FOSTERING ATTITUDES OF EMPATHY TOWARDS ANIMALS IN YOUTH AGES 4-7 THROUGH PLAY EXPERIENCES IN A ZOO SETTING

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The journey to where life has led me has not been the smoothest path. Returning to school after finding a career and moving my family was not taken lightly. Weighing my options and opportunities it was the best decision. I couldn’t have done any of this without the support of many people that have come into my life.

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Abstract

Zoos are place-based education facilities that have the ability to utilize their natural play spaces to enhance the social and cognitive development of children using live animals. Playing outdoors in nature has shown to increase physical, attentive, cognitive and social development during early childhood. By using place-based learning, zoos can guide children to use different play behaviors to foster attitudes of care and empathy increasing their appreciation to nature.

During the week of July 18th-21st, 2011, observations of children playing at the San Antonio Zoo in the Kronkosky’s Tiny Tot Nature Spot, to determine if children who play in a zoo setting show empathy for animals and an appreciation for nature. 97 children, both boys and girls between the estimated ages of 4-7 were recorded. Five popular play spaces within the children’s area were chosen as observation sites. A coding form and accompanying notebook were used to record observations. Data was collected and coded using different aspects, such as play behaviors per area, boys vs. girls, time spent in an area, actions and language spoken. Children who played in the various play areas showed different levels of empathy towards animals based on the expressions and actions recorded. Further research is needed to include predetermined factors, expanding to more than one zoo, and conduct a longitudinal study to understand long term effects of the role of zoo and nature play areas.
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Ch. 1 Introduction

Background

In 2001 and again in 2008 AZA assessed the visitor learning and understanding on why zoos and aquariums matter, visitors’ knowledge, attitudes and behaviors prior to and the effect after a visit. Studies were conducted at facilities across the United States. The results revealed that people who visit zoos are somewhat already inclined to have an appreciation for nature, although people visit for entertainment and do not think of zoos as conservation organizations. When parents were asked about zoos as educational sites for their children to visit, they agreed strongly that they are “good places for children to experience and appreciate nature and animals.” Fraser and Sickler (2008). They also agreed that they instilled some sort of empathy and moral development towards animals and nature.

I’ve called the Lake Superior Zoo in Duluth, MN home for the past four years. As the education program coordinator I have watched children grow up at the zoo. By participating in zoo camps and classes the children that I have taught continue to come back over and over again expressing their love of animals and how good they make them feel. They enjoy watching the animals play and explore their exhibits and sometimes act out what the animal is doing or tell me how they think the animal is feeling. These children have begun to show an appreciation for animals, showing empathy towards them, and in extension towards nature.

Zoos are designed with not only the animal and their habitat in mind but also the visitor. Research has shown that children develop the most during early childhood and that play is the main way in which children learn (Barbakoff and Yo, 2002; Galizio, Stoll & Hutchins, 2009; Ginsburg, 2007; Gupta, 2009). Unfortunately the Lake Superior Zoo does not have play spaces that are effective examples of playing near animals to show empathy.
The San Antonio Zoo in San Antonio, Texas does provide play spaces in the Kronkosky’s Tiny Tot Nature Spot. The Mission of the San Antonio Zoological Society is “to foster appreciation and concern for all living things.” They are dedicated to providing the highest standards of care for their animals and plant collections; maintain a diverse educational and high quality recreational experience for all visitors and participate in conservation actions that effect Earth’s flora and fauna (retrieved from http://www.sazoo-aq.org/).

The San Antonio Zoo’s first collection of animals was assembled in the 1800s. By 1913 Colonel George W. Brackenridge deeded land over to the city which eventually became the San Antonio Zoo (SAZ). Today they are home to over 3,500 animals encompassing 600 species on 56 acres of land. On average the zoo caters 1,000,000 guests annually with 13,155 of those children participating in educational programs and 80,000 school children on field trips (retrieved from http://www.sazoo-aq.org/). The SAZ created Kronkosky’s Tiny Tot Nature Spot with the developmental needs of early childhood in mind. Their philosophy is “During the first 5 years of life, children learn and develop faster than at any other time in their lives. As young children play and interact with nature, they will learn to process information, develop knowledge and reasoning and create strong bonds that lead to empathy for the natural world. Kronkosky’s Tiny Tot Nature Spot is designed to allow children to explore and play in a variety of natural habitats. Through early immersion with nature, the San Antonio Zoo encourages children to develop an understanding of and an appreciation for nature. Children who GROW WITH NATURE will appreciate nature.” (retrieved from http://www.sazoo-aq.org/). The question that I am setting out to answer is by participating in play at the zoo will children be empathic towards animals showing an appreciation towards nature?

**Purpose Statement**
The purpose of this study was to record and analyze children’s play behaviors in zoo settings. Research has demonstrated the importance and value of play for child development. As non-formal educational facility, zoos have the ability to use unstructured nature play to reinforce the social and cognitive development of children ages 4-7. Zoos are increasingly developing dedicated play areas for children. However, there has been little research on the play behaviors of children in the zoo play areas. This exploratory research looked at play behaviors in one zoo setting.

**Research Question**

*Does playing in a zoo setting contribute to developing empathy in youth towards animals and an appreciation of nature?*

**Definitions**

Play is characterized by qualities of being “… apparently purposeless, voluntary, inherent attraction, freedom from time, diminished consciousness of self, improvisational potential and a continuing desire” (Brown, 2009).

There are different categories of play behaviors. Categories of play were first described by Jambor, Rubin, & Watson (1978) encompassing two of the categories that involve the research question are social play and cognitive play. The four social play behaviors are onlooker, parallel, solitary and unoccupied. Cognitive play behaviors are comprised of constructive, dramatic, and functional play, and games with rules.

Children who do not enter into play behaviors, but watch and/or talk to others is defined by Rubin 2001, as an onlooker play behavior within the social play category. Another social play behavior is parallel play. “Playing parallel to others involves using similar toys and actions as those in close proximity with no attempt to play with others” (Rubin, 2001). Within the zoo setting children are in the company of animals, mimicking their behaviors and playing
similar to them instead of children. In the scope of this research parallel play will refer to the mimicking of animals in close proximity, but not playing directly with the animal. Rubin (2001), defines solitary play behaviors as “playing alone with materials different from children within speaking distance; no conversation with others.” Unoccupied behavior is described by Rubin (2001), as a form of social play associated with “watching anything of passing interest.” Children who“ manipulate the use of objects to construct or to “create” something are involved in constructive play behaviors (Rubin, 2001).” Dramatic play as described by Rubin (2001), is “the substitution of an imaginary situation to satisfy the child’s persona wishes and needs.” When a child uses their “muscles to move repetitively” they are participating in functional play according to Rubin, 2001. Children who are engaged in games with rules are “accepting the prearrangement of rules and the adjustment to these rules” described by Rubin, 2001.

Nature Play is two-fold; not only centered on “playing in nature, but with nature” focusing on being child-centered (Finch, 2009).

Empathy refers to “Matching one’s own feelings with the corresponding feelings of someone else” (Eisenberg-Berg & Mussen, 1978). Since children are observing and playing around animals empathy will include matching one’s own feelings with the corresponding feelings displayed by another animal.

Zoos are facilities that focus on place-based education, which is “the process of using the local community and environment as a starting point to teach curriculum concepts, emphasizing hands-on, real-world learning experiences, increasing academic achievement, developing stronger ties to the community, enhancing students’ appreciation for the natural world, and creating a heightened commitment to serving as active, contributing citizens (Smith & Sobel, 2010).”

Assumption
It is assumed that children who participate in zoo play areas will become connected with nature through the use of animals nearby, empathizing with the animals and fostering nurturing feelings for them.

Limitations

Zoos, nature centers and aquariums are designed with exploration of the natural world in mind. They are at the forefront on conservation education and the most qualified to aid children and parents to discover and reconnect with nature (Ogden & Heimlich, 2009). When families come to these facilities they see what the world has to offer in this regard and encourage them to act on what they have learned during their visit. It is also known that people who visit zoos are already more appreciative of nature (Fraser & Sickler, 2008).

The US is home to 225 AZA accredited zoos and aquariums (retrieved from http://www.aza.org/current-accreditation-list/#l); this study was completed at one of these facilities, limiting the sampling to a small population of zoo visitors. The recorded observations were collected by one observer, limiting the amount of data that could be included in the study. By selecting members of the population in question, I will be generalizing what children in the estimated age range of 4-7 years think about animals when playing in a zoo setting.

Research Question

Does playing in a zoo setting contribute to developing empathy in youth towards animals and an appreciation of nature?

Significance

Zoos are increasingly providing opportunities for unstructured play. The results of this study will indicate if children exhibit play behaviors in zoos that are correlated with developing empathy towards animals and an appreciation for nature. The importance of this study is to see
if children have an increase of awareness of nature through the use of animals and their exhibits in a zoo setting. I believe that this study will be unique in the zoo field in that most assessments conducted are surveys given to adult visitors after experiencing an event, program or exhibit at the zoo (Falk, 1983). In looking at the literature that I have read I have not found any that have observed children in a zoo setting beyond school field trips or that have asked children about their experiences while at the zoo.
Ch. 2 Literature Review

Children today are spending more time indoors “plugged” into electronic devices instead of connecting with nature Louv (2005). The natural world has been described as the classroom without walls, enhancing problem solving, social interaction with others, battling childhood obesity, and the development of motor skills. Preschools, formal schools and non-formal educators are seeing a change in the behaviors of kids due to a lack of outdoor interactions.

“Until the early 1980s children were encouraged to be outside” (Louv, 2005), discovering, playing and not returning home until the streetlights came on. But something changed all that and continues today. The development of technology has been blamed for bringing children indoors and living sedentary lifestyles. Technology isn’t the only reason for this new behavior. The lack of green spaces available to urban youth and the safety concerns of letting children outside without adult supervision has also contributed to keeping kids indoors (Galizio, Stoll, & Hutchins, 2009; Sobel, 1996; Wells, 2000). With the publication of Richard Louv’s book; Last Child in the Woods, Saving our Children from Nature-Deficit Disorder (2005), society has realized that outdoor activities and unstructured play time have become a thing of the past. Parents and teachers are becoming aware of the effects of not including the natural environment in their child’s everyday life.

Child Development

From birth to 8 years of age a child is continuing to grow and develop the most. Learning how to develop motor skills and think critically along with being physically active. At different ages children develop and desire different skill sets. By using “developmentally appropriate practices,” (DAP) (retrieved from http://www.childrenandnature.org/; Oltman, 2002) children will excel both physically and mentally for their age group. During these years children are
learning to take control of their bodies and minds, only focusing on their immediate surroundings. Using their senses helps them to experience hands-on projects set before them (Oltman, 2002). They enjoy being challenged and completing tasks, satisfying the adults in their lives. During these early years they are improving coordination of their body, although they have difficulty making choices and become overwhelmed (Allen & Marotz, 1994). Play is an important part of the development of early childhood (Ginsburg, 2007). Play builds cognitive and the social developmental skills of a child. It also gives them a strong sense of self. Through play they are building their confidence to do the skill sets that are put before them. The four year old child is improving his motor development, being able to balance on one foot (Allen & Marotz, 1994), building taller structures, and throwing an overhand ball, are just a few of them. Their cognitive development is growing to recognize the concepts of bigger and smaller, putting together puzzles and playing board games (Allen & Marotz, 1994). They are socially outgoing and like to join in group activities. Exploring and making new friends is a new step outside of the immediate family.

The four year old child is full of energy, always engaged in an activity. They are learning how to think critically, knowing how to stack blocks from largest to smallest (Allen & Marotz, 1994). Socially they are involved. The five year old child is becoming more self-confident in themselves, stepping more outside of the immediate family, continuing friendships and mastering skill sets in the different development stages of cognitive and social interaction are occurring. As the child turns six and is entering a more complex schooling their skills become more complex, learning how to read and increasing their responsibilities to complete tasks with consequences, both positive and negative. Sensory activities continue to be a main tool for learning as they are using equipment for school projects such as scissors, glue, paints, etc. The National Association for the Education of Young Children (NAEYC, 2009), agrees that the hands-
on approach for primary grade levels is appropriate for their continued development. The six year old child’s cognitive development includes an increase in attention span and the challenge of hard tasks put before them (Oltman, 2002). Socially, they are still learning the ins and outs of friendship, focusing on their needs and wants, but at the same time are self-centered. The seven year old child is cognitively able to begin to understand the concepts of what others think and consciously have empathy for others wants and needs. They understand feelings and a sense of belonging to a group, taking responsibility to a new level (Allen & Marotz, 1994).

**How Children Learn: Play**

Play has been a concept that is hard for researchers to define because the act of play varies from person to person. Brown (2009) defines play as encompassing these main properties: “that it is completely voluntary, purposeless, provides freedom from time diminishes consciousness of self, it’s fun, it has improvisational potential and play gives us a continued desire.” Playing is not a mandatory thing. As humans, we do it because we want to; nobody is forcing us to do these acts. Play has no real purpose in that it we don’t need it to survive and we don’t get paid to do it. When we involve ourselves in play behaviors we lose ourselves in time, giving us a sense of place and being.

Play involves different functions of the body essential in the cognitive development, attentive, social and moral development along with enhancing physical strengths in early childhood (Bergen, 2002; Ginsburg, 2007). Cognitive development involves a strengthening of brain activity, which includes critical thinking, problem solving, and planning. By playing, children are inherently learning how to achieve goals no matter how small the task may be. Playing increases their social and attentive development as well. Children who play learn how to be engaged in an activity, increasing their attentiveness and interacting with those around them. Exploring the world in these ways opens up their imagination and creates a sense of wonder,
which in turn relates them back to real life experiences. Play not only strengthens their minds but also their bodies physically. “Playing increases a child’s mobility and challenges them to use all of their muscles” (Allen & Marotz, 1994).

Play can be categorized into different types of play as well. The two overarching categories are social and cognitive play with subcategories within each. Although there is some overlap within the categories, cognitive play focuses on activities that require more problem solving and critical thinking processes. Social play revolves around interactions with others on different levels of social/antisocial activities. In the social play category there are four subcategories which include; unoccupied behavior, solitary play, onlooker behavior, and parallel play. In the cognitive play subcategories there are also four subcategories which are: dramatic, constructive, and functional play and games with rules (Rubin, 2001). These types of play include participation with others or the movement initiated by others to mimic play behaviors. The children involved will play independently with toys or objects similar to how others [the animal] is playing or responding.

**Structured vs. Unstructured Play**

There are two types of play; structured and unstructured, which are at different ends of the spectrum. Structured play usually involves a set objective, is adult led and has a definite ending. Unstructured play is open to the imagination, has no real objective and is child-centered, child-led (Loy & Yungers, 2011). Within these two extremes there can be levels that involve both. Structured play may also be viewed as a playground with elements that children are supposed to use in a certain manner. Children may decide to utilize them differently than planned by adults, making the play purposeless and child-led instead of what adults originally designed the play space for. This type of play differs from what Brown, 2009, had defined as play, and although he did state that it is hard to completely define as play is different for each
individual. Another degree of structured and unstructured play is also known as free-play, which can happen independently or at the same time. Free-play refers that the children will not be guided by adults on how to act. On the broad spectrum of free-play, children play in and with nature with no man-made structures. Along the lines free-play can include man-made structures, making suggestions for how children could play. These types of play come from the theories established by Dewey and Piaget who both agree that children learn best when they are allowed to actively explore their environment on their own. At the other end of the spectrum is structured play which includes adults setting the rules and having a definite beginning, middle and ending point of play activities.

**Play Theories**

Froebel changed the way we think about early childhood education. In 1840 he invented Kindergarten, “signifying a garden for children, a location where they can observe and interact with nature, and also a garden of children, where they themselves can grow and develop in freedom” (retrieved from http://www.froebelweb.org/). Froebel wanted to give children a sense of being by participating in the world.

Vygotsky, a Russian psychologist in the first half of the twentieth century, was instrumental in the development of understanding the social development of children. His ideas called “sociocultural theory” (Morgan, 1999) connect play and learning through social interactions with others. It was termed this because based on the social and cultural aspects that the child is learning and who he is learning from will inherently shape that child. Vygotsky calls on play as one of the ways in which children learn, but it’s not the only way. In his work he describes play as exhibiting more than one form, later defined by Rubin et al. (2001) as subcategories including Piaget’s four stages of development.
Piaget is best known for his work related to the cognitive development stages in children. These stages; sensorimotor, preoperational, concrete operations and formal operations, focus on sense of self, sense of others and relationships, competition, and manners based on the age and sex of the child (Morgan, 1999; Oltman, 2002). Although each of these stages happen at different ages of a child’s life the focus that Piaget comes back to is that play is essential in human mental and intellectual growth.

In 1914 John Dewey proposed a progressive education movement “The School and Society” school in which he takes what Frobel started in nature experiences and brings it throughout a child’s education. This schooling focused on learning being child-centered guided by real life experiences. He believed in education being active, which eventually lead to experiential education as we know it today (Mondale, 2001).

David Sobel has been influential in continuing Dewey’s work of experiential education. He has taken what Dewey started and expanded to include place-based education, by using local community and environmental education facilities to enhance experiential learning. Sobel has also defined ecophobia as “a fear of the out of doors” (Sobel, 1996), explaining the importance of exposing children to nature during their developmental years. He agrees with Allen and Marotz (1994), in that during these early childhood years their lives are centered around themselves and their immediate surroundings and expanding outward into the world as they grow up. Sobel suggests that to introduce children to nature, there should be stages of exposure. In the early childhood years of four to seven “activities should center on enhancing the development of empathy towards nature” (Sobel, 1996). “Children are inherently drawn to animals; acting like an animal is one of the best ways for a child to develop feelings of empathy towards nature” (Sobel, 2008). When looking at movies and books that are directed for the audience of young children they usually have an animal that is the center theme. Utilizing
animals as a gateway for children to be exposed to nature, showing empathy towards them could help to contribute into other aspects of the natural world.

**Barriers to Play**

The research on unstructured play and how it effects a child’s development was in its early stages back in the 1970’s (Weininger, 1972). Since the publication of Richard Louv’s book in 2005 research groups have been comparing how children played in the 50’s through the early 80’s when technology came to the forefront. What we have learned is that there are three main reasons why kids today are spending more time indoors than out; the advancement of technology, lack of green natural spaces in urban areas and parents encouraging their kids to stay indoors because of safety reasons (Ginsburg, 2007). Arbogast, Kane, Kirwan, and Hertel (2009) state “A child’s ability to enjoy and benefit from nature has changed from adventurous and exciting into an indifferent and a fearful experience. “ This is most likely due to the parents who have put fear into their children with the concept of stranger danger that also was introduced in the early to mid 1980s (Valentine & McKendrick, 1994). Parents are under the pressure to get their children into the best of schools. With this they think that the best thing for their children is to start them early in structured activities that give their child more of an edge; whether it is early reading classes, sports, dance, or music. Time for play has been pushed to the back burner with these activities and in today’s American society where both parents are working, making little time for children to just be children. The responsibilities put upon them are becoming greater at younger ages (Arbogast et al., 2009; Ginsburg, 2007; Louv, 2005; NAEYC, 2009.) creating less time for play and natural childhood development.

**Nature Play**

What we know about outdoor play is that it gives kids a sense of self and increases cognitive skills (Arbogast et al., 2009). Play encourages creative thinking and discovery of the
natural world. It gives them the sense of wonder and to make up games out of things they find along the way. It is also connected with motivational, social, and life skills, self-esteem, sensory stimulation, improving attention, reducing common ailments and stimulating physical development (Goltsman, Kelly, McKay, Algara, & Wight, 2009).

Nature motivates kids to explore, create, and experiment with their own ideas. When adults are not structuring their time kids are able to do things the way that they want to do them. Kids like to share what they find. In one case study a pre-schooler had found a small river running through a natural area where her class was taking a walk. She was excited to show her friends about her discovery. The kids thought that they should try to find a way across the river. Together they brainstormed ideas by drawing pictures. When they returned to the area they explored around looking for different logs to use, testing the different thicknesses of the logs and working together to move it to the river (Galizio et al., 2009). In this case study the kids used social skills, motivational skills and sensory stimulation to accomplish their goal. Because it was their goal and not the adult’s goal the kids were attentive to the project and increased their self-esteem.

In another case study the kids were observed in two different settings to see how they would react and play differently. One group played on a traditional blacktop playground with equipment and was fenced in. The other group had grass, trees and was not fenced in. Observers noticed that kids in the natural setting were more risky when it came to play, climbed trees, and were more active. The kids on the traditional playground were less challenged and were observed not playing (Beate & Sandseter, 2009). This study showed that kids are more adventurous and physically active in natural spaces compared to the traditional structured playgrounds.
It has also been argued that ADD and ADHD (attention deficit disorder and attention deficit hyperactivity disorder respectively) are linked to children spending too much time indoors and not enough time outdoors (Louv, 2005). Children who have a chance to get outdoors and “reboot” their brain are less fidgety in class and are able to focus better because of an outdoor break time (Galizio et al., 2009).

**Empathy**

Empathy has been defined by Eisenberg-Berg & Mussen (1978) as matching one’s own feelings with the corresponding feelings of someone else. Empathy is an important part of a person’s personality and development of their social skills (Hogan, 1969; Roe, 1975). During the stages of early childhood children are innately empathic. Empathy is part of a child finding their sense of self, looking towards others for comfort and wanting to comfort those around them (Clark, 1984). By understanding their own feeling they are then able to understand the feelings of others, relating to them and becoming socially involved in relationships throughout their lives.

In David Sobel’s book *Children and nature design principles*, 2008, he theorizes that children are naturally empathic towards nature when using animals to relate to it. They use animal role play as a form of expression and are an important piece in development of empathy towards the natural world.

**Play and Zoos**

When children visit a zoo they are participating in a place-based learning experience. They are immersed into the world of an animal, anthropomorphizing them and relating to the animal (Clayton, Fraser, & Saunders, 2009; Kellert, 1985; Sobel, 2009.) By relating to the animal in their natural habitat children are easily able to empathize with them creating a connection to the natural world. It has been proposed that connecting children with nature through the use of
zoos and animals will create a desire to appreciate nature and increase the chances that children will continue these behaviors as adults (Kellert, 1985; Rivkin, 2000).

In all of the research that I have reviewed, the youngest group of zoo visitors that were studied on their knowledge of zoos was 11-12 year olds in New Zealand. The children were asked on their beliefs and what they learned after a school visit to the zoo. This study by Davidson, Passmore, & Anderson (2009) focused on what the children saw as important about their learning experiences verses what the educators thought was important. This study did not focus on attitudes or beliefs of conservation or nature, but what experiences children want to learn about and value on a school trip.

Play features, or playgrounds are increasing features at zoos that give a child a chance to run around in a structured area. With the release of Richard Louv’s book No Child left inside, 2005, zoos are also jumping on the bandwagon of connecting children with nature. Some of the barriers that were described in the book included; unsafe neighborhoods, two parents working unable to supervise their children and the fear of going outdoors. Zoos have nature throughout their facilities, with play spaces available in designated areas. Within the last five years zoos have been converting their typical playground areas into areas that mimic or replicate animal habitats for the children to play on. In these areas children are able to “act” like that animal that is in the exhibit adjacent to the play area.

**Zoos**

Zoos have been around for thousands of years (Marino, Lilienfeld, Malamud, Nobis, & Broglio, 2010). They date back to the Roman Empire when they used them for show of exotic animals and fought against them. Zoos have come a long way since then. Today they are required to follow ethical treatment of animals, providing animals with the basic needs. The Association of Zoos and Aquariums (AZA) set standards that encompass health and welfare of
animals, making their habitats in which they reside much like their wild counterparts (Cooper, 2003). The mission of zoos revolves around four main principles of entertainment, conservation, research, and education (Ross & Gillespie, 2009; Smith, Broad, & Weiler, 2008; Ogden & Heimlich, 2009). Every year 600 million people visit zoos and aquariums in the United States (Morgan, 2000), which is more than all major league sports combined (AZA, 1999). The main reason that people visit zoos is for spending family time together (Falk, Reinhard, Vernon, Bronnenkant, Deans, & Heimlich, 2007). Much research has been done over the past 30 years on attitudes that zoos are portraying to people. In the 1970s Churchman (1987), Serrell (1977) and Sommer (1972) all suggested that much research is needed in why zoos and aquariums are here and what do we learn from zoos? The view is that to a spectator a zoo is purely for entertainment. When a visitor leaves a zoo do they take away a conservation message or are they left with misconceptions because they saw animals in small cement cages? Since the 1970s much has changed with the expectations of how animals are housed at the zoo, how they are treated and how people are guided to view the zoo. Conservation messages and education camps and classes are entwined in the zoo experience with the theory that visitors will come away with a better outlook towards zoos, conservation and an environmental ethic (Sommer, 172.) This has been a struggle for zoos to show to the public.

**Why do zoos matter?**

The vast amount of research that has been conducted in zoos focused on animal health, exhibits, visitor demographics and motivations for visiting a zoo (Churchman, 1987.) Few research studies covered visitor knowledge, attitude, and behavior. The surveys conducted at zoos in the early 1990s were directed towards visitor knowledge of such subjects as the benefits of wetlands (Carlin and Foster, 1994) or elephant conservation (Swanagan, 2000). These were front-end evaluations given before an exhibit was built to obtain visitor knowledge of the
subject the zoo was about to “teach” about. The research that was conducted during this time period focused on why adults visited zoos and what they would like to see when visiting. Surprisingly adults visited zoos more if they went as a child and cited that they would like to see more education offered at zoos. But the reason for them to return as adults is for recreation (Falk, Moussouri & Coulson, 1998; Milan & Wourms, 1992; Serrell, 1977). When zoos immerse their visitors into the animal habitat they are giving them an inside look into the animals’ lives and how they view the world. By using immersion, the zoo creates an experience which in turn creates a natural empathy towards animals. As children are introduced to these experiences at a younger age their attitudes towards nature is increased (Cooper, 2003; Vining, 2003.)

In 2001 AZA published “Visitor Learning in Zoos and Aquariums, A Literature Review.” This review established a view of what zoos are accomplishing and where they need to improve. They acknowledge that “little to no systematic research regarding the impact of visitors to individual zoos and aquariums on visitors’ conservation knowledge, awareness, affect, or behavior has been conducted.” They also recognize that there is a significant gap in the views of zoo professionals and visitors.

In 2007 AZA again looked at zoos and how they were viewed; do they leave an impact increasing environmental literacy in visitors? The demographics that AZA surveyed encompassed the public, teachers, political leaders, media, zoo volunteers, spiritual leaders, field biologist, and anti-zoo activists. The general public included parents of young children. In the AZA handbook “Why Zoos and Aquariums Matter?”, parents value zoos as a place for children to develop care and empathy towards nature and the environment. The parents surveyed agreed that they visit zoos for quality family time, entertainment and to learn. They also strongly agreed that nature is a “crucial part of childhood and zoos are good places for children to experience and appreciate nature and animals.” (Falk et al, 2007.)
Zoos & Environmental Education

As I have pointed out zoos are not just for entertainment anymore. They are also considered conservation education facilities that help to instill a sense of appreciation towards the natural world to their visitors. When I wrote the education plan for the Lake Superior Zoo, I looked toward the Tbilisi Declaration of 1977 as a connection between zoos and the environmental education community. Specifically, the first criteria to guide environmental education; “Whereas it is a fact that biological and physical features constitute the natural basis of the human environment, its ethical, social, cultural, and economic dimensions also play their part in determining the lines of approach and the instruments whereby people may understand and better use of natural resources in satisfying their needs” (retrieved from http://www.gdrc.org/uem/ee/tbilisi.html). By developing programs, signs, activities and visitor experiences that revolve around the principles of these objectives, zoos as a whole are working toward the commitment of awareness, knowledge, changing attitudes, developing skills and participating in the natural world in a positive way. When visitors are involved in their visit to zoos and act on the messages before them they are also engaging in improving their environmentally responsible behavior (ERB) in which Hines, Hungerford and Tomera (1986) have established as a goal to be achieved in environmental education.

Zoos as place-based education facilities

Zoos are seen as a place-based learning facility for school field trips, attracting millions of children yearly (Falk, 1983 Davidson et al., 2009). The knowledge that visitors obtain is voluntary and self-directed (Tofield, Coll, Vyle, & Bolstad, 2003.) Children visiting a zoo are involved in informal education, having the choice to read the signs about the animals, learn about conservation messages, or listen to an interpreter at an exhibit. Although teachers realize that they are educational and have value most that choose zoos as a field trip site see it as a free
day of learning, a fun day (Andersen, 2003; Davidson et al., 2009; Tofield et al, 2003.) When children are given free range of the zoo they are less likely to gain knowledge and understanding that zoos matter. When the teacher is invested in the education of their children outside of the classroom by adding assignments related to the class curriculum, the students are more likely to gain knowledge and awareness of the animals and natural environments (Davidson et al., 2009; Andersen, 2003; Jacobson, 1992; Tofield et al., 2003). “Children are one of the main target groups for zoo education (Andersen, 2003),”, so when education departments within the zoo are designing programs, tours and signage, they take into account that their visitor demographics include children as an important consideration. The youngest children to be surveyed at a zoo are 4th graders (about 10-11 year olds) on a school field trip. After participating in a zoo education class the students showed an increase in their cognitive development and a more positive attitude towards nature (Jacobson, 1992). This study is new to the field as a change in attitudes and behavior is less of a focus compared to knowledge obtained (Ogden & Heimlich, 2009). Ogden and Heimlich (2009) also points out that “zoos struggle to add these behavioral outcomes to the conservation message, and more research is critical in addressing the impact that zoos have on visitors and how as a facility they can inspire conservation action.”
Chapter 3 Methodology

Introduction

The purpose of this study was to record and analyze children’s play behaviors in zoo settings. Research has demonstrated the importance and value of play for child development. The importance of this study is to see if children have an increase of awareness of nature through the use of animals and their exhibits in a zoo setting. The types of play used for observation were the guiding framework to determine if the children displayed empathy towards animals and nature. There were two main objectives; the first objective was to determine what types of play occurred in a zoo setting. The second objective was to determine if children who engaged in play in a natural setting within a zoo expressed empathic feelings or actions towards animals and nature.

The methods used to complete this research were qualitative in nature using grounded theory, as described by Creswell, (2009), and Glaser and Strauss, (1967); the observations that I described were reflective of children’s attitudes towards nature and animals based on their play activities. Qualitative research involved the perspective of the researcher. Since I was involved in zoo education I recognized that I would have a bias towards a positive outcome that zoos have a positive effect on children that leads to an appreciation of nature. During the observations of the subjects I kept my personal interpretation and views to the reflection portion of my research and only recorded direct observations both visual and audible. Observations of children playing included collecting both visual and audio of the children based on their play activities.

Setting

The subjects were observed at the San Antonio Zoo in San Antonio, Texas. The area specifically designed for young children is called Kronkosky’s Tiny Tot Nature Spot (KTTNS). Observations took place during the week of July 18th-22nd, 2011. There were a total of five play
areas where observation took place. They included; the prairie dog tunnel/bug detectives, Fishing, Coati, Riverbanks, and Camping, see appendices for pictures of areas.

Play Areas

There were a total of five play areas that were the most appealing for children to play at. The prairie dog tunnel/bug detective area was an inside area which included a crawl through area where terrariums of different insects were displayed. At the back of the play area there was a tunnel that when you crawled to the end of it you popped up in a plastic bubble that placed you in the middle of the prairie dog exhibit. The prairie dogs were also visible from outside of the tunnel through a floor to ceiling glass window. Also in this area was a bug detective tunnel which exhibited different invertebrates that one would find underground. This area was adjacent to a large window that had real fish at a child’s eye view. The fishing area had a large aquarium in the back featuring native fish. In the middle of the fishing area there was a small pond with magnetic fish and poles for children to catch fish. There was also an aquarium with a puppet show where children could put on a play. Both these areas are located in the Discovery House within the KTTNS. The camping, Coati, riverbanks play areas were all located outside. The coati play area was a simple tunnel that children could crawl through and be “right next to” the coati crawling through the tunnel at the same time on the other side of the exhibit glass. The Riverbanks area was one of the bigger areas, including a sandy beach with a “river” to play in. In the sandy area there were tortoise shells for children to crawl through, climb on or hide in. The tortoise shells were representative of the Aldabra tortoises that were adjacent to the play area. The camping area was a large area outside that had several elements of play. There was a small brook for children to walk through, but not deep or large enough to play in like the riverbanks. There were logs to crawl through, a tent and picnic area were dramatic play took place. At the back of the area there was a fish pond had a rocking dock where visitors could
go and feed fish during scheduled times. There were a few areas of play that I did not record observations at because I did not see children utilize these areas. They were the sloth/monkey hang and the large field. The sloth/monkey exhibits were outside and had an element where children could hang like these animals. The large field was a nature area which contained no toys or elements. Children were encouraged to make up a game or play activity in this area. I suspect the low foot traffic through these areas because they were tucked behind other well highlighted areas of play and in the case of the large field, with no animals to view or toys to play on I noticed families just walking by it as a green space void of activity.

Throughout the duration of the observations I rotated my time between the different areas based on foot traffic within the area, weather, and if an area was closed. During time spent at each station I also recorded length of time participants spent at each area. Not all participants stayed long enough to record a time, but for those who did an average time per area were recorded.

**Subjects**

The children selected were from families with children between the estimated ages of 4-7 and based on their play behavior. Children not playing were noted, but not observed until they engaged in a play behavior. Random selection of children was based first on if they look to be in the age range of the study and if they engaged in play behaviors. Although demographics of the children were recorded, children were not chosen based on race, sex, or disability. Only apparent age was the criteria for selection. The quantity of children observed was based on attendance at SAZ and visitors coming to play in KTTNS during the days observations were conducted. Observations included visual and audible observations. Data collected was later transcribed and categorized based on the definitions of play included in the study along with emotional reactions, audible expressions, and demographics.
The number of children observed for the duration of the study was n=97. Of the 97 children observed 43 were girls and 54 were boys. The dominant ethnic backgrounds of the children were Hispanic and white where in Texas the population reflects this demographic. The child’s ethnicity was based on their physical appearance (Appendix D). These children were selected based on their age and if they were engaged in a play behavior outlined in the definitions of play and scope of this study. The age of the child observed was determined based on an estimated range from previous studies on child development during early childhood and on my knowledge of age and play behaviors.

**Procedures**

The children that were observed were estimated to be between the ages of 4-7 that were actively engaged in play behavior. Using systematic observations (Mills, 1980) one child at a time was selected for observation in a play area. The behaviors were recorded between the normal business hours of 9 am and 5 pm in KTTNS during the dates from July 18th through July 21st, 2011. The instruments used were a coding form (Appendix A) that had population demographics, play behaviors, play location, time and date. A participation number was also recorded that coordinated with a detailed summary notebook of that child’s activities. Observations and researcher reflections were also recorded in a journal. All parents that questioned the observations taking place were given contact information (Appendix B) and a brief overview (Appendix C) of the research project.

**Analysis**

The definitions of play guided the observations and notes taken during observation. To analyze the data obtained a qualitative approach was used. Themes emerged from the analysis of observations of behaviors, actions, and speech of the children. The data collected shows the types of play behaviors which were exhibited by children playing in the zoo setting. Data
collected included but was not limited to researcher observations, spoken words related to the play behaviors by the children being observed along with quotes, actions and interactions with adults and other children.
Ch. 4 Results

Data Analysis

This study was designed to answer the question: “Does playing in a zoo setting contribute to developing empathy in youth towards animals and an appreciation of nature?”

This exploratory, qualitative study was conducted at the San Antonio Zoo in San Antonio, Texas from July 18\textsuperscript{th}-21\textsuperscript{st}, 2011, in the Kronkosky’s Tiny Tot Nature Spot (KTTNS) using a qualitative approach in grounded theory. The theory provided by Sobel, 2008, that children identify with animals showing “an inherent empathy” for them will be used to answer my research question adapting to a zoo setting. Theories by Dewy, Piaget, Vygotsky, and Froebel that children use play to develop and relate to the natural world, benefiting from participating in it were used to show the development of skills using the play areas in this place-based facility. All observations were based on my recording of how the child played and supported by the definitions which were the guiding framework of the study. The data was collected by observations of children in the age demographics and transcribed based on their physical actions and verbal communications. Body language was recorded for children and family members that were speaking Spanish.

Observations noted that the English speaking children had matching speaking words and body language. For example if a child was excited and said “cool animal” I would also notice laughter and smiles. In the same situation if the children was speaking Spanish, the body language would I would observe would be smiling and pointing at the animal. This would tell me that the child liked the animal in some positive way, even if I didn’t necessarily know exactly what was said.

To code the data I divided the participants into several subgroups using both lumping and in vivo, or splitting the coding (Saldana, 2011), to determine if there were trends in play behaviors by area, gender, times spent in areas, inside versus outside play areas and also words and actions expressed by parents of the children. Observations were recorded using a coding
form (Appendix A) where demographic information of children and play behaviors were collected. A notebook was also used to record additional observations included but not limited to expressions by children and accompanying adults, actions, and play activities. The number of children observed in this study included 97 participants; 54 boys and 43 girls. Gender was recorded to identify different play behaviors displayed by gender. Of those 97; 50 were Hispanic, 41 white, 3 black and 3 Asian or Pacific Islander.

**Setting and Subjects**

The data collected was taken during the summer months. In Texas these extreme temperatures may have caused people not to visit and be outside, or stay and play for a shorter time than they would have if the temperature was cooler. One such instance was when I heard a grandparent tell her granddaughters “Why do you want to play outside where it’s so hot? Let’s go back to my house and play inside where it’s air conditioned.”

In some areas there were several children and it was difficult to focus on everyone, I randomly picked the first one to enter the area. Others were recorded but not to the detail of the main child. There were three areas that were outside and two main areas inside.

If I was located inside I could not see if an area outside was more popular during that time frame. I moved with the foot traffic to get the maximum amount of participants. The time spent in an area would determine if a child was able to occupy themselves based on activities presented to them, making some areas more appealing to play at longer than others. In regards to play behaviors I only counted the behavior once per child even if the child repeated the behavior several times.

On the last day of observation the staff was unable to keep the pH and chemical balance of the water healthy. All water areas were closed for the day; these included the riverbanks, camping, and fishing areas, limiting observations to prairie dogs and Coati.
Play Behaviors

The play behaviors that were observed and recorded included; unoccupied, parallel, functional, solitary, dramatic, games with rules, onlooker, constructive, nature play, adult-centered and child-centered. The definitions of play behaviors were the guiding framework and are addressed in chapter two. Although all play behaviors within the social and cognitive play behaviors were recorded; parallel, functional, dramatic, nature play and child-centered were the focus of the study as they helped to answer the question. These behaviors were recorded based on if I observed a child doing the behavior at least once. If the child continued to do the behavior it was recorded in detailed notes but only counted as one tally. If the child was recorded as doing parallel play and switched to dramatic and back to parallel play, the parallel play was already noted and not counted again since it was the same child. One child could be observed doing more than one behavior and then they would be marked in the different play categories.

The most observed behaviors were functional, parallel, and nature play. These behaviors were categorized as child-centered play. All play areas were designed to be child-centered; meaning that all exhibits were at child height, age appropriate language and activities displayed where children can make their own play choices. When categorizing between adult-centered and child-centered play; an adult-centered activity referred to if a parent told the child to do a play behavior. If a child did it without parental involvement it was tallied as child-centered play. 9 of the children were coded as participating in adult-centered play. An example of adult-centered play observed was “Johnny, crawl up the tunnel,” or “Go in the tent and go camping.” This type of play was very similar to child-centered play but unimaginative and led to parents shuffling their children through the play areas. Of the 97 total children observed, 71 were coded as engaged in child-centered play. The missing 17 children were children that were
observed as a secondary child to the main child being observed. Their actions and words were recorded because they interacted with the main child.

The play behaviors were divided between boys and girls to determine if a difference in gender played a role in behavior. Play behaviors were comparable between the genders except for solitary play. Boys were more likely to play alone than girls. There was also a slight increase in nature play in girls than boys. Since play behaviors were similar no further coding of genders were analyzed. Table one shows the types of play behaviors exhibited by boys vs. girls.

Table 1
Play Behaviors Exhibited by Boys vs. Girls

<table>
<thead>
<tr>
<th>Play Behaviors</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>unoccupied</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>parallel</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>functional</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>solitary</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>dramatic</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>games with rules</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>onlooker</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>constructive</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>nature play</td>
<td>19</td>
<td>24</td>
</tr>
</tbody>
</table>

Play Behaviors by area

The frequency and type of play behaviors varied among the play areas (Table 2). In the prairie dog/bug detective area parallel play was the dominant form of play. This is due to the fact that KTTNS provided a tunnel for children to crawl through that paralleled the activity of a prairie dog; the child was actually involved in the exhibit. Children were mimicking or paralleling what the animal does. This was also true at the Coati exhibit where children could mimic what the animal does; crawling through the log to find food. The camping and riverbanks were the
two areas that nature play was observed. Nature play is defined as not only playing in nature, but with nature. These areas included nature to play in and with, whereas in the discovery house children were not engaged in natural nature but man-made nature not made of natural materials, but metal and plastic. Children used nature to make up own games with rules in the water, such as “who can swim like a crocodile” “who can run the fastest through the water,” The sand at the riverbanks allowed children to build or construct sand creations, which in turn leads to a repetitive movement, or functional play. Children repeated these activity behaviors over and over again. The camping area provided children with picnic toys and a tent to role play “house” and activities associated with dramatic play. “When children are put in a situation that reminds them of a familiar place or object they tend to dramatize this in play activities” (Rubin, 2001). Table two shows the type of play behavior by area.

Table 2
Play Behavior by Area

<table>
<thead>
<tr>
<th>Play behaviors</th>
<th>Prairie Dogs</th>
<th>Fishing</th>
<th>Coati</th>
<th>Riverbanks</th>
<th>camp</th>
<th>totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>unoccupied</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>parallel</td>
<td>20</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>40</td>
</tr>
<tr>
<td>functional</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>9</td>
<td>22</td>
<td>48</td>
</tr>
<tr>
<td>solitary</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>dramatic</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>games with rules</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>onlooker</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>constructive</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>nature play</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>17</td>
<td>22</td>
<td>43</td>
</tr>
<tr>
<td>adult-centered</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>child-centered</td>
<td>19</td>
<td>7</td>
<td>3</td>
<td>13</td>
<td>29</td>
<td>71</td>
</tr>
</tbody>
</table>

Average play time

The Riverbanks was the most appealing play area for both parents and children. Families that knew of the area came prepared and stayed for an average of 20.9 minutes. On a typical
day I spent an average of 8 hours observing children playing within the designated play areas.

Figure one shows the average amount of time children spent in each area. The Coati play area is skewed due to the activity that was happening during the time of observation. The staff had an enrichment activity for the children to help with; when they were done the staff placed the enrichments, treats, in with the Coatis. The children stayed longer to see if the animal would pick their treat. During the rest of the observation period children were rarely seen staying more than 3 minutes. The prairie dog and fishing areas are adjacent to each other with simple activities. Children were seen running back and forth between the two areas several times creating a longer visit inside the Discovery House. At each play station signs were placed to show children how to play and gave tips to parents on to be involved in helping their children explore the outdoors. I did not see parents actively reading the signs or even children looking at them. Unless the sign told the visitor what the animal was they did not take time to read the sign. The time represented in figure one was consistent among all play activities in these areas.

Figure 1
Average time in play area

<table>
<thead>
<tr>
<th>Average Time in Play Area min/hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coati</td>
</tr>
<tr>
<td>Riverbanks</td>
</tr>
<tr>
<td>Camp</td>
</tr>
<tr>
<td>Prairie Dogs</td>
</tr>
<tr>
<td>Fishing</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Themes

There were three main themes that emerged with the children and a fourth theme of parental involvement. The children’s themes were empathy, pretend play, and power play. The parental theme emerged as data was collected and saw that children responded on what their parents said and did.

Empathy

The data collected include the verbal and physical actions of the children. The coding was split in several different ways. First I coded them by area and gender. This was to determine if certain areas were more appealing to one sex over the other. Even though I did observe both genders playing in all areas, boys’ and girls’ play behaviors, language, and actions were different in the different play areas.

In the prairie dog area more boys than girls were inclined to crawl in the tunnel and look at the bugs in the adjacent exhibit. Boys also played pretend here rather than girls showed in other areas. The girls in this area expressed how “cute” the prairie dogs were, but said “ewww” to the bugs. Even through children would express an initial negative comment; they would come back to that animal several times to observe it. Girls tended to use words like “cute”, whereas boys would use words such as “awesome” or “cool.” This language and behavior patterns of boys and girls was the same in the fishing area which is adjacent to the prairie dogs.

The Riverbanks showed little communication and more physical play. The types of communication observed revolved around rules that boys used to play games, such as running through the water the fastest, acting like an animal and using the logs, tortoise shells, and rocks in the area.
The camping area was where the girls dominated play activities. The sense of familiarity with house and home brought them to participate in dramatic play, pretending to not only be the “mom, or child” but also the animal which was more of the role the boys played in the other areas. Girls were also observed crawling through the logs more than boys, splashing and jumping in the water where boys showed these characteristics in the prairie dog, fishing and riverbanks areas.

The language displayed by the children demonstrated that children displayed empathy towards animals. Children were naturally inclined to play and become immersed into the play area. They were recorded saying positive emotions such as “aww, so cute” “I want to stay longer” or “look, I’m said animal”. By observing children ask questions that involve a problem and a solution I was able to conclude that the child was being cognitively active. One example would be looking at the fish in the fishing area. There was an Alligator gar in the aquarium. One boy asked “What type of fish is that?” “It looks like an alligator with its long nose and sharp looking teeth.” He was using prior knowledge of what another animal looked like to help answer his question. These comments reflect that children are empathic towards animals and show an appreciation for the natural world.

Pretend play

Pretend play was another theme that emerged from the observations. Children loved to pretend to “be” or “do” something that wasn’t part of their everyday life. Pretend play occurred in all areas. In some areas the boys were more likely to pretend than girls such as the fishing play area or the prairie dogs. In these areas boys pretended to fish for real fish, or be the prairie dog popping it’s head up in the middle of the exhibit. In the camping area the girls pretended to be the “mom” and cook or clean up the campsite for the other children. The boys pretended to be the Coati, crawling through the tunnel and the girls were more likely to be Aldabra tortoises
in the riverbanks. Overall children immersed themselves in the environment that they were playing in, becoming that animal or becoming part of the exhibit. Children pretending to play were showing care for the environment presented before them and empathy for that animal.

Pretend play falls under the category of cognitive dramatic play behaviors. When children demonstrate actions that they have seen, mimicking them, they are relating, showing that they empathize with that person or in this case animal.

**Power Play**

I also split the coding into outside and inside play areas to see if there was a difference in the physical and mental activities. The inside activities included the fishing and prairie dog areas inside the Discovery House. The outside areas were comprised by the camping, Coati and riverbanks areas. When an animal was present as in the case of the prairie dog and fishing areas (both are inside play areas) more words were spoken than in areas where animals were not present such as the riverbanks (outside) which nature play was the dominant focus. Some expressions such as “cool”, “awesome fish” or “cute prairie dog” were often heard. The Prairie dogs were active both below ground and above. Children often would ask what they were doing. The riverbanks did have Aldabra tortoises but were not always out on exhibit. Along with the Coatis exhibit; if the Coatis didn’t crawl through the tunnel at the same time as the child the connection was lost. The outside activities saw more physical activity due a larger area for children to run. The activities that were presented for the children to partake in made it possible for them to be more physically active. Children were more inquisitive outside than inside. When activities were presented the children would simply use them and then “make up” what they wanted to do in that area, whether it was to play a game with rules, construct something out of sand, or pretend they were that animal. ‘Activities’ refers to structures that children can use their imagination to create play. An example of this would be the tunnels that were created to
crawl through to mimic the animal. Children asked more probing questions regarding what they were seeing or doing. They would ask multiple questions about one animal, what it was, what it ate, what it is doing; critically thinking about the animal and what they were experiencing. Children were observed pointing and watching the animals then going to play like them, showing that children made a connection to the animal and the environment around them. The power play theme also included children always in motion. They were full of energy. It didn’t matter what play area they were in they found a way to be physically active. Whether it was crawling through a tunnel, digging or building in the sand, swimming, running; children were always in motion. The children who participated in active play behaviors were more likely to do more than one behavior than those who were onlooker or unoccupied. Children who were in motion tended to stay active utilizing several play behaviors. Few children were observed from going from onlooker into an active play behavior.

Parents

The focus of this research was observations of children, but my observational notes included notes about the parents. Parents showed a different perspective of play at a zoo and reactions towards animals and nature. Throughout the duration of my observations I also noted the words and reactions of the parents. This in turn was an important piece of the research in that the children’s own words and reactions were influenced by the parents’ or caregivers’ interaction. There were four types of parents; the picture happy parents, the engaged parents who encouraged play, the texting parents, and the “we came, we saw, now let’s go” parents.

The engaged parents where the ones that I observed at the riverbanks. They were in their swimsuits sitting in the water right along with their children, building and creating sand creations. These parents were observed mostly at the riverbanks and in the camp area. In the camp area they would be in the stream with them, helping them in and out of the tent and
rocking on the dock with them. These parents stayed in the play areas longer encouraging their children to stay, play and explore.

The texting parents were just that. They sat on their phones texting instead of watching or engaging in their children’s activities. I saw one parent texting while her child was trying to show her the “fish” he caught. Although she didn’t see what he was actually doing she responded with “Good job Buddy!”, and continued to text on her phone. When she was finished texting she told her son it was time to go. I noticed this trend quite a few times where the parents would let their children play so they could be on their phone, when they were done then it was time to go, paying no attention to what their child was experiencing.

The “we came, we saw, now let’s go!” parents were always on the move. They needed to get through the whole zoo, never stopping. The children of these parents must know this about them as they often ran ahead to play and do as much as they could before their parents caught up to make them move to the next exhibit. These children did ask to stay longer, some parents responded with “they didn’t come to a zoo to play” to lying to their children that the area was going to be closing so they needed to leave. These were also the parents that said “no” the most and didn’t want their children to get dirty or wet. When approaching an exhibit these parents would tell their children that they didn’t know what the animal was or if they couldn’t find it right away that the exhibit was empty.

The picture happy parents had their cameras out, taking pictures of their children doing everything. They would tell them to go do something so they could take their picture there. These parents also fit into the “we came, we saw, now let’s go!” category and the engaged parents. For example the parents would tell their child to crawl in the prairie dog tunnel, take a picture then tell them it’s time to go do something else. On the other hand they would not only take the picture but then tell them to go play for a little while, encouraging play behaviors.
The children whose parents were engaged were the children that were more active, engaged in the activities and stayed the longest at the exhibits. The engaged parents were the ones observed reading the signs to their children and ask them questions about what they were seeing. This is in contrast to most other parents and visitors who walked by the signs, not reading them. Children that were allowed to stay and play were noticeably happier, showed a greater interest in the details of the area and left when they were satisfied.
Ch. 5 Conclusions

Discussion

The goal of this study was to find out if playing in a zoo setting contributes to developing empathy towards animals and an appreciation for nature. To obtain this observational research, data collection, interpretation, and coding were required. The definitions of play by Brown (2009,) and Rubin (2001) discussed in the literature review were used as a guiding framework for interpretation.

The activities that were presented for children to participate in were designed for their developmental needs and abilities. According to Allen & Marotz (1994) children are focusing on their wants and needs. They center activities that revolve on them; activities that they can do on their own with approval from the adults in their lives. During my observations I recorded children doing things that they could do on their own, repetitive or functional play activities that centered on their abilities such as building a sand sculpture. Most of the children were engaged in child-centered play while in the play areas at the zoo. As noted by Chawla (2007), that childhood experiences relate to actions taken as adults. She goes on to survey adults who participated in outdoor activities or had a special place to play as a child. As adults they were more likely to be involved in “pro-environmental attitudes and behaviors.” She along with others base this on the grounded theory of ecological psychology descended William James. By including humans in the web of life instead of seeing us as outsiders we are assuming dependency on the world and its resources. Through this humans discover the limitations of nature, forming an understanding and appreciation for it (Chawla, 2007). In another study done by Chawla (2006), the people that were more likely to invest in environmental causes, or issues protecting a place, was due to the fact that they related to it as a childhood experience, growing up playing or participating in family activities there. These examples show that children that
grow up, playing and participating in nature empathize with nature and show an appreciation for it as adults.

The play behaviors were divided between boys and girls to determine if a difference in gender played a role in behavior. Play behaviors were comparable between the genders except solitary play. Boys were more likely to play alone than girls. While I can only speculate, in the activities that I observed boys playing, vs. girls playing they wanted to accomplish the task on their own. One example would be in the fishing area, fishing for the magnetic fish. They wanted to show their parents that they could do it. The same happened on the beach at the riverbanks. If they were building a sand structure they wanted to do it themselves. I recorded one boy telling his brother that he didn’t want any help and wanted to do it himself. There was also a slight increase in nature play in girls than boys. Having experience raising young boys, nature play for them might be more adventurous, such as climbing trees and being involved in a “rough and tumble” sort of play rather than playing pretend outdoors. These behaviors are described by Brown, (2009) in his book Play. Here he indentifies that girls are more likely to play “dress up” and act out life through these mediums while boys require a certain amount of rough and tumble play to discover the boundaries of social activities and life in general. Utilizing these theories one can assume that when combining boys “can do” attitude and girls “pretend play” in the outdoors they are relating to nature in their own way on their terms creating a level of empathy towards their surroundings.

Allen & Marotz (1994) also states that during the early childhood years children are full of energy, always in motion. This was one of the themes that emerged throughout the study: power play. Children were always on the move, whether it was running to do an activity, crawling through a tunnel or digging in the sand, children were full of energy. The play activities not only strengthen their physical abilities but also their minds. The children that were observed
were attentive to the activities, repeating them over and over again, such as using the fishing pole to fish. The children used problem solving to identify how the animal lives based on the activity that was put before them. By crawling in the Prairie dog tunnel, children observed how they dig and make their homes. These simple tasks contribute to strengthening attentive and cognitive development in early childhood. Being full of energy for a child relates back to the benefits of play. When children are more active, their cognitive, social and attentive abilities are increased (Arbogast et al., 2009; Pellegrini, Huberty, Jones, 1995; Rivkin, 1997;”Recess-It’s Indispensable” 2009). They are able to use critical thinking to solve a problem that they might face, become socially active with the people that they are surrounded with and are able to concentrate on activities for a longer period of time. When children are engaged socially with others, working with them to reach a common goal, such as building a sand structure, they are demonstrating that they show empathy for that other person, caring for the thoughts of others. When integrating nature and animals into this equation, children are connecting not only to giving them a sense of place to discover and explore but also to the other living plants and animals in that space. This is connecting back to what Chawla (2006) was describing that adults that connected to spaces as children were more likely to be involved in the outdoors later in life, whether it is continued family activities or protection of the spaces of their childhood. When looking at the parent behavior categories; engaged parents, picture happy, texting and we came, we saw, now let’s go!, their attitude towards play impacted on how the child reacted. From my observations the children that had engaged parents were happy, asked more questions, and stayed longer at the play areas. The children were the ones who decided that they were done playing and time to move on. I personally feel that these children were the ones that got the most out of their experiences and developed a connection to the play area and animal more so that the children that were rushed out of the areas. The picture happy parents
fell into a couple of different categories, they were either strictly picture parents, engaged parents or we came, we saw now let’s go! More times than not they were the ones that wanted to leave right away. It was almost like these parents wanted to show others how involved they were with their children because they took so many pictures of the doing things with their children. While there is no proof of this being the case, being a parent myself and having personal knowledge of parent behavior I can only assume that this is in part the case. The texting parents were there in the physical form for their children but not mentally available. Their children were allowed to stay and play as long as they were texting. When parents were done texting, so was their child’s play time. If their child wanted to show them something that they has accomplished they would just agree with their child, never looking up to see what they actually did. From my observations these children developed their own sense of connection to the area, wanting to show their parents that they could accomplish something, anything, as long as they got approval from them. The children of the parents “we came, we saw, now let’s go!,” they were rushed through the play areas, exhibits, and animals I don’t even think that they had a chance to connect to them at all. Their observation time was less than a minute, leaving little time to find the animal, ask what it is, and play in the area. From my observations these children were the ones who were always being told “no”, “don’t do that”, “don’t go there” “there’s nothing in there, the exhibit is empty.” I would assume that children that are always being told “no” are ones that stop asking questions and expecting a positive answer, that they begin to not care or connect to real objects such as an animal.

I found that most children that engaged in play behaviors developed a sense of empathy towards the animal and/ or nature. Each child expressed this in a different way, either through actions or language. One of the themes that emerged was a theme of empathetic language. Children expressed through speech how they wanted to be that animal, mimicking its behaviors,
how they would like to care for that animal. Some children even expressed how they thought the animal might be feeling, assigning anthropomorphic characteristics. This demonstrates that empathy exists. Although I don’t know if playing was the cause of the empathy, or if it already existed in the child, having prior knowledge and experiences, I can say that it contributed to the empathic feelings in the children.

Children are innately drawn to nature to play and discover. When playing in a zoo setting children are exposed to different animals that they may never get the opportunity to see in the wild. In the zoo children are able to get a close up animal experience and it this study able to identify with the animal by using play as a way of obtaining knowledge about them. Coatis are a South American animal that live in the Amazon rainforest. In my opinion it is unlikely that the majority of children would have the experience of traveling to South America to witness one in the wild. Zoos give visitors the knowledge of these exotic animals and understanding of their life.

The KTTNS at the San Antonio Zoo provided children with the opportunity to play, explore, and discover the natural world through play activities immersed within zoo exhibits. SAZ and the KTTNS area are equipped with the tools necessary to help children learn and discover animals and nature through play activities. They have used different elements to promote the different areas of development; physical, social, cognitive and attentive. By using their animals as a guide they have designed an area that includes all play behaviors to stimulate the child’s mind and body. Even though the target audience is 2-5 years of age, I observed children of all ages enjoying the different areas of play, immersing themselves into nature.

Another part of zoo education is interpretation. Although staff and volunteers cannot be present all day every day at every exhibit explaining the animal or how to use the play area, signs about the animal and habitat are posted to give visitors that knowledge. During my
observations I did not see the majority of parents actively reading the signs or even children looking at them. Unless the sign told the visitor what the animal was they did not take time to read the sign. According to Ross and Gillespie (2009), visitors spend about 90 seconds at an exhibit whether they read the informational sign or not. This could also be true for how adults view the play areas and account for times spent in each.

**Implications for Environmental Education**

One of the missions tied to zoos is education. Zoo’s are a resource that provide connections to nature and the environment through the animals that they house, the exhibits themselves, interpretational signs and camps and classes. They are an important tool in teaching youth and the public about environmental issues, connecting the far and away exotic destinations that most will never experience to their backyards. When families bring children at an early age to zoos parents are giving them “the opportunity for connecting with living animals and nature” (Fraser & Sickler, 2008). This is accomplished through the fundamental ways that children develop and learn; playing. By expanding this experience and immersing them into the exhibits, giving them the opportunity to explore, discover and learn at their level of understanding creates a greater empathy for the animals and the environment in which they live in. Giving children these tools early on will help them to succeed in understanding the natural environment.

Zoos, if used as a resource, not only for families but for school groups of any age and focus of study, which could help increase the knowledge of understanding. In a study by Jacobson (1992), “students showed an increase in their cognitive development and a more positive attitude towards nature after participating in a zoo education class.” Although this study was on older children and only one class it showed that there are increased positive benefits from visiting a zoo.
Suggestions for Future Research

The research presented here I believe to be a starting point for further research. The data collected pertained to one zoo and was a snapshot of how children react while playing in a zoo setting. Zoos across the nation and the world have embraced the theme of connecting or reconnecting children with nature, designing and building play spaces for children to learn about animals and connecting them to their native lands. Further research could include replication of this research at many zoos. It could also expand into a longitudinal or case study, following a group of children that played in zoos versus a control group that did not have these experiences. This could show the long term effects and benefits of zoos and aquariums.

Fraser and Sickler (2008) in their research “why zoos & aquariums matter handbook”, interviewed parents regarding the topics of empathy and connections to nature. Parents responded with “yes”, they believe that zoos do accomplish this for their children. By interviewing the children of these parents this might give a better insight into how parents decided what their child’s feelings were.

I followed children of families on a day trip to the zoo. I have no knowledge if these are zoo members or tourists. Using a questionnaire with tourists vs. returning visitors could determine how much prior knowledge of at least this setting and the connection that they have to the area. A further research project could be to follow the children who attend zoo camps and classes: How does interacting with non-family members in a camp or class setting change the dynamics of play behaviors in the play areas?

I came into this research with an understanding of the natural world and an environmental education approach to the benefits of connecting children and animals through play. Using a psychological approach to why children are empathic towards animals could lead to a better understanding of the connection to play behaviors observed.
Recommendations for San Antonio Zoo

The San Antonio Zoo has developed a play space that has the potential to reach the 13,155 children who participating in educational programs and 80,000 school children on field trips annually (retrieved from http://www.sazoo-aq.org/). By highlighting the play area to these children the zoo could expand their developmental skills and at the same time enhance environmentally responsible behavior. Does KTTNS accomplish their goal? Do they provide developmentally appropriate activities for their target audience? Based on my observations I feel that SAZ does meet the goals of their mission “Children who grow with nature, will appreciate nature” (retrieved from http://www.sazoo-aq.org/.) They provide a variety of elements that help promote developmentally appropriate activities but can always change elements that are not utilized. Some examples for improvements might be to look at the spaces that are underutilized. One piece of coding that I used was to categorize by developmental skills; physical, cognitive, social and attentive for both the inside and outside play areas. All areas had at least one physical element in place. One example would be the Coati area. There is only the tunnel for the children to crawl through. There is no manipulative or cognitive aspect to engage the children for a longer period of time. This is in contrast to the prairie dog area in which there is a physical element along with points of interest for the children to inquire about. These include the bug tunnel, terrariums of insects, hiding places and big window to view the prairie dogs. By adding manipulative activities to the play area children could become more engaged, playing for a longer period of time.

Some examples for improvements might be to look at the spaces that are underutilized. The sloth/monkey hang area was virtually vacant during my visit. The element to hang from was made of metal, getting to hot for children to play on. The tropics area, were there was an open field to be creative in was also a dead zone. Children today need some amount of structure to
tell them, go play, and be creative. I saw so many families just walk right by because there was “nothing to see” there. Maybe put an animal in there or make it an animal exercise play yard and children can come and play with/next to the animal.

Suggestions for parental involvement would include more benches. Parents and grandparents were always searching for a place to sit and watch their children play. Since there were little to no places to sit, they kept the children moving. Although this doesn’t promote parental involvement in play, it allows parents to let their children play, explore and discover longer than if there is nowhere to rest. To encourage child’s play a recommendation would be to include the parents in a non-traditional sense. Make elements that are made for parents to enjoy and experience what their children are experiencing. One example would be to make a prairie dog tunnel for parents to be able to fit into and pop up into the exhibit. I tried doing this in the child’s tunnel and couldn’t even kneel. When immersed in the exhibit it felt like I knew how they lived. Some parents might want to be involved in the play areas but the elements are too small for them. If exhibits were also designed to include larger elements for parents to experience it as well, they might be more inclined to stay longer and see what their children are experiencing.

Conclusion

Does playing in a zoo setting contribute to developing empathy in youth towards animals and an appreciation of nature? The results in this study are narrow due to the scope of the research. According to the data collected through this research, the children’s language and actions showed that they indeed demonstrated some level of empathy towards animals. Parallel, functional, and dramatic play behaviors have all been linked to the development of empathy and an appreciation of nature. All three of these play behaviors and nature play were observed in the zoo play areas. The play opportunities enhanced their visit, giving them a
connection to the animals and nature. Children responded to the animals and the play areas in a positive manner.

I believe that zoos are a place-based education facilities that have the responsibility to reconnect children to nature through the animals in their care. The education that zoos are providing to visitors is priceless in that they are able to reach a variety of people on different levels of knowledge. For children this means using the basic fundamentals of childhood development to foster empathy for animals and an appreciation of nature. “If we aspire to developmentally appropriate science education, then the first task is to become animals, to understand them from the inside out, before asking children to study them or save them” (Sobel, 1996).
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# Appendix A

## Coding Form

Date: ___________________________  Play location: ___________________________  Play time: __________

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<th>B - Asian or Pacific Islander</th>
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<td>D - Hispanic</td>
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<td></td>
<td>E - White</td>
<td></td>
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Approx age: 4  5  6  7  8  9  older than 9

### Play Behaviors

- **Unoccupied**
- **Parallel**
- **Functional**
- **Adult-centered**
- **Solitary**
- **Dramatic**
- **Games with rules**
- **Child-centered**
- **Onlooker**
- **Constructive**
- **Nature Play**

### Notes:

## Coding Form

Date: ___________________________  Play location: ___________________________  Play time: __________

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<thead>
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<th>Gender:</th>
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<th>Ethnic:</th>
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Approx age: 4  5  6  7  8  9  older than 9

### Play Behaviors

- **Unoccupied**
- **Parallel**
- **Functional**
- **Adult-centered**
- **Solitary**
- **Dramatic**
- **Games with rules**
- **Child-centered**
- **Onlooker**
- **Constructive**
- **Nature Play**

### Notes:
Appendix B

Parental Information Form

Background Information

This study is being conducted by: Heidi Faris, Center of Environmental Education; University of Minnesota-Duluth.

The purpose of this study is: to gain insight into play behaviors of children ages 4-7 in a zoo setting.

*What play behaviors are observed in a zoo setting that are associated with empathy towards animals and an appreciation for nature in children ages 4-7?*

Contacts and Questions:

The researcher conducting this study is: Heidi Faris. You may ask any questions you have now. If you have questions later, you are encouraged to contact Heidi at faris019@d.umn.edu or advisor Bruce Munson at bmunson@d.umn.edu or both by phone at 218-726-6324.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects’ Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.
Appendix C

Dialogue to Parents

Hi my name is Heidi and I am a graduate student at the University of Minnesota-Duluth. I am doing a research project of children’s play behaviors in a zoo setting and how playing here contributes to their empathy for animals and nature. If you have any questions regarding my study here is a parent information form to keep for your records.
# Appendix D

## Ethnicity

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</table>
Appendix E

Pictures of Play Areas

E1
Map of research area
E 2
Riverbanks play area
E3
*Tortoise shell next to Aldabra tortoises and riverbanks*
E4
Sign at riverbanks

E5
Prairie dog exhibit and crawl tunnel
E6
Prairie dog sign

E7
Camping play area
E8
Sign at camping play area

E9
Coati crawl tunnel
E10
Sign at Coati play area

E11
Rocking dock at back of camping area
E12
Sign at rocking dock area

E13
Fishing play area; frog waterbed

E14
Fishing play area; underwater theater with fish tank
E15
Fishing play area