaviors. The relationship and connection students created while in direct contact with nature

seemingly left a lasting effect and could be explored further. As noted by Wells (2000) “Nature, with its inexhaustible opportunities for engagement and exploration, provides an endless space for children’s play and reflection...nature is unlikely to grow tiresome” (p. 791). Longitudinal studies examining students’ nature perceptions throughout childhood, teen years, and adult life would provide invaluable insight.

Another area of exploration would involve the differences in imagined versus real settings evidenced within the students’ drawings. Could imagined nature have similar benefits to that of vicarious or indirect nature? Does imagined nature buffer any of the by-products of nature disconnect? Follow-up studies with students expressing imagined natural places and those with real nature experiences would be of interest.

The generalizability of the study findings is unclear. The population of interest in this study was urban minority 5th grade students from HISD. Would these findings generalize to younger and older children? Would there be differences if data for Hispanic students were compared to those of African American students? How would outcomes differ if students from urban and rural environments were compared?

Lastly, it would also be valuable to continue to tease apart the literature base to better distinguish between a nature and environmental perspective. Although this study did not explore environmental definitions and perceptions, judging from information on previous students emotional, intellectual, and socialized responses to nature appear to differ. The distinction between these two perspectives may not need to be journal divided but simply determined within the scope of the research, especially when

investigating how children define and place meaning to the natural world around them. At the very least, a distinction in text would be worthy of exploration.

Conclusions

This study had several strengths. For example, the study included a large, diverse sample. A second strength was the distinct focus upon nature perceptions outside of an environmental context. Finally, multiple methods were employed including drawings, descriptions, interviews, and surveys. This approach enabled triangulation of results.

The literature suggests that children, especially children in urban settings, are experiencing a disconnect from nature. However, few empirical studies have examined urban childrens' definitions and perceptions of nature. This study begins to fill that gap by studying how urban students perceive nature. With the vast benefits associated with contact with nature, future studies of nature connection or re-connection are necessary. For example, as indicated by this study, the urban environment may be less of a factor of influence than direct exposure.

Limitations

Study limitations included response bias in self-reports; potential for group-think on drawings and surveys; and variability among schools and their students' pre-existing knowledge. To address the above concerns, efforts were made by researchers to ensure students that no grades would be applied to responses and that truthful answers were desired and would be considered confidential. Other limitations included the use of an exploratory survey as well as language barriers between the individuals collecting the

data and the participants. In an effort to overcome these limitations multiple forms of data were collected and Spanish surveys and interpreters were available to the students.

Implications

The results of this study suggest that nature definitions and perceptions are an important area of study to further understand whether the current the generation of urban children have a nature deficit. What is apparent is that students will provide meaning to the term nature regardless of exposure. Nature definitions followed two lines of response, an affective meaningful response suggesting connection and one that was more generic and nonspecific suggesting deficit. Although a lack of direct experience was linked to nature disconnect more so than the urban environment, for the population of interest, direct access to nature was often limited. Therefore, students are at high-risk due to a lack of access to direct experience. A promising finding for outdoor practitioners is the deduction that direct exposure to nature, even when sporadic, was found to overcome the built urban environment as a method of re-connection/connection.

Remarkably, many urban minority students projected a strong connection to nature in spite of environmental constraints. This finding is optimistic and should encourage future study of direct contact with nature as a re-connection strategy for students expressing side-effects of NDD. Further, in future studies, residence and ethnicity may become increasingly unimportant predictors of nature affinity. With the changing demographics and suburban and urban differences diminishing, direct contact with nature may become a more relevant factor to investigate. Historically, the

population of interest has been under represented; the results presented bring about some new insights. In addition, nature study, from a deficit perspective, is a relatively new area of research in response to the rapid urbanization and technological advances within the past 20 years. The current study is exploratory and offers a foundation for future research. Even so, what does seem to be evident is the idea that experiential learning through direct contact is not only beneficial but necessary for connection.

CHAPTER III
THE IMPACT OF AN OUTDOOR EDUCATION PROGRAM ON CHILDRENS’
PERCEPTIONS AND CONNECTIONS TO NATURE

Introduction

The natural environment has long attracted children in search of exploration, adventure, and solitude. Today, however, children are spending fewer hours outside, thus missing the experience of the natural world and all it has to offer. A 2005 book by Richard Louv, *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder* brought this void to the forefront. Nature deficit disorder (NDD) describes the human costs of alienation from nature, among them a diminished use of one’s senses; attention difficulties; reduced creativity, problem solving and ingenuity; and increased rates of physical, mental, social and emotional problems (Louv, 2005). Though NDD is not a scientific label, Louv uses the term to publicize the need for a better understanding of the disconnect between children and nature and the problem that disconnect represents to society. Many researchers agree that the disconnect between children and nature is an urgent issue due to diminishing green space. Taylor and Kuo (2006) reported:

A consistent concern among the researchers studying children and nature is that young people’s access to nature is rapidly diminishing...not only may there be less nature for children to access, but children’s access of what remains may be increasingly sporadic. (p. 124)

Since Louv’s suggested NDD, parents, practitioners, and scholars have reviewed available literature for information related to reconnecting children with the natural

environment. Unfortunately, since this is a relatively recent concern (within the last 2-3 decades), sufficient literature is lacking that suggests how to foster nature connections. Thus, existing programs that are nature focused are now receiving increased attention. For instance, multiple studies point to a relationship between outdoor/nature-based experiences and environmental attitudes (Brookes, 2002; Gruenewald, 2004; Hattie, Marsh, Neill, & Richards, 1997; Loeffler, 2004; Martin, 2004; Neill, 1997; Preston, 2004; Walsh-Daneshmandi & MacLachlan, 2006). Yet, few studies have examined specifically if these types of programs impact nature perceptions or even more importantly; if they foster a nature connection.

Drawing on the need for strategies to reconnect children to nature, this study investigates outdoor education programs as a possible means for achieving the goal of re-connection. The term outdoor education is often used interchangeably with environmental education, adventure education, nature-based education, experiential education and place-based education. Although, each individual term has its own specific clarifying criteria; all are mutually supportive of the other. Outdoor Education is the umbrella phrase that encompasses aspects of all the other terms listed.

Although no universal definition of outdoor education exists, in Hammerman and Hammerman's (1968) seminal book, *Outdoor Education: A Book of Readings*, Sharp offered the following description:

Educators have learned more and more through the years the importance of teaching from natural situations. Most of the things children learn about are brought to school, to be touched and handled and studied. The school, of course, keeps getting bigger, in order to house the collections from which the children study. We know we are on the right track, for we know the best way to learn is to come in contact with the things we seek

to know. Outdoor education, in its simplest aspect, merely says: Don't try to bring the whole world into the school. Rather, take the children out to where the world is. (pp. 1-2)

In addition Priest (1986) offered another commonly cited definition:

Outdoor education is an experiential process of learning by doing, which takes place primarily through exposure to the out-of doors. In outdoor education the emphasis for the subject of learning is placed on relationships; relationships concerning people and natural resources. (p.13)

Priest based his definition on six elements, noting that outdoor education is: (a) a method for learning; (b) experiential; (c) primarily taught outdoors; (d) requiring the use of all senses and domains; (e) based upon interdisciplinary curriculum; and (f) a matter of relationships involving people and natural resources. In the current study, outdoor education will refer to a 4 day, 3 night hands-on, experience-based learning outdoor program provided by the Houston Independent School District's Outdoor Education Center (HISD-OEC). The purpose of this quasi-experimental study was to investigate the impact of the HISD-OEC program on students' definitions and perceptions of nature. Multiple methods of data collection were utilized and further insight into students' nature perceptions was gained.

Review of Literature

There are two spiritual dangers of not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace. (Leopold, 1987/1949)

Nature Deficit

Today, perhaps more than ever, Aldo Leopold's words are echoed in ecological research. Warnings about the separation of humans from the natural world in the 1940's

seem apparent in the current generation (Preston, 2004). Children in today's society do not associate life with the land. In fact, suggestions that modern, post industrial societies are actually developing "an aversion to nature" are proposed in the literature (Russell, 1999; Preston, 2004). Pyle (1978) labeled the reduction of children's direct contact with nature the 'extinction of experience.' He claims that this leads to a cycle of apathy and lack of concern for the natural environment and all that co-exist within it including our fellow humans (Pyle, 1978).

Connections to nature once were thought to arise naturally throughout childhood. However, in the age of declining access to nature, evidence suggests that expected affinity to nature is not so instinctive and that relationships to nature must be fostered (Kahn & Kellert, 2002). A growing fear is that children within current and future generations will view nature "as if it were a convention of culture" – something to be used, owned, manipulated; not as a soulful, restorative, magical place in which fostered relationships invigorate the mind as well as the spirit (Soper, 1995, p. 1). The realization of this fear has been highly publicized in Louv's (2005) book although, his research was not the first to suggest a disconnect. For example, Moore suggested that a de-naturing of our children is in progress and expressed a similar idea to what has been labeled NDD (Moore & Wong, 1997). Plumwood (2003) also supports the concept of "denaturing," but used the term "hyper-separation" to indicate how culture treats nature as "other." Hyper-separation encompasses feelings that humans are separate from nature as well as perceptions of nature as inferior and "lacking real continuity with the human" (Plumwood, 2003, p. 54). In addition, Pergrams and Zaradic (2006) coined the term

vidophilia - the new human tendency to focus on sedentary activities involving electronic media; as quickly overcoming the long held hypothesis of biophilia - the innate human tendency to affiliate with the natural world and other living organisms.

Further research by Kahn (2008) introduced the idea of generational amnesia or the shifting baseline theory to explain the current divide between children and the natural world. Kahn asks the question, if contact with nature is so good for humans why are we destroying it? Kahn offers one possible answer: the baseline for comparing what is normal continues to shift downward as environmental conditions degrade, i.e., generational amnesia (Kahn et al., 2008).

In an earlier study, Kahn and Friedman (1995) illustrated this idea by asking inner-city children in Houston to describe pollution. Results showed that a significant number of the young children interviewed understood the concept of air pollution, but they did not believe that Houston had a problem with pollution. (Note: Houston is one of the most polluted cities in the United States [American Lung Association, 2008]). In interpreting the results, Kahn and Friedman (1995) suggested that children lacked a comparative baseline. In other words, these children were born into pollution, so to them Houston is not polluted. The authors also noted that humans construct a conception of what is environmentally normal based on the natural world they encountered in childhood. Kahn and Friedman argued, "The crux is that with each ensuing generation, the amount of environmental degradation can increase, but each generation tends to take that degraded condition as the non-degraded condition, the normal experience with nature" (p. 1414).

It is not surprising that concepts of nature deficit, hyper-separation and generational amnesia coincide with the identified trend that humans are spending more time indoors than ever before (Blair, Stewart-Brown, Waterson & Crowther, 2003). Humans are living increasingly in urban environments. According to the United Nations Population Division, almost 50% of all people in the world live in urban areas and this is projected to increase to > 65% by 2030 (Turner, Nakamura, & Dinetti, 2004). Parents, and thus their children, are living in built environments in which they are surrounded by human-made structures. Blair noted that the average child in the United States spends 5 hours a day in sedentary activities like watching TV, using computers, playing video games, talking on the phone, or listening to music. Bike riding is down 31% since 1995, only 6% of children aged 9 to 13 weekly play outside on their own, 80% of children under age 2 have no daily access to the outdoors and 60% of those ages 2-5 have no access to daily outdoor play (Children & Nature Network, 2008).

Research also shows that childrens' lives are increasingly programmed with structured activity (Davis, 1999; Ginsburg, et. al., 2007; Spencer & Blades, 2006) leaving little room for much needed exploration and unstructured free play (Dillon, et al., 2003; Kahn & Kellert, 2002) Parents are limiting children's freedom to roam more than in previous generations (Gaster, 1991; Hillman, Adams, & Whitelegg, 1990) and ensuing pressures upon schools to prepare for standardized testing has also attributed to the decline of outdoor experiences. The International Play Association reported that 40 percent of schools have eliminated recess or have greatly reduced recess time for indoor test preparation (Clements, 2005). In addition, after school outdoor play has been

replaced with organized sports. Marano (2004) suggests that, although beneficial, organized sports are organized by adults and adults generally do not “play.” A report by Maller, et al. (2006) concluded, “Whilst modern ‘westernization’ has doubled our life expectancy, it has also created disparities between ancient and present ways of living that may have paved the way for the emergence of new serious diseases” (p. 45).

Haginoya (1996) suggests that the saddest consequential disease for children would be mourning the death of childhood play – no more play in bushes, puddles, and hidden places: “The mere thought of growing into a social person without the experience of outdoor play makes me shudder” (p. 4).

All of the above information suggests an increasing divide between children and the natural environment. Urban children, notably, are at greater risk of experiencing symptoms of a nature deficit than those residing in more rural areas. In a study comparing biological diversity of urban neighborhoods, Turner and colleagues (2004) found that the majority of people in urban areas live with impoverished biodiversity and lack access to areas of green space. In addition, many young children in urban environments will face further constraints in gaining access to limited green spaces due to poverty, crime, lack of supervision, and issues of transportation. Gill (2005) concluded “Children are disappearing from the outdoors at a rate that would make the top of any conservationist’s list of endangered species if they were any other member of the animal kingdom” (p. 68). Researchers are unaware of the looming effects of generational separation from the natural world; however, if the suggested indicators of

nature deficit disorder are any indication, it may be the greatest concern facing the planet at the turn of the century (Hart, 1997).

Importance of Nature Connections

Taylor and Kuo (2006) note, “We know that children need nature...or do we?” (p. 124). Current and existing research would suggest “yes.” In fact, researchers argue that this question has redundantly been answered in the affirmative throughout the empirical, theoretical, and anecdotal evidence drawn from the literature (Maller, et al., 2006). What we do not know is the amount of nature contact needed, what type of contact, and so on. The literature overwhelmingly supports that contact with nature promotes healthy child development through increased interpersonal skills, improved self-concept, sense of personal autonomy, greater capacity for decision making, increased self-awareness, increased ability to focus, less depression, fewer physical ailments, decreased stress, and so on (Kaplan & Kaplan, 1989; Kellert & Kahn, 2002; Lieberman, 1998; Taylor, et al., 2001; Taylor & Kuo, 2006; Ulrich, 1984).

Throughout history unstructured outdoor play has been the primary vehicle for learning and development among children (Dewey, 1930; Frost, 2006). Outdoor free play is immeasurably valuable; it is a time when children are immersed in the activity of their surroundings and allowed to discover and explore nearby life (Frost, 2006). Nash (1997) concludes that “children who don’t play much or are rarely touched develop brains 20 percent to 30 percent smaller than normal for their age (p. 51).

Play in wild places, gardens, and other natural outdoor areas is full of stimulation from the world at hand and often from social gatherings that occur outside the home;

such as neighboring children at play (Nash, 1997). Frost (2006) noted that if we continue to shelter our children from risk of injury by not letting them play outside this alone may prove to be one of the most misguided parental impressions of our day: “In the real world, life is filled with risks – financial, physical, emotional, social – and reasonable risks are essential for children’s healthy development” (p. 8). Learning to handle risks is a fundamental aspect of children’s cognitive and physical skill development and stimuli of this type are predominately found out-of-doors. Through outdoor play children gain developmental aptitude allowing them to recognize and be prepared for the challenges they will face throughout life (Frost, 2006).

Even in urban environments where children are typically limited to schools and neighborhoods and access to nature is limited, being outdoors is thought to provide benefit. For instance, Wells (2000) indicates that contact with nature, even being in a room with a view of nature, can help protect children against stress and increase children’s cognitive functioning. Another study found similar results suggesting that college students who had natural views from their dormitory windows were better able to direct attention when compared to their counterparts with less natural views (Tennessen & Cimprich, 1995). In addition, Wells and Evans (2003) note that “life’s stressful events appear not to cause as much psychological distress in children who live in high-nature conditions” (p. 322). Ulrich (1981; 1984) found similar results in the early 1980s confirming that people who watched images of natural landscapes after a stressful experience calmed markedly in only five minutes. In addition, a study by Grahn, et al. (1997) found that children in outdoor day care environments had better motor

coordination and greater attention than did children who attended urban day care centers surrounded by tall buildings. Researchers from a variety of disciplines have shown that the capacity to direct attention (CDA) is a crucial element in quality performance for students as well as adults (Bagot, 2004; Kuo 2001; Rockstroth & Schweizer, 2001; Taylor, Kuo & Sullivan 2001; Wells, 2000). According to Hartig, Mang and Evans (1991), “Poets, writers, philosophers, and artists have long held that natural settings are good for body, mind, and soul...More recently, researchers have begun to examine this belief in the salutary effects of nature” (p. 3).

A growing body of research demonstrates that natural environments can be restorative with regard to attention capacity (Bagot, 2004; Berto, 2005; Herzog, Chen & Primeau, 2002; Kaplan S. 1995; Kaplan & Kaplan, 1983; Tennessen & Cimprich, 1995; Ulrich, 1981). Research by Kaplan and Kaplan (1989) has suggested that exposure to the natural environment restores the ability to focus, concentrate, and direct attention when these capabilities are fatigued. Building upon the theory of restorative environments, S. Kaplan (1995) introduced the Attention Restoration Theory (ART). ART suggests that many of our daily interactions exploit critical capacities (e.g. direct attention, engagement, ability to pay attention, use of senses) needed for effective functioning. Kaplan suggests that the natural setting effortlessly engages our attention leading us to be attentive without the struggle to maintain concentration and thus leads to restoration.

Empirical literature on the proposed effects of natural environments provides reasonable confidence in Kaplan’s theory of the effectiveness of nature to enhance directed attention, engagement, and cognitive effectiveness. For example, Hartig et al.

(1991) found that backpackers who went on a wilderness trip had significantly improved proofreading scores while those that went on an urban vacation or no vacation at all did not change. In a second study, Hartig et al. (1991) had subjects perform focus tasks to induce attentional fatigue and then walk in either a natural or urban environment, or use passive relaxation techniques. After returning from their walk, those walking in the natural environments outperformed the others on a proofreading task. Further, research by Kuo (2001) found that relationships between nature, attention, and management of major issues intertwined. Attentional performance was systematically higher in individuals living in greener environments.

Additionally studies focused on children have shown similar results, children with Attention Deficit Disorder (ADD) reported milder symptoms in green settings (Taylor, Kuo, & Sullivan, 2001). In addition, a study conducted in Sweden found that children in more natural day care settings (e.g., pastures, woodlands, or orchards) had better attentional abilities and better motor coordination than children in typical urban daycare with human-made playground areas (Grahn et al., 1997). As stated above, research by Wells (2000) found that children moving into a neighborhood with more natural elements had the greatest ability to direct their attention. Wells conducted a longitudinal study of seventeen children in low income families. In the first phase the children lived in “poor housing” that typically was void of natural elements. In the second phase families were relocated to better housing in a more natural setting. Several months after moving in the new home Wells found significant gains in the children’s ability to concentrate (Wells, 2000).

For children in a school setting directed attention is required almost every minute of their school day to facilitate effective performance (Tennessen & Cimprich, 1995).

Taylor et al. (2001) advocated that children may need to be in natural environments even more than adults due to the fact that children's attention is not yet fully developed, making the ability to focus more difficult. Further, Francis (1988) makes a case that children's unstructured play in natural environments is vital to a genuine understanding of reality and that it cannot be replicated completely by other surroundings. For example, Sebba and Kellert suggest,

The natural world constitutes that singular place where life is born, grows, feeds, seemingly feels and thinks, and then dies. Even nonliving elements in nature, including the air, water, and landscapes, often seem life-like for most children, even if not precisely alive. The child intuits that these features support and sustain life, and though not an ecologist, he or she can readily observe that all creatures need water, that some animals eat plants and others eat other animals, and that the air is the irreplaceable foundation for life...no degree of finely executed fabricated or artificial product can fully replicate the vital, ambient qualities of living nature. (Kellert, 2005, p. 83)

Numerous studies have addressed other benefits of nature including: creative play, exploratory and divergent thinking, mental stimulation, sensory stimulation, the ability to work through issues, physical health benefits and mastery of child developmental skills (Kaplan & Kaplan, 1989; Kirby, 1989; Kuo, 2001; Moore, 1997; Nabhan & Trimble, 1994; Taylor, Kuo, & Sullivan, 2001; Trancik & Evans, 1995). Thus, the idea that nature is an important asset for healthy child development is well attested to within literature.

Review of Outdoor Programs and Nature Connections

Research indicates that outdoor learning environments naturally enable development of

cooperation, clear thinking and planning, careful observation, resourcefulness, persistence and adaptability... These responses are not demanded by the environment, per se, but rather the manner in which the program forces students to interact with the environment (Rhoades, 1972, p. 26)

A two year study completed by Martin (2004) investigated nature involvement of students in the outdoor education degree at La Trobe University, Bendigo Campus. The research examined the influence of outdoor education and culture on human-nature relationships, with particular attention to implications for human pro-nature concerns. The study concluded that outdoor education helped shape the participants' to an "increased sense of connectedness to, and caring for, nature (Martin, 2004, p. 21). For example, one of the students stated: "I care about nature heaps more than when I started the course. Even small things like recycling and stuff. Just from starting the course I watch how long I'm in the shower" (Martin, 2004, p. 21, Kate, interview 3).

A noteworthy finding within the study consisted of student's comments expressing the ways in which outdoor education helped them develop the knowledge and skills even to begin to shape a relationship with nature (Martin, 2004). Two significant categories emerged regarding factors that helped to positively shape their relationship with nature: (a) knowledge and application of outdoor language that enabled students to formulate discussion about nature; and (b) knowledge and skills for comfort and competence in the settings favored by outdoor enthusiasts (Martin, 2004). For example, in an interview reported by Martin (2004), Rick stated: "The lectures have given me a

way of explaining what I thought. Without the lectures I think I couldn't have explained what we've talked about" (p. 22). Martin (2004) further clarifies:

For students in this research, being introduced to concepts of human relationships with nature, and being able to talk about, describe and reflect on those relationships, greatly helped students conceptual understanding of their own relatedness to nature...Language enables consideration and understanding of human relationships with nature, but it does not dictate any particular direction for the ways in which relationships can develop, nor does language in itself give students something meaningful to talk about. As we expected, direct personal experience with nature was a key component of developing a relationship with nature and remains a cornerstone of outdoor education. (p. 22-23)

Additional studies report that students experience stillness, calm, and peace when participating in outdoor experiences (Loeffler, 2004). One participant stated, "Being outside, I really feel like a creature of the universe" (Loeffler, 2004, p. 543). A study by Henderson and Bialeschki (1987) found similar results suggesting that women were impacted by learning outdoor skills and that they found enjoyment in learning and practicing nature awareness. New outdoor skills and abilities were reported to increase feelings of self-confidence and reports of hikes in the rain and watching the lightning strike across the horizon were methods that fostered nature connections and appreciation (Henderson & Bialeschki, 1987).

Further results (Beringer, 1990; Hann, 1995, Kaplan & Kaplan, 1989) suggest enhanced awareness of self in relationship to the natural world as a result of outdoor education. For example, Attarian (1996) found that children's participation in outdoor programs gave them an opportunity to explore and shape their attitudes toward nature as well as themselves. Phencie and Griffore (2003) concluded that during the school-age years, it is vital to help children discover what has been termed as their ecopsychological

self: the child's natural sense of self in relation to the natural world. Other researchers suggest that outdoor educational programs teach children how to clarify values by helping them recognize the broader implications of their experience in relation to themselves and the natural world (Drury & Bonney, 1992; Simpson, 1993). In other words, children gain a better understanding of reality or real life experience. For example, children begin to develop a clearer understanding of danger and their own limitations by climbing a tree; they sense whether the next limb can hold their weight and how high they feel comfortable climbing (Simpson, 1993). Kahn (2006) advocates for the power of experiential outdoor education, he reports that it can sometimes be dismissed in the quest for intellectual influence, thus, he reminds us of John Muir's words:

I have a low opinion of books; they are but piles of stones set up to show coming travelers where other minds have been, or at best signal smokes to call attention...No amount of word-making will ever make a single soul to know these mountains. As well seek to warm the naked and frost-bitten by lectures on caloric and pictures of flame. One day's exposure to mountains is better than cartloads of books. (Muir, 1976, p. 318)

Summary and Hypotheses/Research Questions

In recent years children's access to nature has rapidly declined, leading to decreased relationships with nature. Children, especially those in urban environments, may come to rely upon outdoor programs as one means to foster a connection. Barlett (2005) advocates that children, in particular, do not form relationships to the environment; children form a relationship with a place in nature. Therefore, children have to be in nature in order to develop that relationship. As suggested by the literature, there exists an increasing divide between children and nature. In particular, urban

children would seem to be at greater risk of experiencing symptoms of a nature deficit than those residing in rural areas. However, this assumption has yet to be established through empirical research. Few studies have examined how the current generation of urban children view and understand nature. Even so, mainstream society and the majority of the field bank of the assumption of declining nature experiences and subsequent nature detachment. Therefore, possible interventions to increase nature exposure and provide re-connection to nature need to be identified.

Thus, the current study was designed to examine outdoor educational experiences as a possible method of reconnection to nature. In addition, the study sought to examine how the current generation of urban children view and understand nature. A urban school district and it's outdoor education center were chosen for study. Qualitative data from interviews and drawings were collected in order to address the following research question: What is the impact of an outdoor educational program on urban students' perceptions and connections to nature when compared to students who do not attend the program? The study tested the following hypothesis: Students who attend the outdoor education program will gain in positive perceptions of nature more than students who do not attend the program.

Methods

This study employed a quasi-experimental, concurrent triangulation mixed-method design (Hanson, et al., 2005) to test the hypothesis and answer the research question. This particular design involves the simultaneous collection and analysis of both qualitative and quantitative data. The use of multiple methods of data collection

within the study (i.e. interviews, drawings, surveys) and then cross-examination of those methods and subsequent conclusions supports trustworthiness of the results (Boyden & Ennew, 1997; Thomas & O’Kane, 1998).

Study Population

This study was conducted during the 2008-09 school year with the Houston Independent School District’s (HISD). HISD is the largest public school system in Texas and the seventh-largest in the United States educating approximately 202,000 students. The student population is 58 percent Hispanic, 30 percent African-American, 9 percent White, and 3 percent Asian/Pacific Islander. Approximately 78 percent of HISD’s students participate in free or reduced-price meal programs. HISD also serves more than 55,000 limited-English-proficient students who, combined, speak more than 90 different native languages (www.hisd.org).

Data for this study were collected from five different HISD schools, with three serving as program group schools (Atherton, Brookline, and Helms) and two as the control group (Foster and Oak Forest). Schools were selected based on when they were scheduled to attend the OEC. The program group attended the OEC in the fall 2008 semester, while students from the control schools did not attend the program during the fall semester, but were scheduled to attend the OEC program during the spring 2009 semester. Once data collection commenced the researcher discovered one of the control schools, Oak Forest, was a Vanguard School. According to the HISD website:

HISD's Vanguard programs serve students who have been identified as potentially gifted or talented in intellectual ability, creativity, or leadership. Vanguard offers a differentiated curriculum that is both accelerated and enriched.

Students typically study interdisciplinary units that emphasize higher-level thinking skills, problem-solving, and creativity (www.hisd.org).

Oak Forest is unique in that only half of the student population is in the vanguard program. The other half of the students are similar to all other HISD schools selected for the study. Demographics for the five different schools are listed in Table 2.1 on page 20.

A total of 381 5th grade students attended the five targeted schools; 326 (85%) completed the quantitative survey portion of the study. A randomly selected sample of 10 students (5 males, 5 females) from each of the schools (n=50) completed the qualitative portion of the study. Of the 326 students who participated in the study 174 (53.4%) were female and 152 (46.6%) were male. Race and ethnicity demographics were congruent with overall HISD demographics with 150 (46.0%) Hispanic/Latino, 100 (30.7%) Black/African American, 42 (12.9%) White/Caucasian, 6 (1.8%) Native American, 3 (.9%) Asian, and 25 (7.7%) were listed as “other.” The inclusion of an “other” category allowed students to fill in their race/ethnicity outside of traditional categorical limitations.

Program Description

The HISD’s Outdoor Education Center (OEC) facility is located 100 miles north of Houston in Trinity, TX, on 1800+ acres in what is known as “East Texas Big Thicket Country.” The land is thick with vegetation and wildlife. Facilities at this site include a dining hall, open air gymnasium, auditorium, indoor and outdoor classrooms, reptile room, library, nurse’s station, administrative offices, 22 heated/air conditioned cabins, swimming pool, low and high ropes courses, playing fields, and nature trails. Adjacent to

the facility is a PGA golf course utilized for instructing students through the First Tee golf program.

The OEC program was founded in 1977 and acts as an extension of 5th grade student's regular classroom by offering a hands-on, inquiry-based curriculum designed to teach children appreciation, awareness, expression, knowledge and skills related to the outdoors. Emphasis is placed upon direct experiences, life cycles, human relationships with nature and the responsibilities of stewardship of the natural earth. At the time of the study, the OEC was in its 32nd year and had served over 150,000 HISD fifth grade students since its inception. Currently, each year over 5,000 fifth graders participate in a 4 day, 3 night residential program with a typical day beginning with morning cabin chores, a quick interactive game, breakfast, and then participation in two morning instructional periods. Lessons could include activities such as pond studies, bird watching, model farm activities, forest study, map and compass, etc. Lunch is then provided and afternoon rest time follows. During this time students could be in their cabins, in the reptile room, on a trail, in the library or a list of other place with their cabin groups. Next, students go back into their instructional groups and attend two afternoon instructional periods such as canoeing, horseback riding, fishing, pioneer study, etc. and then go to dinner. After dinner there is another instructional period that involves activities such as night hikes, camp outs, astronomy lessons, first tee golf program, and more. Following these lessons students then go back to cabins, shower and get ready for bed. Storytelling and games go on until lights out. The OEC utilizes interactive, multidisciplinary curriculum to foster students' understanding of

interdependency: One person to another; One culture to another; People with nature; Things within nature.

Constructs and Measures

Both quantitative and qualitative data were collected in order to provide different perspectives on the 5th graders' nature perceptions.

Quantitative Data. Quantitative data were collected via the Perceptions and Connections to Nature Survey (PCN; Appendix A) developed by the project researchers. The development of the PCN was influenced by the Connectedness to Nature Scale (CNS; Mayer & Fantz, 2004) and the Children's Environmental Attitude and Knowledge Scale (CHEAKS; Leeming, Dwyer, & Bracken, 1995). Questions were pooled from CNS and CHEAKS and then adapted to fit the scope of this study. In an effort to increase content validity, TAMU professors, graduate students, and twelve certified HISD 5th grade teachers proposed and reviewed survey items.

After feedback and revisions, the PCN consisted of 25 items designed to assess children's nature perceptions. In addition, HISD requested that 5 items be included to test children's knowledge related to Texas Essential Knowledge and Skills (TEEKS) state mandated science curriculum, thus making the PCN 30 questions total.

Each item in the survey was designed to fall into one of four sub-categories of perceptions of nature: knowledge, feelings, attitudes, and behaviors. The categories were defined as follows:

- Knowledge - relevant information that one is able to recall from memory (e.g., Can you name a wild animal that you might find in the woods?)
- Feelings - expressing an emotion about a topic (e.g., I wish that I could spend more time in nature).

- Attitudes - beliefs, values and dispositions leading one to act in certain ways (e.g., I believe that nature is important).
- Behaviors - the actions of people (After school I usually spend my time inside).

There were 6 and 10 items for each construct. Davis (1989) suggested including at least six to seven items per construct for reliability. Some researchers contend that more than 10 items leads to redundancy and respondent fatigue (Bhattacharjee, 2002; Boyle, Stankov & Cattell, 1995). Both positive and negative formulations of the survey questions were included in an effort to avoid patterned responding (Kals, et al., 1999). Items were formatted Likert –type scales (1=strongly disagree to 5=strongly agree). The survey took approximately 10 to 12 minutes for students to complete.

Qualitative Data – Interviews. A semi-structured interview guide (Appendix B) was also utilized to explore students’ definitions and perceptions of nature. The questions paralleled the four areas of inquiry used in the PCN survey, including participants’ knowledge (e.g., What is nature to you?); feelings (e.g., How do you feel when you are in nature?); attitudes (e.g., Do you think nature is important? Why?); and nature related behaviors (e.g., What sorts of things do you like to do afterschool?). The interview guide was developed to enable differing cultural expression related to the children’s understanding of nature (Wilhelm & Schneider, 2005). In other words, when I say the word nature as a white rural female, its meaning may be very different to me than to an urban, minority student. Thus, instead of assuming that all definitions of nature are the same and asking questions as such, the first question asked of all participants is “what is nature to you?” This approach was employed because views of the world around us are not a fixed set of values or realities, and in understanding or

constructing meaning, especially of a construct as complex as nature, it was necessary that it be examined in the everyday life and voice of the child from their own perspective (Patton, 1990; Marshall & Roosman, 1999; Merriam, 1998; Sale et.al., 2002).

Qualitative Data – Drawings and Descriptions. The third method of data collection employed a drawing activity (Appendix C) as an additional way of tapping into children's' understanding of nature. Participants were given a blank sheet of paper and asked to draw "nature." After completing the drawing, the student was asked to describe the drawing to the researcher. Drawing is a recognized form of communication for young children. Studies have found that drawing facilitates children's ability to talk during the interview process (Driessnack, 2005; Gross & Hayne, 1998; LaGreca, 1990; Stafstrom, Rostasy & Minster, 2002; Wesson & Salmon, 2001). In a study utilizing drawings, Theis (1996) noted that

Children often did not respond when addressed directly by an adult. Using an intermediate medium, such as pen and paper, a diagram, pictures, a ball or a toy in communicating with children immediately broke down these inhibitions (p. 72)

Most children do not sit down like adults do to participate in a conversation; children play. Therefore, allowing children to play as they communicate helps to increase their comfort level when talking to someone new. Yuen (2004) points out that, "When involving children in qualitative research, one of the major challenges is for the adult investigator to capture the experiences and meaning from the children's perspective" (p. 1). He also suggests four contexts in which drawings can contribute to a better understanding between researcher and interviewee including: facilitating a relaxed atmosphere; gaining insight into the children's perspective; providing structure and

focus to the discussion; and recognizing and reducing the potential of group think (Yuen, 2004). In addition, Fury, Carlson and Sroufe (1997) point out that for concepts such as nature, when it may be difficult to assess or express meaning, drawing can be beneficial:

Drawing is a natural mode of expression for children ages 5 to 11; long before youngsters can put their feelings and thoughts into words, they can express both conscious and unconscious attitudes, wishes, and concerns in drawing. (Fury, Carlson, & Sroufe, p. 1154)

Drawing is a non-verbal language, which allows for a more precise means of communication, especially among those participants who are English language learners.

Procedures

Both pre-test and post-test data were collected. Pre-test data were collected the week of November 10-14, 2008 at all program and control schools. These dates were selected since the children from the program schools were going to the OEC the following week. Post-test data were collected at all schools one month following the program group's participation in the OEC program. Methods for collection of pre-test and post-test data were similar.

Data were collected on the campuses of participating HISD schools; parental consent and student assent were obtained. The PCN survey was administered via a paper/pencil survey; a Spanish version was available to students if requested. The surveys were administered either in the student's classroom or in the cafeteria. The semi-structured interviews and the drawing activity took place in a classroom or office near the student's classroom following completion of the survey. Interviews lasted approximately 10 minutes per child and were voice recorded. For each selected child, the drawing activity and interview occurred during the same session. Students were given a

blank piece of paper, crayons, and colored pencils and asked to “draw nature” while waiting to be interviewed. Descriptions of the drawings were done after the interview for those students who were interviewed first and before the interview for those who were interviewed last.

Results

Results are reported for each of the methods used to solicit student input.

Survey Results

Of the 326 students surveyed, 266 completed both the pre-test and post-test measures, with 131 from program schools and 135 from control schools. Exploratory factor analysis (principal axis, followed by Varimax rotation for factors with eigenvalues ≥ 1.0) was performed to determine the scale structure that best suited survey responses. The analysis resulted in five factors with alpha reliabilities between .58 and .76. The factors explained 57.1 percent of the variance. The five factors were: (a) nature importance; (b) nature affinity; (c) nature disconnect; (d) environmental ethic; and (e) ownership of nature belief. Two items (19 and 21) were not included in the final factors due to the overlap of loading between several of the factors (e.g. I spend time in nature everyday; After school I usually spend my time inside). Both items had to do with actual behaviors that parents had control over regardless of student’s nature perceptions. Results of factor analysis are shown in Table 2.2 on page 26. Nature importance was linked to student’s belief that nature was important and should be protected. Nature affinity items represented students’ desire to spend time in nature or feelings that they were a part of nature. Nature disconnect denoted students’ fear, anxiety, and separation

from nature. Environmental ethic related student's environmental behavior such as, recycling, turning off the water, etc. Ownership of nature belief represented students' desire to take a stand regarding their thoughts about nature. After accounting for reverse coding for some items, high scores were representative of positive nature perceptions.

Analysis of pre-test and post-test measures across the developed scales were examined using a group (program versus control) by time (pre-post) repeated measures design. Only the environmental ethics scale produced a significant change from pre-test to post-test means ($p=.035$), with the program group increasing .10 from the pre to post-test and the control group mean decreasing .19. Interestingly, the control group score environmental ethics score decreases from the pre-test to post-test. A possible reason for this finding could be the timing of the data collection. Science issues are discussed as part of the 5th grade curriculum. When collecting pre-test data from one of the control schools (Oak Forest) student drawn pictures and statements about environmental issues were displayed in the school halls. Thus, the information may have been fresh in the students' minds during pre-testing.

Overall on the scaled items, nearly all program group means increased from pre-test to post-test scores, with the exception of ownership of belief dropping .05. In addition, overall knowledge scores ($p=.084$) and nature affinity score changes ($p=.10$) were heading in the right direction with significance levels less than or equal to .10. For knowledge scores, the program group increased from .58 to .66, while the control group increased from .73 to .77. For nature affinity, the program group increased from 3.86 to 4.01 while the control group increased from 2.70 to 3.90. Results are shown in Table 3.1.

TABLE 3.1
Repeated Measures Pre-test Means, Standard Deviation, and Significance Levels

		Pre-test Mean	SD	Post-test Mean	SD	Interaction Effect Significance
Nature Importance	Program	4.28	0.72	4.38	0.59	0.38
	Control	4.28	0.66	4.28	0.66	
Nature Affinity	Program	3.86	0.81	4.01	0.71	0.10*
	Control	3.70	0.98	3.90	0.81	
Nature Disconnect	Program	3.47	1.10	3.88	0.87	0.55
	Control	3.64	0.88	3.80	1.01	
Environmental Ethic	Program	3.69	0.96	3.74	3.70	.035**
	Control	4.02	0.88	3.83	3.80	
Ownership of Belief	Program	3.79	0.94	3.74	0.98	0.57
	Control	3.57	0.95	3.58	1.15	
Knowledge Score	Program	0.58	0.21	0.66	0.23	.084*
	Control	0.73	0.17	0.77	0.15	

**p<.05, *p<.10 (All items were reverse coded and high scores indicate pro-nature behaviors)

Interview Results

Atlas.ti.5.2 Scientific Software 2007, was employed to organize, code, and generate themes utilizing the constant comparative method (Lincoln & Guba, 1985). Open coding was completed by the researcher, two graduate students, and one professor. Interview data for both the program and control groups were separated into four categories: knowledge, feelings, attitudes, and behaviors (Table 3.2). Under each grouping the relevant themes are listed with a short description of each. Four themes emerged in the knowledge area, six for feelings, four for attitudes, and five for behaviors.

Program and control group responses were comparable during the pre-test interviews. Thus only one pre-test quotation is listed. The similarity in responses suggests that for students in the program and control groups their initial-existing definitions and perceptions of nature were similar. Corresponding analysis of post-test interview responses indicated divergent responses between the program and control groups. Therefore, each table contains a representative quote for both the control and program post-test results (Table 3.3).

TABLE 3.2
Qualitative Themes Associated with Interview Guide Concepts – Knowledge, Feelings, Attitudes, and Behaviors

Interview Themes	Description
Definitions/ Knowledge of Nature	
Natural Elements	Students defined nature most often by mentioning natural elements such as trees, plants, animals, or flowers. In addition, nature was referred to as the wild.
Outdoors/Outside	Students stated that nature is outdoors or outside. Often an activity was expressed, e.g., camping or playing outside.
Nature is Not The City	Students reported that nature is separate from the city; a lack of civilization.
Unique Answer	Students described nature in a unique way; feeling full in nature, nature as part of them, a new exciting world.
Feelings Related to Nature	
Freedom	Students reported that they have time to play. Play is unstructured; they choose whether to be active or to rest. Expressions of freedom from stress, rules, home life, etc.
Fun	Students expressed that nature is fun or that it gives them a feeling of excitement and fun.
Fear	Students responded that they had feelings of fear towards nature. They could possibly get lost, hurt, or attacked by animals.
Tranquil, Peaceful, Time of Reflection	Students reported that nature gave them a peaceful, calm, relaxed feeling and that often they would sit and write or draw to express themselves
"That Feeling"	Students had trouble expressing how they felt about nature in words. When students responded this way it was always a good feeling.
Separation from Nature	Students reported that on a daily basis they had little or no contact with nature.
Attitudes Related to Nature	
Makes you Healthy/ Exercise	Students thought that nature provided a way to get healthier and that you got more exercise than inside
Need to Protect	Students expressed a desire to protect nature.
Importance	Students stated that nature was important. They had a difficult time explaining why it was important or else they gave an environmental type answer.
Desire to Learn More	Students desired to learn more about nature and to develop a greater understanding of all that is around them.
Behaviors Related to Nature/Outdoors	
Choose Outside	Students when asked about free-time after school overwhelmingly chose to be outside. Freedom, adventure, and more to do where some of the reasons expressed.
Choose Inside	Some students chose to be inside when given an option of free-time. Reasons expressed where fear of outdoors, desire to play video games and watch TV, and the heat of the outdoors.
Active Outside	Students across the board reported being active outside. At times they may sit under a tree or stare at the stars but part of what they expressed enjoyment about being outdoors was that they got to run and be active.
Inactive Inside	Students reported inactivity when indoors. They reported sitting and watching TV or playing video games.
No Choice	Students described that they although they might choose to go outside, they often don't get to choose.

TABLE 3.3
Representative Quotes for Pre-test and Post-test – Definitions/Knowledge of Nature

Definitions/Knowledge of Nature	Pre-test	Post-test Control Group	Post-test Program Group
Natural Elements	When I think of nature I think it's mostly about where trees, uh, where a certain place is filled with trees and animals that could live their life free.	Nature is something that I believe we live off of. Like for the trees and stuff let us breathe and stuff. Without trees a lot of people can get killed and stuff.	Nature to me is like when you have a lot a trees and you can smell fresh air and birds flying free around and you can see the trees like there's different ones, short, tall, large skinny, smooth and rough. Like the bugs and daddy long legs. You know I picked one up before!
Outdoors/Outside	I think of the outdoors. Like what nature means...when you go outside and go camping in the backyard.	Nature is outside. It's exploring things I never saw before. <i>Do you go into nature a lot?</i> No, My momma don't let me. She just say just stay home and play your game.	Nature is what all the things do outdoors. Like the birds and trees and animals like everyday outdoors over there at Camp (OEC)
Nature is Not The City	Nature is trees, wild animals, and, um, things other than the city. Um, untouched by civilization places	I've been on campouts, but where it's where there are modern conveniences, not like out in the wild.	Nature is trees, animals, the wild, and, um, things other than the city.
Unique Answer	Well, nature to me, it's part of my land. Or the part of the land that history means. Nature, it's out there where the lions be. It's out in the open. And lions be out there, Zebras. And all other things cuz I seen it on TV. Umm, Chanel 8. They showed nature and that's all. <i>Do you ever see nature yourself when it's not on TV?</i> Not really, Um not really.	Nature I would say it's something that people can enjoy and what most people around the world wish they could live in.	Nature is energy. The wind blows and I just feel alive and I don't have to worry about being tired sometimes when I'm around trees a lot.

Definitions and Knowledge

Natural elements such as trees, plants, and animals were listed most often when the children were asked to describe nature. On the post-test the control group (CPT) often reported that natural elements, such as trees, were needed and useful to people. The program post-test group (PPT) more often responded by listing the different types of natural elements exposed to and further relayed information about the experience. The second sub-theme defined nature as outdoors/outside by students and remained consistent in both CPT and PPT. Students often used the words nature and outside interchangeably. Nevertheless, students within the PPT interchangeably reported the distinction between outside at the OEC, “the real nature” and outside at home.

The third sub-theme, nature is not the city, was mentioned in both the CPT and PPT responses for each group, no significant change was found. Nature defined as a unique response increased for the PPT. One program student responded, “Nature is a part of me now, like I’m more connected to it.”

TABLE 3.4
Representative Quotes for Pre-test and Post-test – Feelings Related to Nature

Feelings Related to Nature	Pre-test	Post-test Control Group	Post-test Program Group
Freedom	That I can have free time and I won't have to worry about sharing anything or having to play with play when I don't want to. Sometimes I play by myself, like with my imaginary friends or sometimes I'll just sit under a tree	It feels like there is more air or something and you feel a little bit free'er than you do inside.	There is so much more space. There is no limit. You can go anywhere and there's no civilization, you know.
Fun	Nature, I think it's just a really fun place to go.	Nature to me is like a fun word. Like its gonna be outside.	I don't know I can't explain the feeling. It feels good, but I can't explain it. It's like a magical moment. It's exciting cuz there's new things to experience every time you go.
Fear	It made me scared cuz it was my first, my very first time. I was nervous about, there were like things, there were big things crawling around me and I might get lost. I might not find my way back.	There are too many rocks and you could get hurt. And inside you have a coach to play with to watch over you to make sure you don't get hurt.	I like didn't like it (nature) before I went to the OEC. It was like, I was kinda nervous and I was kinda scared but I feel now, I feel more comfortable in nature. We went in the woods and hiked at night and stuff. Yea!
Tranquil, Peaceful, Time of Reflection	I don't really remember but it was a certain spot and I didn't tell anyone where I was. And that was where I just calmed myself down whenever I had a problem. My favorite things is to draw what I see and what I feel.	It's relaxing cuz like we by ourselves we could hear different stuff that you've never heard before. There's a few little things, like people tell you, like bears in the nature and stuff and if you see one they could just get away but if you don't you'd be relaxed.	It's so relaxing I can play or have a picnic in peace. Lay around, watch the sky and the clouds, and draw pictures of what I think.
"That Feeling"	My favorite thing about being outside is really seeing everything together. You know, like how every, how everybody's playing, like acting as one community, not just sitting around playing video games inside.	I like about nature is that feeling that your outside and like you can see all the things that you can't see like at the house.	I think it's very tranquil, very peaceful. Uh, I don't know how to put it into words. I think people should go there. You could play and you could...it has a lot. I've been outside and I've just stared at all the trees. I have that feeling. It feels. It's a good feeling. I feel really happy.
Separation from nature	I play outside by the dead end. I make the rounds. Like Biking. <i>How do you feel when you are outside around nature?</i> Um, I can barely feel it...nature.	I think most of the nature is pretty far off from where I live.	We don't really get to go out any more than before but I can still remember it.

Feelings Related to Nature

Notably, the most change from CPT to PPT responses occurred regarding feelings towards nature (Table 3.4). In general the CPT tended to discuss feelings about nature broadly, with few specifics. Statements were made such as, “I think I would feel” or “something like that” or “like people tell you.” Unless students had previously been directly exposed to nature their feelings about nature followed a generic response. For example, “I feel like nature is important, cause, um, well, uh it helps us, uh I don’t really know.” On the other hand, students in the PPT reported their feelings toward nature with zeal, for example: “It’s like a magical moment” or “I have that felling...it’s a good feeling, or “It feels like freedom, I can actually just play, you know.”

One area of stark contrast in the CPT and PPT responses were feelings of fear in nature. The PPT post-test responses frequently commented that initially they were afraid of nature but now that they had been exposed to nature they felt more comfortable. Both CPT and PPT reported that nature was tranquil, peaceful, or relaxing. However, the PPT commented on specific times of reflection in nature, such as “I just would go in the woods and just calm myself down by looking at the trees and stuff...I could think.” Repeatedly members of the PPT group mentioned lying down and looking at the sky or sitting under a tree and thinking. Lastly, both groups reported feeling separate from nature. However, PPT group tended to mention the OEC experience. For example, “At school we are inside still but I imagine it like it was back there (at the OEC)” or “I feel more connected to it now, like I know what it (nature) is.”

TABLE 3.5
Representative Quotes for Pre-test and Post-test – Attitudes towards Nature

Attitudes Related to Nature	Pre-test	Post-test Control Group	Post-test Program Group
Makes you Healthy/ Exercise	Because inside you can't get enough health. They say if you play outside more you can get healthier and healthier every day.	Dream Academy is a place that teaches us more about, uh, how to be responsible. Like we go outside and sometimes we might get to play.	You can like do more things outside and I would prefer to do more active things than just be sitting around. You are just more active and feel healthy.
Need to Protect	Cuz like my cousin they always tell me, like he showed me like nature and cuz, and then, like sometimes I feel bad for what they, well not bad for what they say but like what happens to nature. Cuz like we're always duping it up.	We should take care of animals and the habitat and stuff.	You gotta respect nature! I'd really like to go to city hall now and try to stop them from cutting down more trees.
Importance	Because, like, nature gives us, like, well kinda a little bit. I don't really know about nature, but I've learned that it gives us... wood gives us pencils, paper, and everything. And usually like the dirt helps us, like, I don't really know.	It is an important environment that helps us breathe. And animals and plants that produce food for us.	It is very important. There is a lot in nature, like birds, squirrels, and they have babies and we gotta understand that you can't cut down trees cuz it is where they live.
Desire to Learn More	I'm excited cuz like my cousin she tells me like you could learn things, about, just by looking at nature. Like, for example, like how trees grow. Or you could find out about plants. Or how the dirt gets minerals and stuff like that.	I would really, I want to see like different types of birds cuz birds that you see here it's all one type of bird.	I feel happy because I am kinda connected to it (nature) now. I'm gonna be like free. I'm gonna learn from, uh, like discover. Like the plants, the names of trees. Like How it would feel like to live in the woods or forest.

Attitudes towards Nature

Slight changes were noted in students' attitudes towards nature (Table 3.5). The PPT responses suggested more feeling and meaning behind statements of nature importance and the need to protect nature. Such as, "it's important because lots of stuff lives there and it's a special, uh, pretty place to go" or "you gotta respect it cuz it's part

of us, they been telling us a lot you would never know about nature like it's a lot, not just recycling and stuff." CPT responses followed a more socialized response; "we need nature to breathe and stuff" and "to recycle so we don't run out of water." Even so, both groups consistently commented on the need to protect nature and nature's importance. Nature and the outdoors were also viewed as ways to exercise and enhance one's health. One noteworthy finding from both groups was that structured exercise, team sports, or planned activities were not commented upon in this section. Students commented on unstructured spontaneous activity such as racing, hide and go seek, and biking. A minor difference in control group responses was that sometimes the statements stopped with no explanation. For example, "I choose outside." On the reverse, PPT groups often gave an explanation (i.e. "Outside, because there is so much to do and it's never boring cuz you can explore and run around and you can't run inside"). Both groups reported a desire to learn more about nature. Excitement, exploration, and discover were common words used to express interest in finding out more about nature. Even when fear was present student interest remained high. For example, "You never know what is gonna be out there, like a bear could eat you, but I still wanna go because I seen pictures and stuff." On comparison of CPT and PPT, the PPT notably expressed an enthusiasm above that of the CPT. For example, "It's like a whole new world now, like, um, I never knew it existed. I think, uh, now I might be a scientist if I don't make it to the NBA."

TABLE 3.6
Representative Quotes for Pre-test and Post-test – Behaviors Related to Nature

Behaviors Related to Nature/Outdoors	Pre-test	Post-test Control Group	Post-test Program Group
Choose Outside	Outside...my favorite thing about nature is that it's sometimes its peace and quiet, but sometimes it's exciting and full of life.	I would choose outside because I burn more calories	Inside is a stuffy and you just sit down and watch TV but outside is fresh air and there is lots to explore.
Choose Inside	Inside...because you don't know what's out there? Like animals that that's not that good that destroy people or people, like, when they hurt people.	Inside because I can play the Playstation and hand controller game.	I think inside so I could watch TV, cause sometimes people outside that could hurt people.
Active Outside	I feel very active and I feel, um, I feel like it's, you know, you just, it's a carefree world. You just go out and play	We play hide and seek and we race, kickball and stuff.	I go outside now. The fact that I can just be outside and playing and running around.
Inactive Inside	I stop by the store and get me some junk food and then I go home. And I just sit down, do my homework, and then I get on the computer or sit down and watch House of Pain	I just go inside and sit down and watch TV and go to bed.	Inside I just play video games or do my homework.
No Choice	I just go home and have to stay inside; I don't really go outside that much. Sometimes on the weekends, yeah, sometimes.	I have to help with my brothers and sisters at home until my parents get home from work. We stay inside house.	I'm not allowed to go outside by myself because my mom thinks I could get hurt.

Behaviors Related to Nature

Behavior questions were asked in regards to nature when possible; however, many times the word outside was substituted for nature because of a lack of access to natural settings (Table 3.6). For example, “If you had some free time would you choose to be inside or outside? Why?” and “What sorts of things do you do after school?” and “What about when you are outside?” (or inside). Due to the fact that 5th grade students

do not choose where they live, natural setting may not be easily accessed. Even so, information about after school preferences and free time choices provided insight. Overwhelming, students reported that they would chose outside during their free time. Reasons why include, “so much to explore,” “lots to do and see,” “less rules...you can play and not worry about breakin somethin” and “I can choose to play or not play, like, sit under a tree.” Once again, although little change was noticed in the desire to spend time outside, the PPT offerred responses with more interest in the outdoors than the CPT. For example, “I could look for more bugs like at the camp (OEC); maybe I could start like a bug collection.” Another factor that stayed relatively consistent were student’s comments that they were active outside running, playing, and biking or skateboarding. Some did report choosing inside and the reasons included watching TV, playing video games, or concerns for safety. Inactivity was associated with being inside; TV, video games, and the computer were listed as what students did while inside. Differences in the PPT responses included less fear and more effort to spend time outdoors. For example, “I like to go outside more now, but it kind of, like, well if I’m allowed to and stuff...like my mom said I couldn’t keep the turtle I found cause we gots too much stuff already.” As stated above, 5th grade students do not have much choice in where they spend their time. Often parents would not allow students to be outside or to walk to a park because of safety or sibling responsibilities.

TABLE 3.7
*Representative Quotes for Emerging Themes from Pre-test and Post-test Interviews –
 Direct Experience*

Experience with Nature	Pre-test	Post-test Control Group	Post-test Program Group
Direct Experience	I've gone camping 3 times with the girl scouts before. I went to somebody's, some of the girl scout camps. It was, we had cabins and, um. We had like we didn't have lights in the cabins and stuff. And there's some places where you can just go in the wilderness and you find little sitting places. And it's pretty cool. It's so quiet and so peaceful and you just think, it's you; just thinking about the city and how it's so loud and then...you just have peace and quiet.	Let's see, a forest hike! We went hiking at Tom Bass Park. I got some, I got to see the animals, the new plants, everything. I went with my parents.	I went hiking at camp (OEC). And then they let us get lost and use a compass so we can, like come back. I liked getting along with nature and being with nature...like get reunited in nature. It was more peaceful. There was no, like there was no noise over there. There was just like the animals.
No Experience	<i>Can you tell me about a nature experience or about a time that you were in nature?</i> No, I don't really think so. <i>Ok, Do you go outside at all?</i> Not that much.	<i>Can you tell me about a nature experience or activity in nature that you have taken part in?</i> None. <i>Have you ever been in the wood?</i> No. <i>To the beach?</i> No. <i>Climbed a tree?</i> No. <i>So you just don't think you have had much exposure to nature?</i> No it pretty far away from here. <i>Where is it?</i> Africa.	No comments

Emerging Themes from the Data

The most significant finding from student interview responses, pre-test or post-test and program or control group, was that direct experience seemingly had the greatest impact on students' definitions and perceptions of nature (Table 3.7). In other words, those students who recalled direct exposure to nature responded in ways that would suggest a high affinity towards nature. When asked by the researcher about a nature experience, their responses were descriptive, enthusiastic and memories/meaning was attached to the word nature. Many of the descriptions are too lengthy in detail to be

quoted and often family members or friends were highlighted as spending time with them in nature. What is interesting is that students in the program group (PPT), that attended the OEC, no longer had any comments under the category of no experience with nature. This finding suggests that students associated the OEC experience with direct exposure to nature. Students in the pre-test group and those in the control group who had no previous experiences in nature responded to questions about nature from secondary knowledge sources such as, school books, the internet, or others interpretations. For example, “I don’t know what nature was so I Googled and Wikipedia-ed it....You should go look at nature images on Google, it has lots of nature stuff.” Findings suggest that these students responded in a manner that would be linked to nature deficit. For instance, when asked about a nature experience they consistently replied “I haven’t ever been in nature” or “no cuz I am not around nature” or “I can’t really think of any.” As stated above, this finding was not apparent in the PPT.

TABLE 3.8
Representative Themes from the Data – Program Group Post-test Only (PPT)

Program Group Only	Description	Representative Quote
Change since OEC	Students reported more excitement about nature and less fear. They described a better understanding of what nature is and a desire to learn more and do more where nature is concerned.	Um, I started getting into it (nature). Um, all that time that we were outside. I started getting used to it. Um, like whenever you get a mosquito bite you don't really care cuz you're already outside. In camp (OEC) it felt more fun like, uh, I felt like I knew nature and I and at home like just walking on the concrete it makes everything different. But, uh, well, I didn't like to go outside, but now like that I've been over there I like to go more outside.
Desire to go back to OEC	Students desired to go back to the OEC and for other students to get a chance to go because they thought it was a good experience for them. Several of the students mentioned they might want to work as a teacher at the OEC.	I want to go back to Camp Olympia (OEC). I could work there, like teach, maybe when I get older. It's fun, you know, you get more used to nature. They'll teach you think you might not have ever known... but, um, there sometimes you just sort of watch and figure things out.

Representative Themes from Program Group Post-test Only

Students reported perceived changes in their own understanding and perceptions of nature as a result of the OEC program (Table 3.8). In addition, students expressed a desire to go back to the OEC as well as a concern for other students to have the opportunity to get to experience the program.

Qualitative Findings – Drawings

Drawings were rated by a panel of 17 professionals at the 2009 Texas Experiential Ropes Association (TERA) conference and also by 43 students in one of the outdoor related courses at Texas A&M University during the spring 2009 semester. Data

were further analyzed by the researcher and 2 fellow graduate students and a rating scale was developed and applied to each picture (Table 3.9).

Based on the drawing descriptions, each picture was rated as either as a real place, imaginary place or both a real and imaginary place in nature. For example, a real place would include a student's reported nature experience (e.g. I drew the lake where I went fishing with my grandpa.); an imaginary drawing would include a made-up natural place (e.g. I drew what I imagined my backyard to look like); and a drawing that consisted of both real and imaginary included a real place with an imaginary experience (e.g. I drew the OEC and my family and I riding in the boat). Drawings were rated on a scale of 1=least natural to 3=most natural. For example, drawings with a 1 rating were nonspecific general drawings of nature that often included manmade elements (e.g. a playground play structure, a sidewalk, buildings). Drawings rated as a 2 consisted of more natural elements such as trees and plants yet many of the elements were out of context (e.g. a shark in a pond in the forest or a grizzly bear in a fenced backyard). Lastly, those drawings rated as a 3 were detailed drawings consisting of many natural elements, often of a specific natural place. (e.g., an Uncle's ranch with a creek and grassy hills, trees, birds, etc.)

Results suggest minimal change in ratings for the control group's drawings from pre-test to post-test with only two students moving from rating 2 to 3 (Table 3.9). In addition, imaginary and real ratings stayed consistent with only one less imaginary drawing and two additional category 3 drawings. On the other hand, the control group ratings increased to 79.2% moving to category 3, compared to 29.2% for these same

students on the pre-test. In addition, 54.1% drew a real or real and imaginary place, up from 16.7% pre-test. These finding suggests that the OEC experience had a substantial impact on student's nature drawings.

TABLE 3.9
Analysis of Pre-test and Post-test Drawings

Pre-test Drawing Control Group			Post-test Drawing Control Group		
	N	%		N	%
Rating 1	5	25	Rating 1	5	25
Rating 2	8	40	Rating 2	6	30
Rating 3	7	35	Rating 3	9	45
Total	20	100	Total	20	100
Imaginary	15	75	Imaginary	14	70
Real	4	20	Real	4	20
Unknown	1	5	Both	2	10
Total	20	100	Total	10	100
Pre-test Drawing Program Group			Post-test Drawing Program Group		
	N	%		N	%
Rating 1	5	20.8	Rating 1	1	4.2
Rating 2	12	50	Rating 2	4	16.7
Rating 3	7	29.2	Rating 3	19	79.2
Total	24	100	Total	24	100
Imaginary	19	79.2	Imaginary	11	45.8
Real	4	16.7	Real	11	45.8
Unknown	1	4.2	Both	2	8.3
Total	24	100	Total	24	24

Three representative drawings are illustrated in Figures 2.1, 2.2, and 2.3 on pages 35, 36, and 37, respectively. Additionally, the descriptions of the drawings are also included. Each represents a 1, 2, or 3 on the rating scale observed in Table 3.9.

Rating 1 – “Generic” Imagined Drawing of Nature, No Experience. Drawings often included basic natural elements and students explained that this is what they had

heard, seen, read or thought nature to be. Most drawings included manmade elements such as swimming pools, playground structures, or sidewalks. Refer to Figure 2.1 on page 35.

Rating 2 – Imagined Drawing of Nature, Little or No Experience. Drawings were detailed and had lots of animals, people, or objects. Most often items were out of place and or context. For example, sharks, dinosaurs, gorillas, etc were placed in the forest along with squirrels. Refer to Figure 2.2 on page 36.

Rating 3 – A Real Place in Nature or Real Experience. Some students drawings were specific and detailed others were simple and particular in natural content only. Descriptions were often lengthy and the memory of the experience was recounted with excitement. Refer to Figure 2.3 on page 37.

The descriptions attached to the drawings indicate that all of the students who drew a real nature place also described a real direct experience in nature. This finding suggests that direct experience is a key influencing factor in students understanding of nature. For instance, when a student drew a real place in nature and described their experience, it was detailed and unique to that natural setting. Conversely, those drawings that were imagined were general ideas of natural places, thought possibly to exist “far away from here” (Houston). When pre-test and post-test drawings were compared program student’s drawings went up on ratings and also many changed from imagined drawings to real drawings with 11 of the 24 drawings depicting the actual OEC landscape. In the control group the majority of the students drew an imaginary nature place pre-test and post-test and numerous students’ drawings presented minimal changes

from pre-test to post-test. In addition, those students in the program group who did not attend the OEC (parents did not allow them to attend, taken out of the SPSS analysis) additionally confirmed the matching pre-test and post-test drawings. Representative drawings and descriptions are included below in Figures 3.1-3.6.

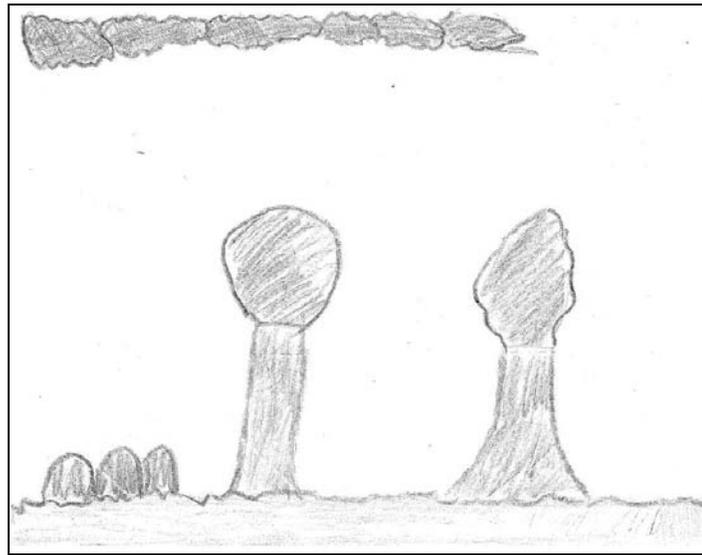


Figure 3.1. Pre-test 1.

R: It's this is about the nature the natural, the nature. And it's about the sky and the wind is coming. It's getting foggy and it's gonna rain. It has a tree and leaves and the sun.

I: Okay, is this a made up place or a place you have been to?

R: Made up, I imagined it. Like, um, the tall tree and uh, it don't get cold at my house.

I: What does it look like around your house?

R: Uh, it's a street and it's houses on all sides. And um the grocery store if you go straight across.



Figure 3.2. Post-test 1.

R: It has the sky and clouds.

I: Okay, what is this?

R: Wind and bushes and 2 trees and um, you can see the wind in the grass.

I: Is this a real place or a place that you made up?

R: I made it up.

I: You said earlier you didn't get to go to the OEC, correct?

R: Yea, um, I didn't get to go, um, because my parents thought I would get hurt or something. I just, uh wanted to go.

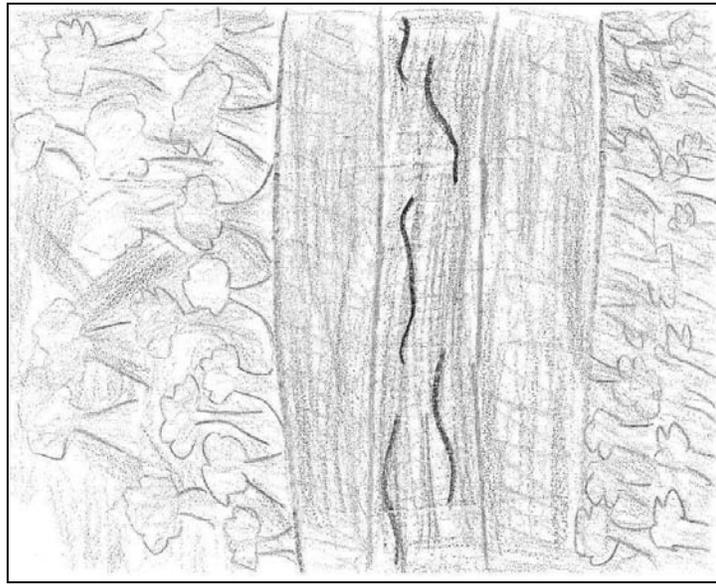


Figure 3.3. Pre-test 2.

R: Well, it's a lot a trees. And it has a river through the middle so, and some grass. Plain grasslands right next to it and then on the other side there's some more trees.

I: Okay, and what is this?

R: The Sun.

I: Is this a place you have actually been to or a place you imagined?

R: Well, it's like what I think of the forest uh, could be. I made it up.

I: What sorts of things would you do if you were in the forest?

Go swimming in the river, uh, climb on threes and play around.

I: Do you think there are place like this around where you live or are they pretty far away?

R: Yeah, um far away.

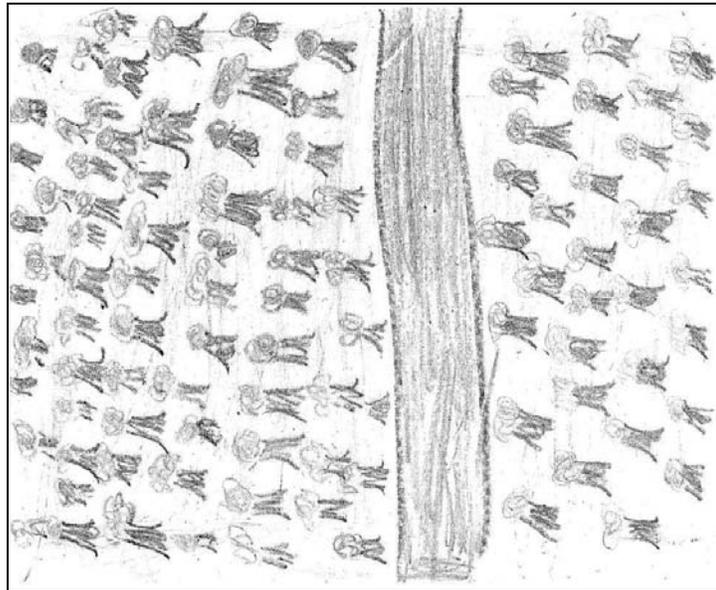


Figure 3.4. Post-test 2.

R: Uh, it has a bunch of trees, but in the middle it's cut off by a river.

I: Okay, is this a place you have been to or a place that you imagined.

R: Uh, yes I imagined.

I: What would you do if you were there?

R: I would probably play in the river.



Figure 3.5. Pre-test 3.

R: Well, I draw a lot and um, I think it remind me kinda of Canada.

I: Okay, have you been to Canada?

R: No, but I've seen pictures and it has a lot of mountains. It's very sunny and it has a lot of rivers and squirrels I think.

I: Is this a place that you want to go someday?

R: Yeah, I've always dreamed of going to Canada.

I: Okay, Why are you so interested in Canada?

R: My uncle, he's been to Canada once before, and, uh, he said that it was beautiful. That one day he might take me up there! That's when I got really interested!!

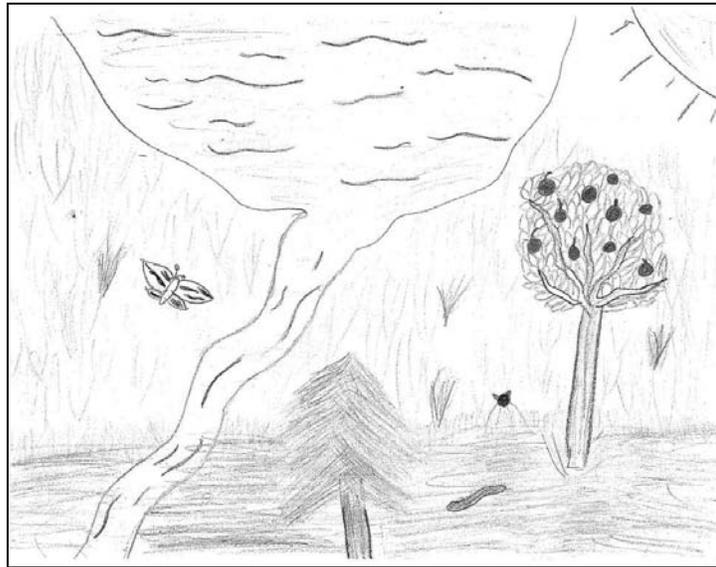


Figure 3.6. Post-test 3.

R: Well, it's about nature.

I: Okay, is this a real place or an imagined place.

R: It's at Camp Olympia (OEC) Like, where we had our cabin there was this lake right next to us and I drew a picture of the lake and some things I got to see.

I: Like what?

R: A daddy longlegs! A monarch butterfly, and, uh a pond leadin into, uh, I mean a river leading into a pond! The snake that was in the reptile room and stuff. And the trees, uh, the different kinds of trees, like pine.

I: Okay, what else?

R: I got to pick the daddy long legs and it tickles! I got to ride a horse and go canoeing and I went hiking in the woods and....(more here about the experiences)

R: Uh, I'm gonna go back when I get old and live, uh, teach the other kids how to be connected to it. (nature).

As observed in the first two students' drawings, minimal differences exist from pre-test to post-test. They were both of imagined nature, although one was much more detailed than the other, the ratings did not change from the pre-test to post-test. Often students imagined drawings included made-up descriptions with comments such as; the

cold weather is coming, the wind is blowing, or I am swimming in the river. One student drew what she dreamed Canada to be like based on conversations with an uncle. In the students post-test drawing the HISD-OEC was depicted. The drawing was detailed and specific in the naming of natural elements within the environment. In addition, the student narrated experiences with excitement and expressed a desire to go back and teach at the OEC.

Discussion

The purpose of this quasi-experimental study was to investigate the impact of the HISD-OEC program on students' definitions and perceptions of nature. Multiple methods of data collection were utilized and further insight into students' nature perceptions was gained. Results are discussed.

Perceptions of Nature – Quantitative Results

Quantitative results indicated that although increases in program group scores were apparent for several of the scales, significant changes scores were not evident in the survey findings. It is interesting to note, change scores were not significant when compared to the post-test interviews and drawing responses seemingly suggesting impact. A possible reason for the small increases in pre-test and post-test scores is the unchanged urban environment. For example, the method of questioning, such as I often feel like I am separate from nature, may still yield high scores on the post-test responses even though students had a direct experience with nature through the OEC. To further explain, Houston, where these children live and play is still an urban environment with limited access to nature. Thus, students may continue to feel separated from nature, in a

practical sense, even though their time at the OEC was significant. This idea would ring true across multiple variables surveyed (i.e. In my free time I would rather play inside than outside, I feel as though I am a part of nature, I feel disconnected from nature, etc.). Interestingly, those scales that would not seem to be affected by this phenomenon are those that are most significant. For example, environmental ethic posing questions such as, my family and I often recycle our trash, would likely be impacted by the OEC experience and yet, not affected by the fact that Houston is not as natural a setting. This would also be true for questions surrounding nature affinity since they focused on desire (i.e. I wish that I could spend more time in nature) and knowledge scores. Thus, adapting the scale to control for this factor would provide further insight.

Overall, data suggested an increased understanding and connection to nature for students attending the OEC. Findings build upon and offer further insights into previous empirical and theoretical work (Hattie, et al., 1997; Neill, 2008; Martin, 2004) that notes the power of the natural setting in the area of outdoor education. Partial support for the study's hypothesis was provided by the quantitative findings. Although increases were not statistically significant, program group post-test scores were, increasingly positively.

Perceptions of Nature- Qualitative Results Pre-test Only

A primary benefit associated with qualitative research is that the researcher captures data that is in the child's own words. Synthesis of the analysis of qualitative interviews and student drawings of their perceptions of nature aligned into two groupings on the *pre-test* data collection- (a) nature connection and (b) nature deficit. Students with a strong connection to nature drew a real place and described an actual

direct nature experience. Often descriptions included detailed memories recounting family and friend involvement and the actions occurring throughout the encounter. Interview responses about behaviors showed a high preference for the out-of-doors and described activities participated in outdoors after school. For example, “I race home and go exploring in my backyard, uh, I got a turtle back there and he eats rabbit food.” Attitudes included an excitement to learn more and a fascination with nature along with references to the importance and need to protect nature. Feelings related to nature expressed fondness and nature was described as restorative, freeing, and provided “that feeling” which was difficult to put into words... “a magical moment.” Definitions and knowledge of nature were diverse with numerous natural elements reported and representation of the natural setting was persevered. Unique definitions were insightful and associated with someone with a high affinity for nature.

Conversely, students with a suggested deficit responded to interview questions with more generic responses related to nature. In their drawings, students presented an imaginary idea of nature and descriptions reported little or no experience with nature. In addition, responses about behaviors suggest that, although the children might choose the outdoors in free time, they spent numerous hours indoors. For instance, “I don’t really go outside much so, um I am not around that much nature, but, like, I know that it does good stuff for you.” Attitudes related to nature seemed to express what they had been taught was the “right thing” to say. For example, “nature makes you healthy” or it is “important to protect nature;” often students were unsure of how these statements were connected to nature. In other words, they knew textbook responses but had little or no

frame of reference. Feelings reported towards nature were fear of the unknown or anxiety over a lack of comfort and convenience. Knowledge of nature was high, though regularly misguided in the placement of animals, objects or elements associated with nature (i.e. nature is outside- anything outside and nature is not inside).

Interpretation

In his 2002 book, *Children and Nature*, Kellert proposes a framework linking direct, indirect, and vicarious nature experiences to cognitive, affective and evaluative modes of learning. These three kinds of experiences in nature are distinguished by their developmental impacts upon children. Direct experiences are considered to involve contact with natural settings outside and independent of the human built environment. In other words, a direct experience would involve unobstructed access to play within the natural world. Findings from the current study suggest that children who had a strong connection to nature were those who had exposure to direct nature experiences. Noted through their drawings, interviews, and survey responses, these students describe a fascination and excitement towards nature along with meaningful connections to natural places. According to research by Sebba (1991), affinity towards nature developed through direct experience has a lasting effect. For example, when asked to name the most significant place from childhood, adults consistently named a special outdoor place. Sebba suggests that the preference for nature seems to be influenced by the availability of natural areas throughout childhood, rather than direct access (Sebba, 1991).

Conversely, students with a suggested nature deficit indicate little or no direct experience with nature and often “imagined” nature through vicarious exposure was discussed. Vicarious, or what Kellert (2002) also calls symbolic experience, occurs in the absence of actual physical contact with nature. Instead, what the child encounters are representations of nature that can be realistic, metaphorical, symbolic or stylized characterizations viewed from TV, movies, computers, magazines, or books (Kahn & Kellert, 2002). The disconnect of vicarious nature exposures concerns many within the research field (Kahn & Kellert, 2002; Nabhan & Trimble, 1994; Pyle, 2003) due to “erosion of direct and spontaneous contact with relatively undisturbed nature, especially among urban and suburban children, for the corresponding substitution of more artificial and symbolic encounters” (Kellert, 2002, p. 120). The results of the current study seemingly validate this concern. Students expressing a deficit possessed cognitive knowledge about nature but no frame of reference with which to connect that knowledge to actual experience. Thus, there is a gap between what they know or see vicariously and what they feel or appreciate. This conclusion is consistent with other studies that have found direct experiences produce affective based attitudes that are more likely to lead to behavior than cognitive based attitudes that are developed as a result of indirect or vicarious experience with nature (Fazio & Zanna, 1981; Millar & Millar, 1996).

In conclusion, students placed meaning to the term nature regardless of exposure. Nature perception followed two lines of response, an affective meaningful response and one that was more generic. The findings from this study indicate that the formulating condition for their response was whether students had direct experiences in nature

(nature connection) or vicarious experiences (nature deficit). What is particularly relevant is that direct exposure to nature, even when sporadic, was found to overcome the built urban environment as a method for re-connection. In other words, the urban setting may prove less of a constraint to nature connection than originally supposed as long as opportunities for direct nature experiences exist. For the population of interest, direct access to nature is often limited. Therefore, students are at a higher risk of nature deficit. Thus, programs such as the HISD-OEC, that provide direct experience, may be one method of establishing a connection.

Post-test Only

The OEC program provides urban inner city minority students with a direct nature experience. For many students attending the OEC program, this is their first reported direct exposure to nature (e.g. “I know what it (nature) is now and I know what it does, uh, like how it makes you feel like all the stuff they been saying.” While the survey data analyses did not indicate significant differences, the slight increases across all categories of knowledge, feelings, attitudes, and behaviors are promising and call for further research and utilization of better measures. Yet, qualitative findings indicate considerable influence from pre-test to post-test findings for the program group as compared to the control group. Drawings changed from imagined to real and went up on ratings of naturalness, with many of the program participants drawing the OEC landscape on post-test drawings. Interview responses were often lengthy descriptions of their time at the OEC and their experiences while at camp. For example, one student reported during the pre-OEC data collection: “I feel that nature is, it helps you and it’s

important and stuff like that. Uh, I think I like it.” The same student offered the following description after the OEC experience: “Well, I feel when I’m in nature I feel, like, I feel full.” Findings from this study suggest that students’ perceptions and connection to nature were positively impacted by the program. In addition, the same student stated, “I think our prez, uh, principal should make it a law that we gots to go to camp (OEC) cause there ain’t nothing like that were we live, or like it’s not all together, there is not much of it so it don’t be impactin us as much.”

A unique aspect provided by the OEC that varies from other outdoor experiences such as camps, adventure experiences, and vacations is the academic learning environment. Students study the history of 19th century homesteads, farming and garden cycles, geology formations, they do a water quality study on the lake, and take part in prey and predator experiments, etc. In addition, after the program students reported seeing Turkey Vultures, Monarch Butterflies, American Coots, Great Egrets, Herring Gulls, fossils from goats, deer and so on; many adults today could not name these species. As some researchers have alluded, if we don’t get children back outside and teach them about the land, one day we will look up and no one will know what bird is in the sky, or what bush provides the berries from which you can eat (Neill, 2008).

Future Research

Future research might employ Kellert’s framework that differentiates direct, indirect and vicarious experiences into the methodological procedures of the study. Asking questions about student’s exposure to nature within the context of each construct would add further credence in the findings of this study. In the current study indirect

experience was not recorded. Indirect experiences involve physical contact with nature in managed, contrived or restricted contexts such as a zoo, aquarium, or museum. It would be of interest to observe how students who have predominantly indirect exposure to nature would fall along the deficit-connection continuum. Would a combination of indirect and vicarious experiences decrease nature deficit? Is one direct experience lasting in effect or are multiple direct experiences needed? In an urban environment what would constitute a direct experience for a child? In addition, future research might examine the differences in students imagined versus real nature as observed in student's drawing. Could imagined nature have similar benefits to that of vicarious or indirect nature? Does imagined nature buffer any of the by-products of nature disconnect?

There is also further need for research on other means for increasing positive nature perceptions in both rural and urban environments, and on whether effects of program participation last. Longitudinal studies of nature perceptions comparing students who attend experiences like the OEC in 5th grade on up through adulthood would provide valuable insight.

Limitations

This study had several limitations. Although a quasi-experimental design was employed to improve the external validity of the findings, the lack of randomization makes generalizability of the study's findings unclear. However, efforts were made to insure random selection of schools and interviewed participants within the selected schools. However, this created a problem due to the selection of Oak Forest as a control school. Oak Forest students were half traditional students and half Vanguard (gifted &

talented). Thus, Vanguard students were not representative of the general HISD student population. Additional limitations include the survey developed to test perceptions and connections of nature. Although the authors attempted to implement established surveys, no age appropriate surveys were identified that tested nature perceptions.

The use of self-report data also leads to a variety of potential limitations, such as response bias, especially when working with children. To address this concern, efforts were made to clearly communicate to the students that they were not going to be graded on responses and that the researchers desired truthful responses that would be kept confidential. In addition, group think possibly occurred on survey responses due to the cafeteria/gymnasium setting in which much of the data collection occurred. The researcher made an effort to communicate with all students that their personal thoughts about nature were the desired responses.

Conclusions and Implications

This quasi-experimental study has several strengths. One was the access HISD provided and the sizeable amount of data that resulted. A second strength was the distinct focus upon impacts of outdoor programs on nature perceptions. Perhaps foremost among the strengths is the variety of methods throughout the study. Student drawings, descriptions, interviews, and surveys provided invaluable insight. Syntheses of findings indicated that OEC increased students' positive perceptions of nature through direct experience. Students increased their scores on survey measures and changes in interview responses illustrated new meaning and affection for nature. In addition, student drawings detailed fascinating post-test depictions of the OEC. However when viewed

independently, the quantitative analyses reveal the only outcome variable on which the participants significantly differed from the comparisons were on environmental ethic. Nature affinity and knowledge of nature were approaching significance. Interview descriptions and drawings were indicative of an increased positive perception of nature. Yet, some students still drew imagined nature and expressed only minimal desires to be outside more. The variance in responses suggested that direct experiences in nature offered exposure and in many cases encouraged significant positive nature perceptions. However, in some cases, only slight changes were apparent. This leads to questions such as did students with the most significant change scores have multiple direct experiences in nature? In addition, for those showing minimal change, was this their first direct nature experience?

Nonetheless, an important point for researchers and practitioners to consider is that outdoor programs in public school settings provide direct experience with nature, as indicated by this study, in many cases the 1st direct nature experience. The OEC program provided an opportunity which otherwise might not be available to inner city children. City kids in cramped schools and neighborhoods, especially those in slums and barrios, are not often, if ever offered the chance to go into the wilderness (Frost, 2006). Even if they were, many would be afraid and uncomfortable if left out alone (Bixler & Carlisle, 1994; Bixler & Floyd, 1997). The OEC provided a familiar school situation, yet the backdrop was full of natural life and offered invaluable exposure.

The study adds to the literature concerning how the urban students view and understand nature. As reported above, direct experience was suggested to be a stronger

factor related to connection/disconnection to nature than the urban setting itself. For those students who did seem to face a disconnection: Findings from this study suggest that the outdoor education experience did serve as a method of re-connection through direct exposure. The results of this study suggest that programs such as the HISD-OEC can serve as intervention strategies to connect children to nature and also provide a unique academic experience.

CHAPTER IV
OUTDOOR PROGRAMMING AND THE LITERATURE:
A CASE STUDY APPROACH

Introduction and Review of Literature

The outdoor experiential literature is clear, in its call to move beyond outcome centered studies of “does the program work,” to processes-based models of “how or why the program works” (Bocarro & Richards, 1998; Ewert & Sibthorp, 2009; Hattie, Marsh, Neill, & Richards, 1997; McKenzie, 2000; Paisley et al., 2008). As Warner (1984) indicated, “It is paradoxical that an educational movement which places so much emphasis on learning as a process focuses its research efforts on documenting products. It is both of practical and theoretical interest to begin to explore which components of the program produces particularly valuable learning experiences” (p. 41). For example, considerable literature suggests that outdoor, experiential programs offer substantial positive development outcomes (Barret & Greenway, 1995; Hattie, et al., 1997; Neill, 2008; Walsh & Golins, 1976). However, the pre-occupation in the outdoor experiential program literature with outcome-based studies has resulted in a rather large “black box epidemic” (Neill, 2008). In other words, we know more about the results being generated through outdoor experiential programs than we know about what factors lead to results, or how to replicate the impacts.

Therefore, processes related research examining program inputs and outputs and their relationship to outcomes must be further evaluated. Experiential programs rely

upon quality offerings and despite the demand for evidence-based models of outdoor programming, few are found within the literature. Neill and Richards (1998) advocate for, “increasing recognition that better outcomes will come from better processes and that therefore understanding processes is the primary route to gaining better outcomes” (p. 6).

Five meta-analysis reviews of the impacts of outdoor related programs have been conducted between 1994 and 2002 (Bunting & Donley, 2002; Cason & Gills, 1994; Hans, 2000; Hattie et al., 1997; Marsh, 1999). Review of effect sizes across the five meta-analyses indicate that outdoor education programs have a moderate impact on participants with 65% of participants stating they were better off for having participated in outdoor programs (Hattie, et al., 1997; Neill, 2008). Positive impacts derived from participation in outdoor programs are suggested in the areas such as leadership, self-concept, academics, self-esteem, interpersonal skills, confidence, self efficacy, and environmental awareness. However, in spite of the suggested benefits, reviews also point to variability in outcomes across studies, programs, and individuals (Neill, 2008). Since studies reviewed in the meta-analyses did not include information about program processes it is difficult to discern the association between processes and outcomes (McKenzie, 2000). In other words, the lack of programmatic information limits the ability to link differences in outcomes to differences in processes. Researchers have hypothesized possible influencing factors, but studies are only now being conducted that link processes to outcomes. Process variables include: program length, participant demographics, nature of the program (e.g., wilderness, camp, adventure, and education);

program instruction, and the quality of the study (Bunting & Donley, 2002; Cason & Gillis, 1994; Hattie, et al., 1997, Neill, 2008).

Two studies of significance have attempted to move beyond “black box” programming (McKenzie, 2000; 2003; Paisley et al., 2008). These studies provide the foundational structure upon which the current study was developed. The purpose of this study was to provide an in-depth review of a successful 30+ year outdoor education program and to use these two guiding frameworks to develop a clearer understanding of the relationship between program processes to program outcomes.

First, McKenzie (2000) provided six program characteristics that contribute to program outcomes: the physical environment; activities; processing; the group, instructors; and the participant. In addition to providing support for each program characteristic, McKenzie’s (2003) integrated these characteristics into an alternative model of Walsh and Golins’ (1976) “Outward Bound Process Model.” McKenzie’s research with Outward Bound Western Canada (OBWC), found 29 course components that impacted outcomes, including five of the six program characteristics suggested above, including the physical environment; course activities; the group; the instructors; and the student’s characteristics. These findings helped to clarify the means by which programs were producing outcomes.

Second, in an effort to move from “describing the product to understanding the process” (Klint, 1999, p. 164), Paisley et al. (2008) targeted six National Outdoor Leadership School (NOLS) objectives and identified student reported mechanisms through which learning related to these objectives occurred. Results suggested five broad

mechanisms: structure-oriented mechanisms –built into course design (e.g., leader of the day responsibilities, independent student group travel); instructor-oriented mechanisms – techniques implemented by the instructor (e.g., formal class, technical training/coaching); student oriented mechanisms – autonomous student acts (e.g., discovery, skill rehearsal, group interaction); student and instructor-oriented mechanisms – actions of both parties (e.g., role modeling, feedback); and qualities of the environment – interaction with natural and social environment (e.g. hiking in the woods, weather conditions). The study findings suggested a distinction between ways that students learn technical skills (instructor-oriented and student oriented) and interpersonal skills (interaction with the environment, student/instructor-oriented, structure-oriented). Thus, findings extended the literature suggesting that integration of multiple learning theories and mechanisms co-exist to provide optimal outcomes.

Although both of the above studies contribute greatly to the literature, much is still unknown about how outdoor programs achieve outcomes. What is it about the physical environment or the activities that are offered that lead to outcomes? How can programs intentionally plan groups or train instructors to aid in producing specific outcomes? How do urban students in an outdoor program operated by a public school system differ in reported processes and outcomes versus programs such as NOLS, OB? The current study was designed to provide further insight into to these programming and processes related inquires.

Therefore, this study was designed to extend the current literature by identifying the mechanisms through which students reported program outcomes and subsequently

relate them to program processes at the Houston Independent School District's Outdoor Education Center (HISD-OEC) four day, three night program for fifth grade students.

Methods

The Setting

The HISD-OEC was chosen as the research site for the study. HISD is the largest metropolitan public school system in Texas and the seventh-largest in the United States. The district serves a diverse student population, which is 58 percent Hispanic, 30 percent African-American, 9 percent White, and 3 percent Asian/Pacific Islander. Approximately 78 percent of HISD's students participate in free or reduced-price meal programs (www.HISD.org). The HISD-OEC was started in 1976 as a part of the Magnet School Program. At the time of the study, the OEC was in its 32nd year and had served over 150,000 HISD fifth grade students since its inception. Currently over 5,000 fifth graders participate in a 4 day, 3 night residential program that utilizes curricula that align with HISD's core curriculum essential elements.

The OEC facility is located 100 miles north of Houston in Trinity, TX, on 1800+ acres in what is known as "East Texas Big Thicket Country." The land is thick with vegetation and wildlife. Facilities at this site include a dining hall, open air gymnasium, auditorium, indoor and outdoor classrooms, reptile room, library, nurse's station, administrative offices, 22 heated/air conditioned cabins, swimming pool, low and high ropes courses, playing fields, and nature trails. Adjacent to the facility is a PGA golf course utilized for instructing students through the First Tee golf program.

The OEC program acts as an extension of the student's regular classroom by offering a hands-on, inquiry-based curriculum designed to teach children appreciation, awareness, expression, knowledge and skills related to the outdoors. The mission, philosophy, and program objectives of the OEC are paraphrased as follows:

Mission: The OEC will provide a unique educational experience for HISD students that emphasize the use of our natural setting in all aspects of our program. The program will utilize these natural assets to undertake multidisciplinary activities that guide the students through discovery and exploration stimulating an appreciation and understanding of the interdependence of: One person to another; One culture to another; People with nature; Things within nature.

Philosophy: Being part of a public school system, the program sets high standards for education experiences offered to our students, meeting both the state and school district's curriculum requirements. The Outdoor Education Center highly values the experiential, hands-on learning activities that immerse the students in this unique environment that is so different from the urban, inner city setting of Houston.

The OEC program has seven objectives:

- 1) Help students develop an understanding of basic environmental concepts and concerns as well as foster an appreciation of nature.
- 2) Help students understand and appreciate the interdependency of: One person to another; one culture to another; people with nature; and things with nature.

- 3) Extend the traditional classroom by reinforcing and complimenting the efforts of classroom teachers; an interdisciplinary approach.
- 4) Promote positive multicultural interactions through well supervised, integrated living/teaching groups.
- 5) Focus on the need for cooperative efforts and the value of diversity.
- 6) Promote and give direction for the worthy use of leisure time.
- 7) Promote positive self-worth and responsibility for others in all students.

Research Design

A case-study approach was used in this study to provide “thick description” of the OEC program and students’ experiences (Denzin, 2000). According to Merriam (1998) the case study approach is fitting “when description and explanation (rather than prediction based on cause and effect) are sought” (p. 7). Case studies are valued for their ability to produce rich descriptions of lived experiences, and extensive multifaceted detail allowing for transferability of in-depth information to other settings (Denzin, 2000; Lincoln & Guba, 1985).

Data Collection

Program observations semi-structured, open-ended interviews were conducted to explore the means through which HISD-OEC outcomes were achieved. Observations and interviews were carried out during a November 2008 camp session for fifth grade students (n=318) from three HISD elementary schools. This week was selected by the OEC and the researchers for convenience of schedule. During the study week the lead researcher was a participant observer. Interviews were conducted on the final day of

camp with 50 randomly selected program attendees (25 girls, 25 boys). The interviews allowed the researchers to capture the meanings and the impacts of the experience in the participants' own words (Marshall & Rossman, 2006). Students were asked about the activities in which they participated; what they learned through the activities; program operations; and positives and negatives related to their participation in the program. When students reported outcomes they were subsequently asked about "why or how" they thought the program helped achieve those outcomes. Interviews were digitally audio-recorded and transcribed.

Data Analysis

Atlas.ti.5.2 Scientific Software 2007, was utilized to organize, code, and generate themes utilizing the constant comparative method (Lincoln & Guba, 1985). Open coding and re-coding was completed independently by two researchers. Further, peer debriefing and comparisons and contrasts between interview responses were utilized to maximize trustworthiness (Strauss & Corbin, 1998). After themes were generated they were compared to the frameworks suggested by McKenzie (2000, 2003) and Paisley et al. (2008).

Results

The purpose of this study was to identify outcomes and program processes reported by students who participated in the HISD-OEC program and subsequently expand and extend the work of McKenzie and Paisley. In addition, a specific aim throughout the case-study approach was to provide in-depth documentation of HISD-OEC program implementation. Thus, results are first presented from researcher observations of nine HISD-OEC program implementation strategies. These findings from researcher observations of HISD-OEC processes are reflective of positive programming and positive youth development literature:

- *Basic needs for shelter, food, clothing, health care, physical and emotional safety were met.* Students at the OEC were the highest priority and received a superlative standard of care. The OEC provided three balanced meals and numerous snacks and water throughout the day. The cabins were heated and air-conditioned with bunk beds and night lights. A cabin counselor slept in each cabin. A registered nurse was on staff. Physical and emotional safety were continually addressed and staff was at a 1 to 10 ratio or less. Efforts were made to deal with common phobias. For example, students were provided head lamps and flashlights at night; students were provided tall rubber boots during water studies; students were given gloves, hats or extra coats during colder months, etc. In addition, there was a child developmental specialist on call at all times.

- *Value and connection to others with an emphasis on a caring adult relationship.* Students were placed into instructional mixed gender groups (IG) with students from schools other than their own and a group leader. In addition, single gender cabin groups (CG) were formed with a mix of students from their own and other schools as well as a cabin leader. This is a valuable approach since students mix with other students from varying cultures and ethnic backgrounds. In addition, they experienced connection with two or three different caring adults often of their same gender or ethnic demographic.
- *Novel experiences.* Activities were offered that built competencies and confidence. Students that came to the OEC often had little outdoor/nature experience. Therefore, competency was developed in tasks such as freedom in walking in the woods with supervision a comfortable but freeing distance away. Students were encouraged to teach and learn from one another. They were given opportunities to state their opinions, lead activities, and show the group what they discovered.
- *Opportunities for service, leadership, and responsibility.* The OEC was purposeful in every aspect of programming. Students were given the opportunity to take responsibility, leadership, and care or serving roles for their group. For example, everyone in the cafeteria has a job. For example, at lunch each student was responsible for something, e.g., passing out utensils, filling water cups, wiping down the tables. What was unique about this system was that only that person could do that job. If they did not pass you a fork you did not get to eat

with a fork. You could ask them to pass you a fork but that person had to take responsibility for your fork.

- *Comprehensive and developmentally appropriate education strategies and use of peer educators.* The OEC program followed the fifth grade designated essential skills for science and other subjects. In addition, because the program has been in existence for numerous years, staff were aware of the economic, neighborhood and other constraints many HISD students must overcome. Educational objectives were placed into real world contexts. Leaders listened to students' and to the best of their ability made every effort to increase the students' and their own understanding of previous issues that might be driving students' reactions in particular settings.
- *Supports.* Students often come to the OEC with limited experiences. At the OEC students were made aware of future careers and networks that paralleled the program. Jobs as scientists, teachers, park managers, forestry, farmers, etc. were highlighted. Houston area museums, parks, and youth programs were introduced to students with the goal of students making a long-term connection.
- *Community, family, school, peer group focus.* The OEC focused on interdependence. Students were exposed to the idea that they were important and everything around them is important not only to them but to others, e.g., each animal lives to feed another, each bug sustains the quality of the lake water, all vegetation helps us to breath and to function, etc.

- *Integration.* The curriculum moved across subject matter with students learning earth science, math, history, astronomy, writing skills, etc. The OEC was proactive in integrating technological resources to inform principals, parents, and teachers about the program. Videos, websites, and interactive presentations were made at the participating schools in an effort to gain involvement in the program.
- *Evaluation/Team Teach/ Mentor.* Teacher's performance was monitored. Teachers were filmed teaching, evaluated by senior teachers, sent to workshops and participated in weekly reviews, etc. In addition, the OEC welcomed and has initiated evaluations from outside sources.

The above elements provide the researchers' perspective on the structure of the OEC program. With this information as context, results are presented based upon the guiding frameworks of McKenzie (characteristics numbered 1-6) and Paisley's et al. (domains lettered A-E). Table 4.1 provides information pertaining to each framework, related study findings, and associated student reported outcomes.

TABLE 4.1

Student Reported Findings of Program Processes That Impact Outcomes as Related to the Literature

Guiding Framework	Findings from this Study	Student Reported Outcomes
1. Physical Environment (B,C&E)	<ol style="list-style-type: none"> 1. Nature/Wilderness Component (E) 2. New/Novel Environment (E) 3. Change of Perception concerning Environment (E) 4. Develop concern for nature/earth (B&E) 5. Mastery of Elements (i.e. weather, terrain) (C) 	<ol style="list-style-type: none"> 1. Nature Connection 2. Knowledge of and Concern for Environment 3. Mastery of Setting - Self-Confidence 4. Lack of Fear
2. Activities (A,B&C)	<ol style="list-style-type: none"> 1. Experiential (A) 2. Novel Experiences - exploration, discovery (A) 3. Opportunity to Experience Competence (A&B) 4. Gain Knowledge/Skill- technical (B) 5. Social Skill - cooperation, teamwork (A&C) 6. Unstructured Time (A) 	<ol style="list-style-type: none"> 1. Interest in school - learning by doing 2. Competence 3. Gain Knowledge/Skill-technical 4. Self-esteem, Self-confidence
3. Processing (A&D)	<ol style="list-style-type: none"> 1. Reflection (A) 2. Feedback (D) 3. Journaling (D) 4. Games/Puzzles for Retention (A) 	<ol style="list-style-type: none"> 1. Retain Information 2. Affirmation
4. The Group (A&C)	<ol style="list-style-type: none"> 1. Relatedness (C) 2. Group Dynamic - conflict/resolution (A) 3. Identity Development (C) 	<ol style="list-style-type: none"> 1. Relatedness 2. Develop Social Skills 3. Identity Development
5. The Instructors (A&D)	<ol style="list-style-type: none"> 1. Mentor/Role Model (D) 2. High Expectations and Opportunity to Experience Autonomy (A&D) 3. Supportive, Caring Adult (D) 	<ol style="list-style-type: none"> 1. New Aspirations (i.e. future job) 2. Autonomy
6. The Participant (A&C)	<ol style="list-style-type: none"> 1. Demographics - urban, minority, low SES (C) 2. Perceived Gain-TAKS testing, School (A&C) 3. Behavior change (A&C) 4. Intrinsic motivation - desire to learn (C) 	<ol style="list-style-type: none"> 1. Exposure/Opportunity - Change Outlook 2. Confidence in school and TAKS 3. Less problem behaviors 4. Self-motivated learning/discovery

(1-6) = McKenzie (2000, 2003) six program characteristics; (A-E) = Paisley et al., (2008) five domains of learning; A -structure oriented, B -instructor oriented, C-student-oriented, D -student and instructor oriented, E -environment-oriented.

During the interview phase of the study, students were asked question about the OEC in which they reported outcomes related to their experience. Once an outcome was mentioned the researcher's follow-up questions was "how do you think the program helped you with (blank)." Student reported processes that led to outcomes were then related to the literature. McKenzie's (2000; 2003) six program characteristics were supported and expanded by student responses. For example, the physical environment was a factor students consistently commented upon. However, students' responses expanded the literature by reporting specific elements of the physical environment that led to program outcomes (e.g. nature/wilderness component; new/novel environment). In addition, the work of Paisley et al., (2008) was also extended as students utilized the different domains of learning. The researcher utilized the authors defining clarification for each domain to classify the student responses into one of the five domains.

Results are further discussed through comparing and contrasting the results to the guiding frameworks in the discussion section. Prior to that each finding from this study is further discussed and observed in table form accompanied by description and representative quotation.

TABLE 4.2
Findings Related to the Physical Environment

Physical Environment- 5 sub-themes	Description	Representative Quote
Nature/Wilderness Experience	Students consistently commented on how being in nature effected them. This finding furthers literature suggesting that experiences in nature encourage mastery, self-concept, self-awareness and self-responsibility, provide "rules" in the form of natural consequences, and facilitate personal restoration (Bacon, 1983; Kahn & Kellert, 2000; Kaplan & Kaplan 1989; Kimball & Bacon, 1993; Nadler, 1993; Hattie et al., 1997; Walsh & Golins, 1976)	I love it out here. It makes me want to go outside even more. Mm, I always liked nature, but I didn't know all these fascinating stuff about it. Um, I feel more attached to nature. Actually getting to be in it, having to live in it. Having experiences in it like, uh, the canoeing, the fishing, the uh...Oh yeah, like the creek, with the little net. Just being in it you just feel different, like a part of somethin that is real.
New/Novel Environment	Students discussed how the natural environment was new and different from their normal environments and about how most things around them were new experiences of exploration or adventure. This finding is consistent with other literature suggesting that an unfamiliar environment contributes to program outcomes such as freedom of discovery, experimentation, and fresh sense of identity (Kimball & Bacon, 1993; Nadler, 1993; Walsh & Golins, 1976).	Well, school we have to sit in there for a long time, no switching around. Not nature, uh, over in Houston there's not much of it. Nothing with nature. But it's more adventurous here, uh, like paying more attention cause you learn more... cause you actually get to do it, uh you get to touch it and see it and stuff...like exploring.
Change of Perception concerning Environment	Students reported a change in perception concerning nature: less fear, a desire to learn more, etc. This finding is also found by Nadler (1993) suggesting that a constructive level of anxiety and subsequently overcoming that anxiety is believed to enhance positive experiences.	Before I wasn't that much of an outside person cuz I have a Xbox at home. But now I like it outside, besides the coldness. Like Yesterday we went out into the forest. At first, I was scared cuz it was dark and then like I got used to it. Like it wasn't as scary after. Like you could hear people walking and all this stuff and like you just go into the trees and lay down and hear the peace and everything. It's relaxin like being outside in the dark instead of being in the light all the time.
Concern for Nature/Earth	Students described nature with a new understanding and concern to protect the earth from their experiences in the environment. Researchers have suggested that experiences in nature aid in future nature appreciation and pro-environmental concerns (Chawla, 2002; Hinds & Sparks 2008; Horwitz, 1996; Kahn & Kellert, 2002).	Uh, Back in Houston I just see them and I don't care about them, but here now I know what they are, like all the creatures and stuff. It shows me like not to kill animals cept for food cuz it, um, cuz the ones like you pester, like spiders, they're important part of nature and that, uh, I should get my parents out and go do some more, um, more nature stuff. <i>You think they will want to?</i> I don't think my mom or my dad would, but I will probably make'em (laughs).
Mastery of Elements	Students reported pride at overcoming elements. For example, expressed excitement at being able to walk through the woods to their cabin at night without their headlamp. Research suggests that overcoming elements such as weather, temperature, and the physical environment contribute to self-confidence (Hinds & Sparks, 2008; Neill, 2008).	Like, at first I was worried I would get lost and stuff but they showed us how to find or make marks in the woods so that you could find your way back and um, after a while I always knew where I was.

Physical Environment

Both guiding frameworks suggest that the physical environment in which outdoor programs occur impacts outcomes (Table 4.2). However, more information is needed regarding how the physical environment impacts outcomes. Using interview data, this study extended the extant literature by suggesting five elements of the environment that students reported to impact outcomes: (a) nature/wilderness component; (b) new/novel environment; (c) change of perception of the environment; (d) development of concern for the natural environment; and (e) mastery of natural elements (e.g., weather, terrain). Students consistently stated that being in nature influenced overall program outcomes. For these urban dwellers the natural environment was new and challenging. Students discussed overcoming feelings of fear and discomfort and further described nature appreciation through personal restoration, freedom and discovery, and a new sense of concern/care for nature. These findings are supported in the literature that suggests that experiences in nature encourage mastery, self-responsibility, self-awareness, and facilitate personal restoration and affinity towards nature (Chawla, 2002; Kahn & Kellert, 2002; Kaplan & Kaplan 1989; Hattie et al., 1997).

TABLE 4.3
Findings Related to Activities

Activities 6 sub-themes	Description	Representative Quote
Experiential Learning	Students reported time and time again that they enjoyed learning by doing, learning through experience, and utilization of all senses. The literature base is full of research advocating that students learn holistically through the combination of mental, physical, and emotional stimulation (Dewey, 1966; Gass, 1995; Walsh & Golins, 1976; Wolfe, 2001).	Because you are getting to do it. Like, um, being able to do the actions and that's what's so fun about it. I like it when I learn here. Um, like, at school they just tell you about it and you write it in your notebook, but here you experience doing all of it instead of just listening or reading it out of a book. Like your working with the real live thing! And in school we have to just listen to it every time, every time you just gotta sit there.
Novel Experiences - Exploration, Adventure, Discovery	Students expressed that activities were new and exciting and that learning included exploration, adventure, and discovery. Research suggests that novel and challenging activities contribute to lasting impacts when students are equipped to handle the task at hand (Csikszentmihalyi, 1990; Kimball & Bacon, 1993; Walsh & Golins, 1976; Witman, 1995).	Well, it school, but it's also different because it is fun at the same time and we get to learn lots of things and we also have to have, um we get to have fun. Normal school, like, we got to stay in class all the time, but out here we all adventurous and stuff. We get to try different things. Like at least about five things every day and stuff that we never have experienced before. We exploding (laughs) I mean exploring. Explore things like find, uh, snake skeletons and stuff.
Opportunity to Experience Competence	Students responded that they had feelings of self confidence when they mastered or learned new skills within an activity. They expressed feelings of pride along with a desire to participate in that activity again or take part in other new activities in the future. Researchers suggest that mastery of age appropriate challenging activities can promote healthy developmental growth as well as increase participant's confidence in other areas of life (Csikszentmihalyi, 1990; Dewey, 1966; Hopkins & Putnam, 1993; Schoel et al. 1988).	Being here I get to do things I've never done before and you know what...I am really good at them and I didn't even know it! At home I do things I have always done and it never changes. Here I caught 2 sunfishes and a catfish; I rode a horse; I played games; I shot Archery...all new stuff to me and I actually was pretty good at em all.
Gain Knowledge/Skill - Technical	Students reported that they like learning through the activities. They enjoyed relating new knowledge gained such as specific names of trees, how to use a compass, and names of species (Holt, 1984; Wlodkowski & Jaynes, 1990).	We learn a lot here because we get to do it and at school we don't. It's cooler stuff, like activities, like, it feels almost like recess. Like sometimes it's like they trick you, like we do math and stuff, like science and a little bit of history, like because you do both, you know and you play. Like we looked at different animals and we went to the aquatic community and we checked out the fish and once we look at the fish we put them inside little tanks and we examined their, um, adaptations and what they use to get around, like did you know they are kind of camouflaged...

TABLE 4.3 Continued

Activities 6 sub- themes	Description	Representative Quote
Social Skill - Cooperation, Teamwork	Students expressed that they learned a lot from activities in which they had to work with others, make group decisions, and interact with other people outside of their normal school friends. Schoel et al. (1988) and Witman (1995) have found that in outdoor experiences participants have achieved positive outcomes from activities in which problem solving, cooperation, team work, supporting others, communication skills, social responsibility, and personal responsibility are involved.	I've learned a lot of stuff. It was more than I thought I would learn. Like I learned lots about school stuff and nature but also met lots of new friends. Like different than my other. Um, when I am out here working on stuff with my friends I'm far away from my other friends so I don't act up or try to show out and all that stuff. Here they's telling me not to show out and not to get yourself in trouble. Cuz the other person might be doing her work and you just laughing and talking and playing and you getting D's and they getting A's.
Unstructured Time	Students commented that they enjoyed time to play, unstructured free play. The literature is full of support for the power of play in healthy childhood development (Caplan & Caplan, 1973; Elkind, 2007).	I really, really liked getting to play, like we went to the island and they just let us go explore stuff.

Activities

Both frameworks also suggest that program activities impact outcomes (Table 4.3). Students reported six factors related to program activities that extend the “how and why” of existing literature. These factors included: (a) experiential learning; (b) novel experiences - exploration, discovery, adventure; (c) competence; (d) gain knowledge/technical skill; (e) social skill-cooperation, teamwork, decision making; and (f) unstructured time. Students indicated that they enjoyed learning by doing, participating in engaging, novel, and challenging activities, and mastering new knowledge and skills within an activity. Within the literature there is abundant research advocating that students learn holistically through the combination of mental, physical, and emotional stimulation; and additionally, when students are equipped to handle challenging age-appropriate activities lasting impacts occur (Csikszentmihalyi, 1990; Dewey, 1966; Gass, 1995; Wolfe, 2001).

In addition, students reported that unstructured, but supervised time influenced outcomes. This finding is consistent with research suggesting that free-unstructured play is an important and needed facet of child development (Almy, 1966; Burdette & Whitaker, 2005). Program activities were mainly structured and instructor-oriented learning settings. The HISD-OEC programming structure was set up to foster experiential, novel experiences and instructor mediated educational activities.

TABLE 4.4
Findings Related to Processing

Processing 4 sub-themes	Description	Representative Quote
Reflection	Students expressed enjoyment at being given time to reflect or talk about their experiences within their groups. Time for reflection and processing is a model researchers suggest aids in effective outdoor experiences (Bacon, 1987; Gass 1995, Priest & Gass, 1997).	I would just go sit under a tree and write what, um, about what was around me or do the game thing where you write what all you can find with the alphabet like they showed us and then you come back and tell everyone about it.
Feedback	Students enjoyed being noticed by their instructors. Feelings of accomplishment along with a desire to learn how to do tasks were strong. Pride was expressed by students when they were specifically given feedback about an activity they participated in. Researchers note the power of positive feedback and children's self confidence (Tunstall & Gipps, 1996)	Well, uh they said that I was one of the best at archery and it was only my first time to do it. Like, if I practice I bet I could be like better.
Journaling	Students commented on writing in their journals regarding what they had experienced. Students mentioned drawing as well as writing down their thoughts throughout the day. Research suggests that writing down experiences and thoughts lead to greater influence (Hammond, 2002).	I wrote about how me and my partner we were like, you know, working together. I liked that. I drew the deers we saw come out and some of the tracks we saw.
Games/Puzzles for Retention	Students reported enjoying games, puzzles, and word search activities within their journals. These types of activities are suggested to enhance memorization and retention of knowledge more so than traditional formats (Hill, Ray, Blair, & Carver, 2003).	It helped to have the vocabulary and stuff do, like fun stuff instead of just having to write the definition you could play a game or something.

Processing

Processing was identified by the students in this study and by the guiding literature to be an important process impacting outcomes (Table 4.4). Students who participated in the OEC program commented on writing in their journals regarding what they had experienced. They expressed enjoyment in drawing, word puzzles, and writing down their thoughts about an activity. Time for reflection and feedback was a structured mechanism, built into the design of the program. It was also a student /instructor-oriented mechanism through scheduled times of one on one discussion and appraisal.

TABLE 4.5
Findings Related to the Group

The Group 3 sub-themes	Description	Representative Quote
Relatedness	A consistent theme across student responses was the opportunity to relate to others within their group. They enjoyed supporting and encouraging each other and working together in their instructional group and bonding in their cabin groups. Group cohesion is thought to contribute to program effectiveness through acceptance, open communication, and conflict resolution (Hopkins & Putnam, 1993; Walsh & Golins, 1976; Witman, 1995).	You gets to meet lots of new people and learn stuff you wouldn't have because you would not have meet them. Like at school its all the same people but here you get to be friends with all different people from you.
Group Dynamic - conflict/resolution	Group context were often mentioned by students. Thy commented on groups tasks and decision making as well as conflict/resolution in games, activities, and communal living quarters. Researchers advocate for social situations and interactions in which students are encouraged to work through problems (Salomon, Perkins, Ohlsson, 1998).	My cabin, you know, they like my brothers now. We made it through the woods and sat and looked at the stars and roasted marshmallows...Like once in a life time stuff for most of us.
Identity Development	Students discussed meeting people different from them and learning about their lives. Conrad & Hedin (1981) and Walsh & Golins (1976) found that developing personal relationships with other participants (often different from themselves) through outdoor experiences made significant contributions to their personal and social development.	You meet new people and you learn stuff not just school stuff but like about other people like my friend he was sad about missing his mamma but it was like okay because we was with him. Like Camp Olympia, it's a big thing to come out here like some of my friends didn't get to come and I am sad for them because like I am better now.

The Group

A consistent theme across student responses was the value placed on connecting with others in their group (Table 4.5). Students discussed the diversity they experienced and related learning about others' lives different from their own. Conrad and Hedin (1981) and Walsh and Golins (1976) found that developing personal relationships with other participants (often different from oneself) through outdoor experiences made significant contributions to participants' personal and social development. Group dynamics were largely a student-oriented mechanism and literature suggests that group

cohesion contributes to program effectiveness through acceptance, open communication, and conflict resolution (Hopkins & Putnam, 1993; Witman, 1995).

TABLE 4.6
Findings Related to the Instructor

The Instructors 3 sub-themes	Description	Representative Quote
Mentors/Role Model	Students looked up to their instructors as role models and mentors, some even desired to become scientist or teachers like their instructors. Research suggest that effective instructors who are positive, encouraging and maintain high expectations have the potential to influence student outcomes (Dyson, 1995; Hendy, 1975, Riggins, 1986).	I want, if the opportunity comes, I want to be a teacher here, um, if it is still here. I don't know if it will but I hope so. I want to do this because that most of the kids they don't learn this. It is important for them to come out here and learn about the animals and what they eat and learn about our plants and our trees that give us oxygen.
High Expectations and Opportunity to Experience Autonomy	Students reported pride at being given responsibilities for the group or for carrying supplies for the instructor or for choosing which path to take, etc. Instructor feedback and attainable, yet high, expectations are suggested to promote positive impact upon participants (Brackenreg, Luckner, & Pinch, 1994; Hattie et al., 1997; Riggins, 1986).	I have two jobs and everything. I'm the time manager and the restroom manager. Time manager you gotta make sure the people on time and that's the most important job out of all the jobs! And the restroom job I just make sure the people do what they're supposed to in the restroom and stuff. I like doing these things and taking care of stuff. Too bad we don't have time managers in school.
Supportive, Caring Adult	Positive comments were made by students in regards to their cabin leaders living with them and their instructional leaders who were teaching them. Research suggests that children need supportive, caring adults for healthy development (Larson, 2000).	Like it was cool that they lived with us and stuff, like knew our names and cared how we did in school. They are all really good teachers.

The Instructors

Students reported three factors that led to instructors having an impact (Table 4.6). The first was the opportunity to experience autonomy. This was a structure-oriented mechanism through which the program design fostered opportunity for responsibility and accountability. Students reported pride in being given responsibilities for the group, such as carrying supplies for the instructor, providing water for the group, or choosing which path to take in the forest. Instructor feedback and high, yet attainable, expectations through these given responsibilities are suggested to promote positive impacts upon participants (Brackenreg, Luckner, & Pinch, 1994; Hattie et al., 1997; Riggins, 1986).

The second factor was the role-modeling/mentoring aspect of instructor-student relationships and the third was supportive, caring adult interactions. Research suggests that positive, supportive role-models in outdoor experiences have the potential to influence student's self-confidence, interest in the subject, and overall positive perceptions of the program (Dyson, 1995; Hendy, 1975).

TABLE 4.7
Findings Related to the Participant

The Participant 4 sub-themes	Description	Representative Quote
Demographics - Urban, Minority, Low SES	Students expressed excitement towards the "new world" around them and commented on exceeded expectations. Research suggests that student's background, expectations, attitudes, and participation are likely to influence outcomes they experience (Estes & Ewert, 1988; Hattie et al., 1997; Hopkins, 1982; Walsh & Golins, 1976).	It's like a whole new world. I didn't really thought it would be like this, thought it was gonna be different, but in my dream I didn't really like the way my dream was, but here it's actually way better. It's nice here. I didn't really picture it like this. here in life it looks better than my dream because we have fun and I like it a lot here. We do activities we do like going to the forest and looking for bugs inside of logs or looking at the trees. This is my first time to do all this and it is really pretty. Cuz back in Houston there's not that much like this.
Perceived Gain - TAKS Testing, School	Students described that they thought they would do better on TAKS testing from participation in the program. Comments were also made that they felt that they would do better in school in general. Walsh & Golins (1976) support this notion by explaining the positive impacts of "thinking, feeling, and behaving as if there is something to be gained by participating" (p. 3).	I will just be more like a scientist cause I can actually figure stuff out now, like the strategies to figure things out. I gonna to better, especially on the science TAKS, we're all gonna do really good now and it's gonna be real good. Like one girl said, "Oh yeah, I learned it at the OEC" but the other kids at school they're gonna be like, that didn't come, they're gonna be like sad that they didn't get to come cuz all this it's gonna be on the test.
Behavior Change	Students commented on their behavior changes from perceptions of others behaviors and the expectations of instructors. Age and gender of participants are to influence outcomes related to changes of personal development and accepted behavior (Conrad & Hedin, 1981; Hattie et al., 1997; Walsh & Golins, 1976).	When I am at school I can't control my mouth and like I get in trouble a lot but here they teach me to just calm down and don't tell 'em they stupid or call 'em bad words. Don't just take it that far. Like with the time outs and everything I think it's good and I can tell the teacher what's going on and not have to take it all myself.
Intrinsic Motivation - Desire to Learn	A desire to learn and an excitement to know more was a consistent comment by the students. Again research suggests that challenging novel experiential learning promotes positive outcomes in programs (Dewey, 1966; Gass, 1995; Walsh & Golins, 1976; Wolfe, 2001).	Like I want to learn more about science now so that I could think more about it to save the planet and help people more. It like so fun to learn here like how everything decomposes like bugs that live on logs. Like now I can go read something and it makes more sense cause I seen it. Like I could collect bugs and study them.

The Participant

Findings from the participant themselves were divided into four categories (Table 4.7). The first had to do with student demographics typical of HISD students; urban, minority, low socio-economic status. Students commented on how the OEC experience exceeded their expectations and expressed gratitude for the opportunity to

attend the OEC that was provided to them. The literature supports the idea that participant's background, expectations, attitudes, and participation are influential to outcomes in outdoor related experiences (Estes & Ewert, 1988; Hattie et al., 1997; Walsh & Golins, 1976). Second, students perceived that they would improve performance at school and on the state mandated achievement tests as a result of their participation in the program. Although this outcome may be unique to an outdoor education program within the public schools, the literature supports the notion of positive impacts of "thinking, feeling, and behaving as if there is something to be gained by participation in outdoor experiences" (Walsh & Golins, 1976, p. 3).

Third, students commented on their own and others behavior changes as a result of participating in the program. Instructor expectations, perceptions of socially accepted behaviors, and a desire to participate were all factors influencing behavior. In addition, participants experienced a fresh identity of "being the good kid" brought about by an untarnished reputation created within the new setting. Finally, a self-motivated, intrinsic desire to learn was expressed by the students. This finding was consistent with literature suggesting that challenging novel experiential learning promotes self-directed interest in learning (Dewey, 1966; Gass, 1995; Wolfe, 2001).

Discussion

Interview findings confirmed much of the existing theory on the means by which outdoor program outcomes are achieved. Additionally, findings indicated that program quality was a central theme with numerous students reporting outcomes related to processes that are prominent within programming and positive youth development

literature (i.e. positive role models, opportunity to experience new things, experiential learning, supportive adult interactions, etc). Although these concepts are often imbedded within research, it is essential that researchers seek to continue to identify and validate factors that influence outcomes (Bocarro & Richards, 1998).

For example, the actions and qualities of the instructors were noted as key factors influencing outcomes. These included: (a) being positive mentor/role-models; (b) providing high-expectations and opportunities to experience autonomy; and (c) fostering supportive and caring interactions. The results from this study confirm the six assumptions of McKenzie (2000) and expand our understanding of each by offering further insights into “how” and “why” these six program characteristics contribute to student reported outcomes.

In a similar manner, findings support Paisley et al., (2008) suggestion that students learn through a variety of mechanisms. Paisley et al., (2008) provided a distinction between the way students learn “hard” (technical) and “soft” (interpersonal) skills. Findings support this distinction with instructor-oriented, structure-oriented, and environment-oriented mechanisms most apparent when learning technical skills (e.g., hard skills such as how to conduct water quality tests, and how to fish, ride a horse). For interpersonal skills (e.g., soft skills such as group dynamics, identity development, relatedness, competence) results suggest the importance of student/instructor-oriented, student-oriented, and environment-oriented learning mechanisms. Results further validated that students utilize diverse learning mechanisms for particular skills sets.

Future Research

Future research should continue to investigate the linkages between program processes and outcomes. It will be important to see if distinctive processes are more viable. For example, investigating whether the process components either change or are different in emphasis for different groups depending on gender, age or ethnicity, as well as where one lives and outdoor exposure experiences would be important. Longitudinal studies would also be useful for investigating more distal and lasting impacts of participation in outdoor programs. In all of this work, building on existing frameworks would be useful to continue to build a coherent body of knowledge linking processes and outcomes.

Conclusions

To produce research that can directly and succinctly inform practice, the field of “experiential education must move past simply documenting the value of experiential programs and, instead, develop more evidence-based models for experiential education practice” (Ewert & Sibthorp, 2009, p.376). To do so, Sibthorp (2009) suggests researchers move beyond conducting research guided primarily by personal interests and conduct research that is identified as a gap in the literature or spurred on by previous grounded research. Thus, the design for this study was based largely on existing research and examined the processes and mechanisms that underlie a quality experiential education program. Although every program differs in its mission and purpose, the HISD-OEC, as well as other outdoor programs utilize similar program concepts. Therefore, this study used existing grounded frameworks offered through previous

studies to extend theory and practice from the viewpoint of student reported findings from in-depth study of one experiential outdoor program. Consequently, what is in the “black box” continues to be better understood dissipate. Not only were both authors previous research findings extended, but new insights were added to the literature. In addition, the in-depth review of the program provided specific detail and processes information related to programming implementation. As noted by Deming, “If you can’t describe what you are doing as a process, you don’t know what you are doing” (As quoted in Sibthorp, 2009, p. 458).

CHAPTER V

CONCLUSIONS

The purpose of this study was to conduct research to (a) better understand children's perceptions of nature (b) aid in opening the "black box" related to programmatic processes and outcomes in outdoor education research. The first study used surveys, drawings and interviews to explore the assumption of a nature deficit disorder for fifth grade youth living in an urban environment. The study investigated students' definitions and perceptions of nature. Findings indicated variations in students' perceptions and suggested that direct nature experiences can play a significant role in creating a connection with nature. Students with a strong connection to nature discussed positive emotional attachments to nature due to direct nature experiences in which they had previously been involved. On the other hand, students who had little or no direct experience with nature showed little emotional connection or affinity towards nature, thus suggesting a deficit. These findings suggest that the assumption that all urban children are at risk of experiencing a nature deficit is misleading. Notably, urban children may face constraints in accessing nature. However, the results of this study suggest that urban children who overcome these constraints and gain direct access to natural settings can have strong bonds to nature.

The second study built upon the first. The study focused on the impact of an outdoor educational experience upon fifth grade children's perceptions of nature. The quasi-experimental mixed-method design provided valuable insights into outcomes

associated with students' participation in a four day, three night outdoor learning education program sponsored by an urban school district. Findings indicated that the outdoor education experience increased students' positive perceptions of nature by providing direct access to the natural environment. Students increased their scores on survey measures and changes in interview responses illustrated that students ascribed new meaning and increased affection for nature. In addition, student's post-program drawings depicted natural scenes with less manmade structures and increased natural elements. Analysis of survey data revealed significant increases in the students' environmental ethic. Changes in nature affinity and knowledge of nature approached significance. These finding may be due to the fact that although the outdoor experience in nature at the Houston Independent School Districts' Outdoor Education Center (HISD-OEC) was positive, the students still live in an urban environment with little access to natural areas. While the students may desire to spend more time in nature, opportunities are often not available to participate where they live. Future studies, could adapt the survey to control for this concern. Although some variance in students' responses occurred, the overall findings suggested that students' definitions and perceptions of nature were positively impacted by the outdoor experience. In addition, the OEC program provided direct experience with nature which led to increased connection with nature.

The final study used a case study approach to provide an in-depth review of the HISD-OEC program's purpose, mission, philosophy, and program implementation practices. The findings linked student reported outcomes to program processes. The

study was structured around the grounded theory approach of McKenzie (2000; 2003) which suggested six program characteristics of influence and the work of Paisley, Furman, Sibthorp, and Gookin (2008) which outlined five domains of outdoor learning. Findings extended and expanded the work of both authors in addition to providing new insights. Qualitative findings suggested that among other findings, participants valued the physical environment, activities, processing, group dynamics, instructors, changes in their own identity, unstructured time, engaging and occupying tasks, and the overall importance and desire to maintain the outdoor program. The HISD-OEC was a noteworthy program to research utilizing a case study approach due to its 32 years of operation as part HISD's of public school curriculum.

Future Research Agenda

There are several research questions and suggestions for future study designs resulting from the work on this dissertation project. Perhaps the most significant is the invitation from the HISD-OEC to continue partnering in future research. Amongst outdoor programs, the OEC provides unprecedented longevity within the public school system. In addition, the OEC directors have been with the program since its inception. Thus, the OEC is an optimal setting to embark on longitudinal studies looking at the impacts of the program during elementary school and on through adulthood. In addition, the setting also provides the possibility of conducting retrospective studies in which past OEC participants are contacted to explore long-term effects.

From a program sustainability perspective, students' statements that they would perform better on the state administered achievement test as a result of their OEC

participation should be further explored. Additionally, findings suggested decreases in problem behaviors, enhanced interest in school, and increases in autonomy, relatedness, and competence. These findings should also be further examined.

Further efforts should also be made to add to the body of research suggesting the existence of nature deficit in other urban contexts with results subsequently compared to those from children living in rural settings. It would also be useful to conduct future research to explore direct experience in nature as the predominant influencing factor in ameliorating a perception of nature deficit disorder.

Methodologically, the mixed-method quasi-experimental design should be employed to study other aspects of outdoor programs. The synthesis of survey findings, interviews, and drawings in Chapter III provided valuable insights that one method of data collection could not have achieved. Utilizing these methods meets the need for high quality systematic research within the field.

Final Thoughts

The findings from this study should be of value to both researchers and practitioners. The study attempted to better understand children's perceptions of nature and relate program processes to program outcomes. While no one study can account for the complex mechanisms that interact to make programs effective, the current study adds further to efforts to examine the "black box."

While, I am an outdoor enthusiast who supports outdoor programs, every attempt was made to take an ethical and dispassionate approach to the study. Thus, multiple internal and external self checks were employed throughout the research process. From

the outset of the study the lead researcher, HISD, and OEC staff discussed ethical issues related to the collection, interpretation, and dissemination of results. In addition, the HISD-OEC program leadership communicated their desire for an honest critical evaluation of programming efforts. Through a number of measures (e.g., digital audio recording of all interviews, reflexive journaling, peer reviews of emerging themes, etc.) the researcher sought to report the “voice” of the study’s participants. Although no study is free of bias, the researcher valued efforts to avoid injecting preconceptions into the research process.

In sum, I have learned more through this process of developing, implementing, analyzing, and distributing the results from this study than any other academic involvement I have undertaken to date. Truly, experiential education, or learning by doing, is a valued process.

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APPENDIX A
PERCEPTIONS AND CONNECTIONS TO NATURE SURVEY
PCN SURVEY

PERCEPTIONS AND CONNECTIONS TO NATURE SURVEY

PCN SURVEY

This survey is about your perceptions of nature. The information you give will be used to better understand how young people understand and respond to nature.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. If you are not comfortable answering a question, just leave it blank. However, we do ask that if you feel comfortable, please complete all 30 questions.

The questions that ask about you background will only be used to describe the types of students completing the survey. Your name will only be used to identify pre-post tests. Personal information about you will not be reported by name

Make sure to read every question carefully. When you are finished follow the instructions of the person giving you the survey.

Thank you very much for filling out the survey!

Sample Question:

(1) Pizza is tasty.

- a. Strongly Disagree
- b. Disagree
- c. Not sure
- d. Agree
- e. Strongly Agree

Name: _____

PCN SURVEY
Perceptions & Connections to Nature Survey

DIRECTIONS: Please make sure that you write your name on the top of the survey. Please circle your response to each question and fill in any other information requested.

1. What is your gender?
 - a. Female
 - b. Male

2. What is your race?
 - a. Black/African American
 - b. Hispanic/ Latino
 - c. Asian
 - d. White/Caucasian
 - e. Native American
 - f. Other _____

Knowledge:

3. Can you name a tree?
 - a. Yes, please write your response:

 - b. No

4. Can you name a fish?
 - a. Yes, please write your response: _____
 - b. No

5. Can you name something that you use throughout the day that comes from a tree?
 - a. Yes, please write your response: _____
 - b. No

6. Can you name a wild animal that you might find in the woods?
 - a. Yes, please write your response: _____
 - b. No

7. Can you name a reptile?
a. Yes, please write your response: _____
b. No
8. Can you name any (one) of the four parts of a habitat?
a. Yes, please write your response: _____
b. No
9. Can you name a decomposer?
a. Yes, please write your response: _____
b. No
10. Can you name what animal bacon comes from?
a. Yes, please write your response: _____
b. No
11. Can you name a cycle found in nature?
a. Yes, please write your response: _____
b. No
12. Can you name one way you can conserve water?
a. Yes, please write your response: _____
b. No

Feelings:

13. I often feel like I am separate from nature.
a. Strongly Disagree
b. Disagree
c. Not sure
d. Agree
e. Strongly Agree
14. I wish that I could spend more time in nature.
a. Strongly Disagree
b. Disagree
c. Not sure
d. Agree
e. Strongly Agree

15. I feel as though I am a part of nature.
- Strongly Disagree
 - Disagree
 - Not sure
 - Agree
 - Strongly Agree
16. I feel that it is important to take care of nature and the natural environment.
- Strongly Disagree
 - Disagree
 - Not sure
 - Agree
 - Strongly Agree
17. I feel disconnected from nature.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
18. I feel afraid or uncomfortable when I am in nature.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree

Behaviors:

19. I spend time in nature everyday.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
20. I try to find ways to spend time in nature.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree

21. After school I usually spend my time inside.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
22. My family and I often recycle our trash.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
23. I often leave the lights on in my room when I am NOT in my room.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
24. I often leave the water running in the sink while I brush my teeth.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree

Attitudes:

25. I believe that by taking care of the natural environment I can make a difference for future generations.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
26. I believe that spending time in nature is for people who are NOT like me.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree

27. In my free time I would rather play inside than outside.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
28. I believe that nature is important.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
29. I believe that it is other people's responsibility to take care of the natural environment, not my responsibility.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree
30. I believe that as I get older I will spend more time outside in nature than I do now.
- Strongly Disagree
 - Disagree
 - Not Sure
 - Agree
 - Strongly Agree

APPENDIX B
PERCEPTIONS OF NATURE
INTERVIEW GUIDE

Perceptions of Nature Interview Guide

- 1. What is nature? Can you describe it to me?**
- 2. Describe a nature experience or activity you took part in.**
 - Describe where you were- what did the area look like?
 - What did you do while _____?
 - Why did you go there? Vacation?
 - Did you enjoy the experience?
 - Who was with you?
- 3. How do you feel when you are in nature?**
 - Do you feel comfortable in nature?
 - Do you feel more afraid or excited? What made you afraid/excited?
 - Do you wish you could spend more time in nature? Why/Why not?
 - Are you comfortable playing outside by your self? Why/Why not?
- 4. What sorts of things do you like to do afterschool?**
 - Do you play in nature/outdoors during the week after school?
 - What do you usually do when you play outside?
 - Have you had any lessons/training to do this activity?
 - Where are you when you play outside?
 - What types of natural elements are there (e.g. trees)?
 - Do you play in nature/outdoors on the weekend?
 - What do you usually do?
- 5. How do you think your family feels about nature/outdoors? Why?**
 - Do they spend time in nature?
 - What do they do when they are in nature/outdoors?
 - Do you do things together in nature/outdoors as a family? Like what?
- 6. Would you choose to be inside or outside in your free time?**
 - If you could do anything you wanted, what would you choose to be doing in your free time? Would you choose to play inside or outside? Why?
 - What is your favorite thing to do when you are in nature/outdoors?
 - Have you ever climbed a tree, played in a creek, been to the beach?
 - Do you do anything to protect the natural environment? Why do you do that?
 - What else or what could you start to do to take care of the natural environment?
- 7. If you could go anywhere in the world where would you want to go?**
 - Why? What would you want to do there?

8. **Can you try to describe your relationship with to nature me?**
9. **Could you tell me about your drawing?**
 - Ask about elements within the drawing?
 - Where is this place? Have you been there? Is this a real place or an imaginary place?
 - What do you do when you are there?
 - Do you think this place exists? Close to here or far away?
 - **Post-test Only: Did any of your feelings about nature change after going to the OEC? How/Why or Why not?**

APPENDIX C
DRAWING ACTIVITY

DRAWING ACTIVITY

DIRECTIONS: Please write your name on the back of the blank piece of paper I have just given you. On the front side of the paper, please draw a picture of nature. Draw what nature looks like to you. You may use any of the colored pencils or crayons I have provided. When you are finished drawing I will ask you to describe your drawing. I may also ask you other questions regarding your drawing. Your name will not be associated with your drawing in order to match pre-post test and survey items.

APPENDIX D
HISD-OEC INTERVIEW GUIDE

**HISD-OEC Interviews
Data Interview Guide**

***All questions will have follow-up questions regarding program processes when appropriate (e.g. “How do you think the program helped you overcome that?”).**

- 1. Are you enjoying the OEC program/Camp? Why or Why not?**
- 2. What do you like best about the OEC program? Why?**
 - Why was that your favorite part of the program?
 - Did you feel comfortable here at camp?
 - What was your favorite area/spot at camp? Have you ever been to a place like this before? Explain?
 - Do you wish you could spend more time here? What would you do?
- 3. Describe an activity you took part in here at the OEC?**
 - Describe where you were- what did the area look like?
 - What did you do while _____?
 - What did you learn about?
 - Did you enjoy the experience?
 - Who was with you?
- 4. What are some of the things you learned about while here at the OEC?**
 - Did you know anything about that before the OEC program?
 - What would you like to learn more about?
 - How was the OEC learning environment different than your normal school environment? Did you like learning this way? What was good/bad about this type of learning?
 - In which environment do you feel that you are able to pay better attention? In which environment do you feel that you learn the most?
- 5. Do you feel more/less connected to nature by attending the OEC?**
 - What makes you feel more/less connected?
 - Has your attitude changed about nature by attending the OEC? How?
 - Do you want to spend more or less time in nature now?
 - What was the coolest thing you learned about nature by attending the OEC?
- 6. Did the OEC spark your interest about a particular subject matter?**
 - Is there something you would like to learn more about that you learned about here? How would you go about finding more information about that?
 - What is your favorite subject? Was that your favorite subject before coming to the OEC?
 - What is your least favorite subject? Did you learn anything new about that subject here at the OEC?

- What do you want to be when you grow up? Why do you want to do that? What sparked your interest in that?
- 7. Do you feel that this OEC experience is important for students?**
- Why is it important/not important to send students to the OEC?
 - How has the OEC impacted you?
 - What is something positive about the program?
 - What is a negative of the program?
- 8. Have you noticed differences in how you and other students behave while they are at the OEC?**
- Do you and the other students ask more/less questions while attending the OEC?
 - Do you pay attention more/less at the OEC?
 - Did you want to participate more/less in the lesson while here at the OEC?
 - Do you see other differences in the students/yourself during or after the OEC?
- 9. What will you take away with you from this OEC experience when you get home?**
- Is there anything you would like to change about your OEC experience?
 - Is there anything else you would like to say about how the OEC impacted you?
 - Is there anything else you would like to say about your OEC experience?

APPENDIX E
CONSENT FORM

PARENT PERMISSION FORM
Survey of Children's Perceptions and Connections to nature

Introduction: The purpose of this form is to provide you with information about a study a Texas A&M Student will conduct with HISD to determine children's perceptions and connections to nature. In addition, those students who attend the HISD Outdoor Education Center (OEC) will be asked about their outdoor experience.

If you give permission for your child to participate in the study they may be asked to complete a 10-15 minute survey, a short 10-15 minute interview and for some children a 10 minute drawing activity.

What will my child be asked to do?: If you allow your child to participate in this evaluation, they will be asked questions about their nature experiences and information about activities they've participated in outdoors. Your child may also be asked to draw nature. If your child attends the Outdoor Education Center they will be asked questions about their experience. If given permission by the parent and the student, interviews will be audio taped to allow us to go back later and review. Only the researcher will have access to these audiotapes.

What are the risks involved in this evaluation?: The risks associated with this evaluation are minimal, and are not greater than risks your child ordinarily encounters in daily life.

What are the possible benefits of this evaluation?: Your child will receive no direct benefit from participating in this evaluation; however, the information about children's nature perceptions and about the HISD outdoor education will be useful to the HISD administrators when they design outdoor programs for children.

Does my child have to participate? No, your child doesn't have to be in this study. You can agree to allow your child to be in the study now and change your mind later without any penalty.

What if my child does not want to participate?: In addition to your permission, your child must agree to participate. If your child does not want to participate they will not be included and there will be no penalty. If your child initially agrees to be in the study he/she can change their mind later without any penalty.

Who will know about my child's participation in this study?: Information collected during this evaluation will be kept confidential. No identifiers linking you or your child to this evaluation will be included in any sort of report that might be published. Research records will be stored securely and only Rachel Aaron and Dr. Peter Witt will have access to the records. Both Ms. Aaron and Dr. Witt are at Texas A&M University.

Whom do I contact with questions about the research? If you have questions regarding this evaluation, you may contact Rachel Aaron, (979) 845-1451, raaron55@hikn.tamu.edu, or Peter Witt, (979) 845-7325, pwitt@tamu.edu.

Signature

Please be sure you have read the above information, asked questions and received answers to your satisfaction. You will be given a copy of the consent form for your records. By signing this document, you consent to allow your child to participate in this evaluation.

Signature of Parent/Guardian: _____ Date: _____

Printed Name: _____

Printed Name of Child: _____

VITA

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Research
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