GROWING MINDS:

THE RELATIONSHIP BETWEEN PARENTAL ATTITUDES ABOUT CHILDREN SPENDING TIME OUTDOORS AND THEIR CHILDREN'S OVERALL HEALTH

A Thesis

by

DANIELLE ERICA HAMMOND

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

MASTER OF SCIENCE

December 2009

Major Subject: Horticulture

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Approved by:

Chair of Committee,	Jayne Zajicek
Committee Members,	Tina Waliczek Cade
	Gary Briers
Head of Department,	Tim Davis

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ABSTRACT

Growing Minds: The Relationship between Parental Attitudes About Children Spending Time Outdoors and Their Children's Overall Health. (December 2009)

Danielle Erica Hammond, B.S., Brigham Young University Idaho

Chair of Advisory Committee: Dr. Jayne Zajicek

The objective of this study was to investigate the relationship between the attitudes of parents toward outdoor environments and their children spending time outdoors, and how these attitudes related to their children's overall health. The sample for this study consisted of parents of six to thirteen year old children from the U.S., who accessed the survey from the Aggie Horticulture homepage between March and August 2009. Surveys were collected until 142 completed questionnaires were received. The online questionnaire included questions about parents' attitude toward nature; their children playing outdoors, play site rating, and children's overall health and demographic questions.

Descriptive statistics were used to tabulate mean scores on the Parental Attitude About Nature Scale, and Parental Attitude About Their Children Spending Time Outdoors Scale, both of which indicated overall positive views. Pearson's product-moment correlations indicated statistically significant relationships between the Parental Attitude About Nature Scale, and Parental Attitude About Their Children Spending Time Outdoors Scale (P=0.001), and between these two scales and time children spent

outdoors (*P*=0.008, P=0.05). No correlation existed between Parental Attitude About Their Children Spending Time Outdoors score and the Health Problems score (*P*=0.459). Also, there were statistically significant relationships between time spent indoors on video games or watching TV and health problems of children (*r*=+0.182, *P*=0.031), congestion (*r*=+0.192, *P*=0.023), and children having trouble sleeping (*r*=+0.237, *P*=0.005); asthma attacks and with the time spent in indoor organized sports (*r*=+0.274, *P*=0.001) and outdoor organized sports (*r*=+0.177, *P*=0.036). Additionally, time spent outdoors in free play was negatively correlated with body pain or discomfort (*r*=¯0.219, *P*=0.009), repeated upset stomach (*r*=¯0.179, *P*=0.034), or feeling tired or having low energy (*r*=¯0.289, *P*=0.001). In regards to play areas a post-hoc analysis (Tukey's HSD) revealed that all the outdoor play scene pictures had statistically significantly higher mean scores in ratings of approval by parents (*P*=0.001) when compared to the indoor play area and that the outdoor scene picture with the black hardtop surface had a statistically significantly lower mean score (P=0.001) than the other outdoor play scene pictures. This indicated that, in general, parents preferred play areas with a greater amount of natural elements.

DEDICATION

I dedicate this to my friend, Karen Dee Goodson, for all her inspiration and for showing me so much of nature's beauty. I also dedicate this to my brother, Joshua, for inspiring me to work hard and live my life fully.

ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Zajicek, and my committee members, Dr. Cade, and Dr. Briers, for their guidance and support throughout the course of this research.

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CHAPTER I

INTRODUCTION

"*In my grandparents' day, most people spent the better part of their lives outdoors.*"

Richard Louv (2008, p. ix)

Health problems in children and adults have become an increasing concern in the United States. According to the National Center for Health Statistics, one major concern is the prevalence of asthma, which has continued to remain historically high after the drastic increase in asthma between the 1980's and late 1990's (Akinbami, 2006). Another major health concern on the rise is obesity. One survey stated that 66% of American adults are either overweight or obese (National Center for Health Statistics, 2007a). Between 1988 and 2004, the number of overweight children between the ages of 2 to 5 has increased from 7.2 to 13.9%, and the number of overweight children between the ages of 6 to 19 years increased from 11 to 19% (National Center for Health Statistics, 2007b). In a study conducted on children under the age of 13, it was found that only about half an hour a week was spent outdoors doing activities such as gardening, picnicking, walking and hiking, while about 12 hours were spent indoors watching TV (Hofferth and Sandberg, 2001b).

Children ages 12 to 14 now spend only 50 minutes per weekend day doing sports and outdoor activities (Juster et al., 2004). Even with the reports of positive health benefits from spending time outdoors, children are spending increasingly more time

This thesis follows the style of Horttechnology.

indoors (Juster et al., 2004). Several studies suggested that outdoor safety issues are a large concern for parents (Farley et al., 2007; Valentine and McKendrick, 1997). These include accidents, abduction, and of violent strangers. In addition, avoiding unsafe activities such as teen joy rides, and crimes such as murders were all concerns reported by parents (Valentine and McKendrick, 1997). When children are provided with a safe and quality play area, Farley et al, (2007) found that there was a large increase in the total number of children spending time outdoors. This suggested that one solution to increasing quality outdoor activities for children may be to provide a quality, safe and close public green space.

This increase in time spent indoors has been reported to affect children's dietary habits. Children who stayed inside and watched more television tended to eat less fruits and vegetables, and consumed other less nutritious foods (Coon et al., 2001). Because of these dietary trends, a decreased amount of time spent outdoors has been associated with obesity in a variety of ways. More TV viewing has been connected with greater gain of body fat in children, especially when it was combined with a sedentary lifestyle (Proctor et al., 2003). Children who watched more TV consumed more unhealthy foods and drinks and they also reported eating more total calories in comparison to children who watched less TV (Blass et al., 2006; Coon et al., 2001). In turn, children who spent more time playing outdoors reported higher amounts of physical activity and tended to have a lower body mass index (Ludvigsson et al., 2007).

The decrease in amount of time spent outdoors has other health effects. One reported effect is that exposure to indoor allergens, rather than outdoor allergens, significantly contributed to the development of asthma (Halken, 2003).

In addition to unhealthy dietary habits and an increase in asthma in children who spent increased time indoors is the reduction of vitamin D production due to lack of time spent in the sunshine. Having a deficiency in vitamin D increases susceptibility for maladies such as cardiovascular disease, diabetes, infections, cancer, osteoporosis, falls and fractures (Florez et al., 2007).

Health benefits from spending time outdoors are not just limited to reductions in allergies and weight. Studies have shown that spending time outdoors and around green spaces can reduce stress in adults and children. For example, just walking through a botanic garden was shown to be effective in reducing stress (Wells, and Evens, 2003). Also, in another study, children who were around more natural conditions rated their self-worth higher, and they reported that stressful events became less stressful (Kohlleppel et al., 2002).

Statement of Purpose

The purpose of this study was to investigate the relationship between attitudes of parents toward outdoor environments, and their children spending time outdoors, and how these attitudes related to their children's overall health.

Objectives

1. To study parental attitude toward outdoor environments.

2. To study parental attitude about their children spending time outdoors.

3. To investigate the correlation between parental attitude toward outdoor environments and their attitude about their children spending time outdoors.

4. To study the relationship between the amount of time children spend playing outdoors vs. the amount of time they spend doing indoor activities and their overall health.

5. To examine the correlations between parental attitude toward outdoor environments and, their attitude about their children spending time outdoors and the amount of time children spend in various activities.

6. To study the relationship between parental attitude about their children spending time outdoors and their children's overall health.

7. To compare parental preferences for play areas based on the natural and artificial elements of the setting.

The following hypotheses will be tested:

H1: There will be a positive relationship between parents attitude about nature and their attitude about their children spending time outdoors.

H2: Children of parents who have a positive attitude about nature will spend more time outdoors.

H3: Children who spend more time outdoors will have fewer overall health problems.

H4: Parents will prefer settings which are neither completely natural nor completely artificial, but which have a mixture of elements.

Definition of Terms

Allergies: "The mounting of inappropriate immune responses to one or more harmless substances. The result is the onset of an excessive inflammatory reaction" (Harvard Medical School, 2009a, p. 1).

Attention Deficit Disorder: ADD is a disorder characterized by patterns of abnormal inattention which is both persistent and impairing (American Psychiatric Association, 2000).

Atopic Eczema: "A chronic inflammatory skin condition that usually initially appears in young children who have an inherited predisposition to allergies. Many children with atopic dermatitis go on to develop atopic (allergic) rhinitis or atopic (allergic) asthma" (Harvard Medical School, 2009a, p. 1).

Atopic Rhinitis: "A seasonal or year-round allergic condition marked by sneezing, runny nose, and congestion. The most common type of allergy, it is caused by an IgE-mediated immune response" (Harvard Medical School, 2009a, p. 1).

Body Mass Index (BMI): "An estimate of an individual's relative body fat calculated from his or her height and weight" (Harvard Medical School, 2009b, p. 2).

Conjunctivitus: "Inflammation of the conjunctiva of the eye. Conjunctivitis is the most common eye allergy" (Harvard Medical School, 2009c, p. 3).

Diabetes: "A systemic condition in which a person's body is unable to convert sugars and other nutrients into energy. Levels of blood glucose, or sugar, are elevated. Excess body weight raises the risk of developing this condition. People with diabetes often experience foot disorders" (Harvard Medical School, 2009d, p. 4).

Obesity: "Excess body fat, usually defined as a body mass index of 30 or more" (Harvard Medical School, 2009e, p. 13).

Seasonal Affective Disorder: "Sadness and depression that's brought on by a lack of exposure to sunlight" (Harvard Medical School, 2009f, p. 16).

Basic Assumptions

1. It was assumed that participants answered the survey questionnaire honestly, and were not biased from any source.
2. It was assumed that participants answered the survey just once.
3. It was assumed that the population sample was representative of the target population.

Limitations

1. Research conducted on humans has extraneous factors that influence the outcomes of the study.
2. Non-experimental research cannot completely neutralize all variables.

Delimitations

The participants in this study were delimited to people who were able to access the Internet. This sample was further delimited to individuals who when visiting the website where the instrument was hosted, self-selected themselves to participate in the study during the time period in which the study was posted. Finally it was delimited to parents of children who were 6-13 years old.

CHAPTER II

REVIEW OF LITERATURE

Children and Indoor vs. Outdoor Activity

Of increasing concern and interest in the U.S. is the rise in the amount of time children spend indoors. A study done on children under the age of 13 found that approximately half an hour a week was spent outdoors by children doing activities such as gardening, picnicking, playing, walking and hiking (Hofferth and Sandberg, 2001b). In contrast, approximately 12 hours were spent indoors by children watching TV (Hofferth and Sandberg, 2001b). Similarly, another study found that children ages 12 to 14 now spend about 50 minutes during the weekend and about 4.5 hours during the week on sports and outdoor activity in contrast to over an hour and 6.5 hours respectively by children of similar ages during the 1980's (Juster et al., 2004). A related study found that during a normal week, about 18% of children participated in outdoor activities, as opposed to 97% of children who watched TV (Hofferth and Sandberg, 2001a). Presently, computer and video game playing also occupy much of children's time (Juster et al., 2004). Today's children are now spending between 1 and 2.5 hours during the weekend and 30 min to 1 hour on weekdays playing video games. Computer time also occupies children, with children aged 6 to 8 spending 1 hour a week and 15 to 17 year olds averaging about 4 hours a week on a computer (Juster et al., 2004).

Dietary Habits, Physical Activity, and Obesity of Children

Research has indicated that children who spend increased time indoors have poorer health and unhealthy dietary habits (Coon et al., 2001). Children consumed more

unhealthy food and drinks and a larger number of total calories in comparison to children who watched less TV (Blass et al., 2006; Coon et al., 2001). Children who stayed inside and watched more TV ate fewer fruits and vegetables, and they consumed fewer other types of nutritious foods (Coon et al., 2001). Specifically, it was reported that children who watched more than 5 hours of TV per day displayed greater unhealthy eating habits, such as consuming fewer fruits and vegetables, and higher amounts of snack foods. This unhealthy eating behavior was still evident 5 years later, indicating a long-term relationship between the types of activities children choose to engage in and their diet (Barr-Anderson et al., 2009).

In contrast, children who participated in the outdoor activity of gardening, both increased their preferences for vegetables and also consumed more fruits and vegetables when compared to their preferences and consumptive patterns prior to their gardening programs (Lautenschlager and Smith, 2007; Morris and Zidenberg-Cherr, 2002). Other outdoor activities, such as sports participation, also were linked to a higher consumption of fruits, salads and fruit juices and thus a greater intake of micronutrients (Cavadini et al., 2000). Also, it was reported that the quantity of time a child spent outdoors was strongly associated with how physically active they were and an inverse correlation with how much TV they viewed (Burdette et al., 2004; Sallis et al., 1993).

Negative dietary habits and obesity have also been associated with activity levels and time spent indoors. More TV viewing has been connected with greater gain of body fat in children, especially when it was combined with a sedentary lifestyle (Dennison et al., 2002; Proctor et al., 2003). Children who spent more time playing

outdoors and had a higher amount of physical activity tended to have a lower body mass index (BMI) (Ludvigsson et al., 2007). This trend of unhealthy eating due to more TV viewing is not confined to present habits, but in fact can have far-reaching consequences (Barr-Anderson et al., 2009).

Another way outdoor activities affect children's health is through physical activity. One study found that television viewing was associated with higher BMI and light-intensity physical activities, and negatively associated with cardio-respiratory fitness and moderate to difficult intensity physical activity (Pettee et al., 2008). Research has found that children, who were exposed to an outdoor playground, and used the playground in a physically active way gained the physical activity that was important in maintaining a lower BMI and a healthier weight (Farley et al., 2007).

Other research has indicated that 24% of children played in natural outdoor areas as part of their after-school play activities (Cunningham et al., 1996). Preschool children exposed to natural outdoor areas participated in more physically demanding play, and in turn developed better motor skills (Fjortoft, 2004). In another study, researchers measured children's BMI at the beginning and end of a two year period. It was found that after those two years, children who lived in a neighborhood that had more green spaces tended to have lower BMI scores on average, and had less of a chance of increasing their BMI when compared to children who lived in less green neighborhoods (Bell et al., 2008). This may be because activity in an indoor environment is physically constrained, as opposed to an outdoor environment. In addition, the increased outdoor

physical activity helped children maintain good cholesterol levels early-on in their lives (Suter and Hawes, 1992).

All of the factors listed above have led to another major health concern for children in the U.S., which is obesity. The National Center for Health Statistics (2007a) reported that the number of overweight children among 2 to 5 year olds had increased from 7.2% to 13.9% between 1988 and 2004. Obesity had also increased from 11% to 19% among 6 to11 year olds and 11-17% among 12 to 19 year olds during the same time period (National Center for Health Statistics, 2007a). This survey also reported that 66% of American adults were either overweight or obese (National Center for Health Statistics, 2007b).

Obesity in children and adults is a major concern for several reasons. First, there are many health risks associated with obesity, such as hypertension, high cholesterol, type II diabetes, sleep apnea and some cancers (Center for Disease Control and Prevention, 2007). Type II diabetes presents a serious health concern, and has been growing in prevalence among children across the world at the same time as increased obesity rates (Pinhas-Hamiel and Zeitler, 2005; Rosenbloom et al., 1999). Another important consideration is that obesity does not just go away as a child grows into adulthood. In fact, Whitaker et al. (1997) reported that a child who was obese was more likely to be obese as an adult whether or not their parents were obese, but was twice as likely if they had an obese parent. Another similar study found that children between the ages of 8 and 18 whose weight was in the 75th percentile were twice as likely to be

overweight at age 35 compared to those children at the 50th percentile (Guo and Chumlea, 1999).

Due to the previously mentioned health risks in children and adults, a rise in hospital visits caused by obesity-related health issues has been reported (Wang and Dietz, 2002). These health issues include diabetes, sleep apnea and gall bladder disease. In addition, it was reported that obesity had a negative impact on asthma, increasing asthma hospital visits by approximately 40% (Wang and Dietz, 2002). This has resulted in annual hospital costs for obesity-related problems rising from $35 million to $127 million (adjusted for inflation between 1979 and 1999) (Wang and Dietz, 2002). More specifically, a related study reported that medical expenditures for overweight children were more than 12% a year higher when compared to those costs for non-overweight children (Johnson et al., 2006).

Finally, one last concern with overweight and obesity during childhood is that they are associated with weight-related and emotional distress. Problems with depression, anxiety and peer-teasing are more likely to occur, with overweight children being three times more likely to be teased about their appearance when compared to non-overweight children (Hayden-Wade et al., 2005; Young-Hyman et al., 2006). Obese children also have more difficulties forming friendships when compared to non-obese children, as obese children are 50% less likely to be named as a friend by another child when compared to non-obese children (Young-Hyman et al., 2006). Similarly, another study found that obese teenage boys and girls reported hanging out with their friends less and feeling like their friends did not care about them (Falkner et al., 2001).

Other Health Concerns and Types of Activity in Children

Simply as a health behavior, outdoor play can be associated with preventing different illnesses in children (Watanabe et al., 2006). Concurrent with an increase of children's indoor activity time and rise of obesity, other health problems in children have become an increasing concern in the U.S. Specifically on the rise are problems relating to asthma and allergies. According to the American Academy of Allergy, Asthma and Immunology (2007), approximately 50 million people in the U.S. are affected with allergies of some sort. Allergic disease is the 5th most common disease throughout all ages and the 3rd most common chronic disease in children under 18 years old (American Academy of Allergy Asthma and Immunology, 2007). In a recent study, Akinbami (2006) found that approximately half of all citizens of the U.S. tested positive for at least one allergen.

Additionally, according to Akinbami (2006), the prevalence for asthma has continued to remain historically high after the drastic increase in asthma between the 1980s and late 1990s. This is of concern for several reasons. The annual cost of asthma and allergies in the United States is about 5.8 billion dollars (Smith et al., 1997). These costs include such things as medicine and office and hospital visits. It also includes the costs of indirect consequences of having asthma and allergies such as school loss, sick days and restricted activity (Smith et al., 1997). Asthma has additional health consequences beyond breathing difficulties. For example, asthmatic adolescents also have reported feeling more lonely and have more psychosomatic symptoms when compared to non-asthmatic adolescents (Forero et al., 1996).

Asthma and allergies have many causes, not all of which are known (Tamay et al., 2007). However there are many correlations that have been identified which could be associated with where children spend their time, indoors or outdoors. Exposure to indoor allergens, rather than outdoor allergens, has been shown to be a significant factor in the development of asthma (Halken, 2003). For example, early sensitization to indoor dust mites is associated with asthma later in life (Capristo et al. 2004; Kuehr et al.,1995; Sporik et al., 1990). In addition, it has been suggested that increased exposure to indoor allergens like dust mites at a young age is the cause of a greater prevalence of allergies (Squillace et al., 1997).

Changes in habits, such as children spending more time sitting in front of the TV or playing video games, have decreased the amount of physical activity children participate in and also increased exposure to indoor allergens causing an increase in asthma development (Ring et al., 2001). However, living on a farm or on an area of large acreage has been reported to expose children to important outdoor allergies lowering the risk of asthma (Dimich-Ward et al., 2006). Furthermore, allergies have been shown to be prevented and managed better when children have had a greater intake of fruits and vegetables in their diet (Tamay et al., 2007). One study found that when children took more of their calories from starches, cereals and vegetables, their symptoms of wheeze, allergic rhinoconjunctivitis and atopic eczema decreased (Ellwood et al., 2001). Another study found that eating vegetables, and fruit was a protective factor in children against symptoms such as wheezing and shortness of breath. On the other hand, eating butter

and margarine was associated with increased symptoms of shortness of breath and wheezing (Farchi et al., 2003).

Increased vitamin D production is another health benefit derived from children spending more time outdoors in the sunshine. Having a deficiency in vitamin D increases susceptibility for certain illnesses such as cardiovascular disease, diabetes, infections, cancer, osteoporosis, and fractures (Florez et al., 2007). In addition, lower vitamin D levels are linked to poor insulin production, less leg strength and increased risk to colorectal cancer (Raloff, 2004). Many foods are fortified with vitamin D; however, the most effective way to gain vitamin D is to spend time outdoors in the sunshine. In fact, people who reported participating in outdoor exercise were 47% less likely to be deficient in vitamin D. This increases the importance of spending time outdoors for those who are overweight because they have more risk of being vitamin D deficient (Florez et al., 2007). Overweight and obese children are also at risk of being vitamin D deficient with obese children having significantly lower vitamin D concentrations when compared to non-obese children (Reinehr et al., 2007).

Time Spent Outdoors and Psychological Health

Health benefits from spending time outdoors are not just limited to reductions in allergies and weight. Kaplan and Kaplan (1989) reported that, in general, people with access to nearby nature have been found to be healthier when compared to other individuals with beneficial impacts including increased satisfaction with their home, job and life. According to one biophilia theory, humans are still dependent intellectually, emotionally and physically on their relationship with nature, and it may be essential for

human health and development (Maller et al., 2002). Recent surveys seem to support this theory in that 61% of those surveyed stated some sort of a natural environment as their favorite place, and 40% of people stated that being around plants made them feel calmer (Maller et al., 2002).

Having plants around can improve quality of life in many ways such as environmentally, economically, socially and physically (Zampini, 1994). For example, many people agreed that they felt more comfortable and rated their health higher when they had plants in their office (Fjeld, 2000; Lohr and Pearson-Mims, 2000). They also felt better about their jobs, the work that they did and their quality of life (Dravinge et al., 2008). One study also found that students who had plants in their classroom evaluated the course higher in areas of learning, enthusiasm and organization when compared to students who did not have plants in their classroom (Doxey et al., 2009). These differences were especially apparent in classrooms that had few or no natural elements such as windows. In another study, plants noticeably reduced health complaints and measurably improved the environment where they were placed (Wood, 2003). This was especially noticed in the ways that plants improved the air quality in a room. When air quality was improved, performance of typical office work also improved (Wood, 2003).

Vegetation can also affect people's appraisal of places, with people rating places with vegetation more positively, as having a higher quality of life, and having less crime when compared to places without (Gorham et al., 2009; Sheets and Manzer, 1991). Also, most people agreed that overall, plants were desirable, and that plants made them

feel calmer and more relaxed (Frumkin, 2001). When asked or observed, children also favored outdoor settings, especially ones that included an abundance of nature (Chawla 2002, Korpela, 2002). As one child put it:

> I like to be in peace here, (natural setting) it is a small place but I can be alone . . . here we feel better than in our homes, because I already live in a village where many trucks pass by, especially in the afternoon; therefore, there is not much quietness to study. Here there is more silence, there is fresh air, so we feel better (Moritari, 2000, p. 106).

Studies have shown that spending time outdoors and around green spaces helped reduce stress levels. For example, just walking through a botanic garden was shown to be effective in reducing stress (Kohlleppel et al., 2002). People who were under more stress reported more benefits from visiting a park (Orsega-Smith et al., 2004). However, it has been found that those people who not only visited the park, but stayed longer had lower blood pressure when compared to people who reported shorter visits (Orsega-Smith et al., 2004). The effect that nature had on stress was not limited to a one time intervention. Having nature nearby moderated and buffered stress on a more consistent basis. One study found that when children were around highly natural conditions, they rated their self-worth higher, and that stressful events had less impact (Wells, and Evens, 2003).

Aside from reducing stress, contact with nature can have several psychological benefits for children. For example, natural areas can also help children's concentration. In one study they found that female children who had natural areas around their homes

displayed higher levels of concentration and more inhibition of impulses when compared to female children with fewer natural areas around their home (Taylor et al. 2002). Also, children who moved from homes with less natural areas to homes with greater amounts of natural areas developed a greater ability to concentrate and direct their attention (Wells, 2000).

Furthermore, children who attended camps located in natural settings experienced positive changes in their self-esteem and interpersonal relationships. These children also displayed more curiosity and eagerness and a decreased interest in TV (Dresner and Gill, 1994). Teens at risk for drug use who attended a camp and participated in outdoor activities also reported decreased drug use and an improvement in self-esteem and scores on a depression inventory (Davies and Cohen, 1995).

Finally, spending time outdoors can also help children develop creativity and complexity of thought. When both male and female children were playing in outdoor spaces, they actively participated in more complex and creative play than when these same children played in barren spaces (Taylor et al. 1998). Also, children who spent time in outdoor spaces came to appreciate quiet down time and reflection more and developed more complex, less concrete thoughts about what makes life good (Moritari, 2000).

Increased contact with nature has been reported to help both adults and children having certain psychological diseases. For example a simple, effective and inexpensive treatment for people suffering from Seasonal Affective Disorder (SAD) is to

go outside for a short walk in the winter time instead of using artificial lights for light therapy (Wirz-Justice et al., 1996).

In addition, contact with nature has been reported to help children with Attention Deficit Disorder (ADD). Children with ADD who participated in outdoor activities showed fewer symptoms when compared to children who participated in indoor activities (Kuo and Taylor, 2004). In addition, it has been reported that children who played in indoor windowless settings had more severe symptoms of ADD (Taylor, Kuo and Sullivan, 2001). This decrease in symptoms of ADD seemed to be more related to just being in a natural setting rather than physical exercise itself (Kuo and Taylor, 2004).

Parental Attitude About Spending Time Outdoors

Even with all of the above-mentioned health benefits of outdoor activity, it is reported that children are spending increasingly more time indoors rather than outdoors (Hofferth and Sandberg, 2001b). Several studies suggested that safety was one major factor influencing parents to keep children indoors (Farley et al., 2007, Molnar et al., 2004, Valentine and McKendrick, 1997). Veitch et al. (2006) reported that for 94% of parents, the most common factor that influenced where their children played was concern for their child's safety.

The concept of safety encompasses many parental concerns including safety from accidents and traffic, from being abducted, and from violent strangers such as gang members, as well as avoiding unsafe activities such as teen joy rides, and crimes such as murders (Valentine and McKendrick, 1997, Veitch et al., 2006). Gielen et al. (2004)

concurred, finding that drug dealers, violence and unsafe road conditions were all reasons parents limited their children's outdoor play time.

Researchers have suggested that safety issues can be reduced by simple modifications in the landscape (Davison and Lawson, 2006; Kuo et al., 1998). For example, Stamps (2005) found that when people looked at an area, the lighting of the area was the most important factor in deciding if the area looked safe or not. Pedestrian safety was also a concern since it was reported that the more streets with sidewalks there were in a neighborhood, the more children there were walking and cycling to school when compared to neighborhoods with fewer sidewalks (Davison and Lawson, 2006). When provided with a safe and quality play area, Farley and Merriwether et al., (2007) found that there was a large increase in the total number of children spending time outdoors as opposed to an area not provided with quality play space.

In the city, natural landscaping encouraged greater use of those areas. One reason could be related to feelings of safety. Herzog and Chernick (2000) found that perceived danger was higher in urban areas except where green spaces were present and maintained. These maintained green spaces were related to feelings of tranquility and negatively related to perceived danger (Herzog and Chernick, 2000). Another study found that residents preferred more trees and felt safer if the turf was maintained (Kuo et al., 1998). Particularly, it was found that areas that had trees attracted a more diverse and larger group of people, especially when the trees were more densely packed and located close to housing units (Coley et al., 1997). Taylor et al. (1998) had similar results and found that areas that were barren and lacking green elements, had fewer

children playing and less adult supervision. This suggested that simple things such as providing a quality, safe and close public green space may improve the safety and increase the number of opportunities children have for outdoor play.

Parental attitude and behaviors concerning outdoor play constitute another major influence on whether children spend time outdoors. For instance, parents' outdoor recreation time and the time fathers spent playing outdoors with their sons', was associated with both daughters' and sons' outdoor activities (Beets et al., 2007). Because mothers' support of outdoor play was found to be important, having safe places where mothers could take their children, especially their daughters, may be effective in raising girls' activity levels. The amount of green space and mothers' attitudes about their children spending time outdoors seems to be somewhat interconnected. For example, it was found that mothers who lived in areas with greater availability of green space gave greater worth to experiences their children had when they are alone outside (Prezza et al., 2005).

CHAPTER III

METHODOLOGY

This chapter will present information about the target population of this study, as well as the instrumentation, data collection and analysis used to fulfill this study's purpose. The purpose of this study was to investigate the relationship between attitudes of parents toward outdoor environments, and their children spending time outdoors, and how these attitudes relate to their children's overall health.

Population

The target population for this study was parents of six to thirteen year old children in the U.S. The sample for this study consisted of parents of six to thirteen year old children from across the U.S., who accessed the survey from the Aggie Horticulture homepage (aggie-horticulture.tamu.edu) between March and August 2009. This was one of the limitations of the study in that parents were self-selected and volunteered to participate in the survey. Surveys were continuously collected until 142 completed questionnaires were received. Two responses were not in the U.S. and were removed from data analysis. Thus 140 responses were used for the final data analysis. According to Dillman (2007) these responses were considered representative in order to conduct inferential statistics with a 10% sampling error at the 95% confidence level. Furthermore, Gay and Airasian (2003) stated, "for correlational studies at least 30 participants are needed to establish the existence or nonexistence of a relationship" (p. 112).

Instrumentation

The instrument used for this study was composed of sections that asked parents about their attitude toward nature, their attitude about their young children spending time outdoors, and how much time their children actually spend in outdoor activities. It also included general health questions regarding their children and standard demographic questions (Appendix A).

This instrument was developed using Dillman's (2007) tailored survey method. This survey method is based on research from social science and statistics, and involves different techniques for designing an instrument based on its needs, the population and the method of deployment. This method communictes guidelines on wording questions, survey layout and formatting answer choices in order to generate more accurate responses and a better response rate (Dillman, 2007). For example, for this study, both sides of the attitude scales were included and there were an equal number of positive and negative choices. Also, all questions were reviewed by other researchers to avoid complicated language and the use of double-barreled questions, which are questions that combine two or more issues. The instrument was also evaluated by other researchers and experts for face and content validity.

Parental Attitude Toward Nature Instrumentation

Parental Attitude Toward Nature instrument was written with questions pertaining to attitudes parents have about nature. These questions were adapted from other studies about attitudes toward nature and parents' attitudes toward other childhood activities and were modified to fit the topic of nature specifically (Ennis, 2003; Murphy,

1984; Piotrowski, 2007; Skelly, 1997). Parents were asked to rate various statements relating to their attitude toward nature and outdoor settings on a six-point Likert-type scale (Likert, 1967) with the possible responses ranging from "strongly agree" to "strongly disagree". Graduate students and agricultural and horticultural researchers evaluated this section of the instrument for face and content validity.

Parental Attitude About Their Young Children Spending Time Outdoors Instrumentation

In this section, parents responded to statements about their concern for their children spending time outdoors due to various factors. These statements were answered on a six-point Likert-type (Likert, 1967) scale with the responses ranging from "strongly agree" to "strongly disagree." These statements were modified from similar studies examining these parental attitudes (Ennis, 2003; McMillan, 2003; Murphy, 1984; Piotrwoski, 2007; Timperio, et al., 2004; Weir, et al., 2006). Dillman's (2007) method was also used in this section to structure questions and to create appropriate responses. Graduate students and agricultural and horticultural researchers evaluated this section of the instrument for face and content validity.

Photographs of Play Area Section

The photographs of play area section of the instrument was developed using photographs of children's play areas taken in several different types of places with varying elements. Five different photographs were included, with the play area ranging from completely natural (no man-made structures visible) to completely artificial (indoor play environment, no natural elements visible). Parents viewed the scene and were then asked to evaluate each of the photographs shown in regards to the statement, "I feel

completely comfortable allowing my child to play in an area like this with appropriate supervision." The possible responses were then answered on a six-point Likert-type scale (Likert, 1967) with responses ranging from "strongly agree" to "strongly disagree."

Children's Health Problems Instrumentation

The health inventory section of the instrument was developed with questions adapted from several health inventories and was designed to measure children's general health (Liberatos, 2007; Welsh, 2006). Questions were drawn from Liberatos (2007) questionnaire which investigated children's health with survey questions developed by children's health practitioners. Liberatos' (2007) questionnaire was pre-tested by pediatricians and was found to be valid and reliable. Parents were asked to respond in a "yes" or "no" fashion to possible symptoms and health problems. The checklist was reworded to ask about re-occurring problems so as to target more long-term health problems for this study.

Demographic Instrumentation

Last, standard demographic questions were asked about parent's and child's gender, child's age, child's ethnicity, and parent marital status. This section also asked parents to describe the area they live as either "inner city," "urban," "suburban," or "rural" and to quantify the amount of time their children spend in outdoor activities. The demographic section was patterned after similar instruments (Dravinge et al., 2008; Waliczek et al., 1996), and was reviewed by other graduate students and researchers for face and content validity.

Data Collection and Analysis

Data were collected using the on-line survey. A link to the survey was posted on the Aggie Horticulture home web page between March and August 2009, which is accessed yearly by about 900,000 people (Texas A&M Horticulture Department, 2009) from around the world. An e-mail was also sent out to people who were potentially interested in completing the survey. The self-selected parents filled out the survey with compensation of a wildflower seed packet being sent in the mail to them after completion.

Participants accessed the survey from the link on the Aggie Horticulture web page (aggie-horticulture.tamu.edu) and then agreed to privacy and consent information and acknowledged that participation in the study was voluntary. Participants were then taken to the questionnaire, which took approximately 40 minutes to complete. After completing the questionnaire, respondents were given the option to include their mailing address so that the incentive could be sent. Personal information was removed from responses prior to the data being analyzed to ensure confidentiality.

Scoring

After the survey was available for five months, data were automatically downloaded into a Microsoft Excel™ file and then analyzed using the Statistical Package for the Social Sciences (SPSS®) Version 15.0 (Chicago, IL). Most statements on the two attitudinal sections of the questionnaire were coded so that a response of "strongly agree" gave 6 points, "somewhat agree" gave 5 points, "slightly agree" gave 4 points, "slightly disagree" gave 3 points, "somewhat disagree" gave 2 points and

"strongly disagree" gave 1 point. However, negatively worded statements were reverse coded so that an original response of 1 was reverse coded into a 6, 2 into a 5, 3 into a 4, 4 into a 3, 5 into a 2 and 6 into a 1. Examples of these types of questions included "walking in the woods is a waste of time," "there is too much crime for my child to play outside," and "playing outdoors is harmful to my child's school grades." The two attitudinal sections were scored by taking a cumulative sum of the responses.

The range of possible scores varied according to each section. In the Parents Attitude Toward Nature section scores had a possible range of 21 through 126. The section on Parental Attitude About Their Young Children Spending Time Outdoors had a possible range of 29 through 174. In each of these sections a higher score indicated a more positive attitude toward the variable, attitudes toward nature, or attitudes toward their children being outdoors, being measured.

The Health Problems section was also scored by taking a cumulative sum of the responses, with a response of "Yes" being worth 1 point and "No" equivalent to 0 points. The possible range of scores for the health section was 0 through 24, with a higher score indicating that more health problems were reported.

In the demographic survey section parents were asked to report the number of hours their children spent in various activities. These included outdoor free play, outdoor time in organized sports or activities, indoor time in organized sports or activities and indoor time playing video games or watching TV. Possible responses included "0-1 hours" which was coded as a 1, "1-2 hours" which was coded as a 2, and "2+hours" which was coded as a 3.

A Cronbach's reliable coefficient for each section of the survey was calculated to insure each measure had sufficient internal consistency. Statistical analysis included descriptive statistics, frequencies, correlations, and analysis of variance.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter will present, analyze and interpret the data collected in order to fulfill this study's purpose of investigating the relationship between attitudes of parents toward outdoor environments, and their children spending time outdoors, and how these attitudes relates to their children's overall health.

Objectives

1. To study parental attitude toward outdoor environments.
2. To study parental attitude about their children spending time outdoors.
3. To investigate the correlation between parental attitude toward outdoor environments and their attitude about their children spending time outdoors.
4. To study the relationship between the amount of time children spend playing outdoors vs. the amount of time they spend doing indoor activities and their overall health.
5. To examine the correlation between parental attitude toward outdoor environments, their attitude about their children spending time outdoors and the amount of time children spend in various activities.
6. To study the relationship between parental attitude about their children spending time outdoors and their children's overall health.
7. To determine parental preferences for play areas based on the natural and artificial elements of the setting.

The following hypotheses will be tested:

H1: Parents who have a positive attitude about nature will have a positive attitude about their children spending time outdoors.

H2: Children of parents who have a positive attitude about nature will spend more time outdoors.

H3: Children who spend more time outdoors will have fewer overall health problems.

H4: Parents will prefer settings which are neither completely natural nor completely artificial, but which have a mixture of elements.

Scale Reliability

Reliability of a scale means that when taken several times, a test or instrument will have consistent measurements. Or in other words, reliability is how consistent a test is in its measure (Gay and Airasian, 2003). If a test is more reliable then there is a better chance that the scores obtained from the test would be the same if it was re-administered to the same people again; if it was less reliable then the scores will be different (Gay and Airasian, 2003).

The reliability coefficient is an indication of how much the instrument measures permanent characteristics instead of transitory ones (Tuckman, 1999). Reliability scores range from 0.0 to 1.0. The closer the reliability score is to 1.0, the less error is present within the instrument. Therefore, a reliability score of 1.0 increases the likeliness that the differences observed measured permanent characteristics (Gall et al., 2006). To test the reliability of one test taken one time, internal consistency is a common form of

reliability (Gay and Airasian, 2003). To determine how all the items of an instrument relate to each other and to the overall instrument overall and thus estimate the internal consistency of an instrument, a Cronbach's alpha is used (Gay and Airasian, 2003). A Cronbach's reliability analysis of the Parent's Attitude About Nature Scale yielded a high reliability (α=0.87). The reliability analysis of the Parental Attitude About Their Children Playing Outdoors also yielded a high reliability of (α=0.87) (Gall, Borg and Gall, 2006).

Demographics

The target population for this study were adults with children aged 6 to 13. This age group was selected because it represented school-aged children who were not yet in high school. Responses were gathered from a total of 142 participants. Two respondents were not from the U.S., and their responses were removed for data analysis. Thus, 140 responses were used for the final data analysis.

Of those parents that responded, 22 (15.7%) were male and 118 (84.3%) were female. Of those who responded, 81 (57.9%) responded regarding their male children and 59 (42.1%) responded regarding their female children. When asked about marital status, 1 (0.7%) classified his/her self as "single/never married", 117 (83.6%) classified themselves as "married or partnered", 21 (15%) classified themselves as "divorced" and 1 (0.7%) classified his/her self as "widowed". Regarding ethnicity, 119 (85%) of the people who responded answered that they were "White," 11 (7.9%) answered that they were "Hispanic," 5 (3.6%) "African American," 1 (0.7%) "Native American" and 2 (1.4%) answered that they were "none of the above/other". When asked "Which of the

following most accurately describes the area in which you reside?" 40 (28.6%) people responded "rural," 81 (57.9%) responded "suburban," 14 (10%) responded "urban," 3 (2.1%) responded "inner city" and 2 (1.4%) people did not respond. When asked about their highest education level completed, 3 (2.1%) people responded that they have "less than high school" education, 12 (8.6%) responded that they were "high school graduates," 44 (31.4%) responded that they had completed "some college," 49 (35%) responded that they had a "four-year college degree," 30 (21.4%) responded that they had completed "graduate school" and 2 (1.4%) responded "other." Finally regarding income level, 1 (0.7%) person reported less than "$9,999", 2 (1.4%) people reported making between "$10,000 and $14,999," 5 (3.6%) people reported between "$15,000 and $24,999," 15 (10.7%) people reported between "$25,000 and $34,999," 23 (16.4%) people reported between "$35,000 and $49,999," 24 (17.1%) people reported between "$50,000 and $74,999," 22 (15.7%) reported between "$75,000 and $99,999," 30 (21.4%) people reported between "$100,000 and $149,999," and 14 (10%) people reported making more than "$150,000" with 4 (2.9%) people declining to answer (Table 1).

Table 1. Demographic analysis of the overall sample by gender of parent, gender of child, ethnicity, marital status, residential area, education level and income level in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Demographic Variable	n[z]	Attitude About Nature Mean Score[y]	Attitude About Children Spending Time Outdoors Mean Score[x]	Mean Number of Health Problems of Child Reported[w]
Gender of Parents				
Male	22	106.95	150.5	1.41
Female	118	109.82	151.73	1.74
Total	140			
P		0.275	0.943	0.602
Gender of Child				
Male	81	108.51	152.10	1.89
Female	59	110.56	150.76	1.41
Total	140			
P		0.606	0.881	0.287
Ethnicity				
White	119	109.51	152.53	1.71
Hispanic	11	107.09	143.73	1.27
African American	5	107.20	143.00	1.4
Native American	1	114.00	164.00	6
Asian	0	0	0	0
None of the Above	2	116.00	148.00	1
Total	138			
P		0.817	0.127	0.261
Marital Status				
Single/Never Married	1	104.00	134.00	5
Married/Partnered	117	108.95	152.09	1.7
Separated	0	0	0	0
Divorced	21	111.86	149.62	1.48
Widowed	1	112.00	144.00	1
Total	140			
P		0.842	0.74	0.301

Table 1 Continued

Demographic Variable	n[z]	Attitude About Nature Mean Score[y]	Attitude About Children Spending Time Outdoors Mean Score[x]	Mean Number of Health Problems of Child Reported[w]
Residential Area Type				
Rural	40	109.73	153.8.0	1.93
Suburban	81	108.44	151.15	1.72
Urban	14	113.00	149.00	1
Inner City	3	106.67	139.67	1.33
Total	138			
P		0.796	0.642	0.796
Education Level				
Less than High School	3	115.33	153.67	0
High School Grad	12	112.17	150.25	1.75
Some College	44	111.32	151.80	1.5
Four Year College Degree	49	108.12	152.12	1.8
Graduate School	30	107.20	151.77	2
Other	2	104.00	132.50	0.5
Total	140			
P		0.379	0.523	0.552
Income Level				
<9999	1	118.00	158.00	7.00
10k-14999	2	119.00	137.00	1.50
15k-24999	5	106.60	140.20	1.40
25k-34999	15	111.20	151.67	1.73
35k-49999	23	112.65	151.43	1.26
50k-74999	24	106.33	151.50	2.13
75k-99999	22	111.23	151.36	1.32
100k-149999	30	107.43	151.43	1.63
150k+	14	106.71	156.57	1.57
Total	136			
P		0.349	0.466	0.266

[z] Number of respondents for each category varied due to non-responses.
[y] Scores for Parental Attitude About Nature had a possible range of 21-126, and an actual range of 67 to 124
[x] Scores for Parental Attitude About Their Children Spending Time Outdoors had a possible range was 29-174, and an actual range of 98 to 173
[w] Health Problems scores had a possible range of 0-24, and an actual range of 0-8

Frequencies, t-tests and analysis of variance were run in SPSS® (version 15.0; SPSS, Chicago) to determine if gender of the respondent or child, ethnicity, marital status, residential area type, education level or income level had any effect on the respondents' scores on the research variables. No significant differences were found on any of the variables (Table 1). Therefore, parents in terms of demographics were considered to homogenous, and thus the data were not separated out into any demographic groups.

Findings Relating to Objective One

Objective one was to study parental attitudes about outdoor environments. Descriptive statistics were used to tabulate overall results including the mean score on the Parental Attitude About Nature Scale and the mean score on each individual question within the scale.

Instrument Scoring

Parental Attitude About Nature. Respondents were asked to rate 21 statements relating to their attitude toward nature and outdoor settings on a six-point Likert-type scale (Likert, 1967). Possible responses included "strongly agree," which scored 6 points, "somewhat agree" which scored 5 points, "slightly agree" which scored 4 points, "slightly disagree" which scored 3 points, "somewhat disagree" which scored 2 points, and "strongly disagree" which scored 1 point. Negatively worded statements were reverse coded such that the more positive response scored the higher points to allow for proper data analysis. Non-responses to any question received no points for that question.

Data Analysis. The respondents' Attitude About Nature Scale scores ranged from 67 to 124. The mean score for this scale was 109.37 with a standard deviation of 10.97. The mean score divided by the number of questions revealed a per question mean of 5.21. This indicated that most respondents answered most statements as either "somewhat agree" or "strongly agree" which suggested that parents' reported an overall positive view about nature (Table 2). These findings suggested that these parents enjoyed looking at, learning about nature and enjoyed being in outdoor settings. This is in accordance with other studies which have shown that people enjoy nature and natural settings (Chawla 2002; Frumkin, 2001; Korpela 2002). Specifically Maller et al., (2002) found that, for most people their favorite place tended to be in natural settings.

Table 2. Descriptive statistics indicating frequency of responses to questions on the Parental Attitude About Nature Scale in the study of the relationship between parents attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Statement	**Min.**	**Max.**	**Mean**	**Std. Deviation**
I really enjoy nature.	3	6	5.74	0.58
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	7	5.0		
Somewhat Agree	19	13.6		
Strongly Agree	113	80.7		
Total	140	100		

Table 2 Continued

Statement	Min.	Max.	Mean	Std. Deviation
It is wrong to use a lot of chemicals to kill weeds.	1	6	4.29	1.441
	Frequency	**Percent**		
Strongly Disagree	5	3.6		
Somewhat Disagree	15	10.7		
Slightly Disagree	20	14.3		
Slightly Agree	30	21.4		
Somewhat Agree	35	25.0		
Strongly Agree	35	25.0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I enjoy watching the sky on summer nights.	1	3	5.59	0.805
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	0	0		
Slightly Disagree	3	2.1		
Slightly Agree	9	6.4		
Somewhat Agree	26	18.6		
Strongly Agree	101	72.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I enjoy pictures of birds and animals.	2	6	5.29	0.931
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	1	0.7		
Slightly Disagree	5	3.6		
Slightly Agree	25	17.9		
Somewhat Agree	31	22.1		
Strongly Agree	78	55.7		
Total	140	100		

Table 2 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I like sitting beside a quiet pond.	3	6	5.43	0.832
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	5	3.6		
Slightly Agree	16	11.4		
Somewhat Agree	33	23.6		
Strongly Agree	86	61.4		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Walking in the woods is a waste of time. (r)[z]	3	6	5.75	0.613
	Frequency	**Percent**		
Strongly Disagree	115	82.1		
Somewhat Disagree	18	12.9		
Slightly Disagree	4	2.9		
Slightly Agree	3	2.1		
Somewhat Agree	0	0		
Strongly Agree	0	0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I wish I knew more about nature.	2	6	5.02	0.933
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	1	0.7		
Slightly Disagree	9	6.4		
Slightly Agree	26	18.6		
Somewhat Agree	54	38.6		
Strongly Agree	50	35.7		
Total	140	100		

Table 2 Continued

Statement	Min.	Max.	Mean	Std. Deviation
People should spend more time outside.	1	6	5.51	0.852
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	0	0		
Slightly Disagree	3	2.1		
Slightly Agree	14	10.0		
Somewhat Agree	26	18.6		
Strongly Agree	96	68.6		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I like TV programs about nature.	1	6	4.76	1.148
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	8	5.7		
Slightly Disagree	6	4.3		
Slightly Agree	36	25.7		
Somewhat Agree	46	32.9		
Strongly Agree	43	30.7		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Going on a hike is boring. (r)	1	6	5.39	1.097
	Frequency	**Percent**		
Strongly Disagree	94	67.1		
Somewhat Disagree	25	17.9		
Slightly Disagree	11	7.9		
Slightly Agree	4	2.9		
Somewhat Agree	4	2.9		
Strongly Agree	2	1.4		
Total	140	100		

Table 2 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I would like to get up early just to see the sun rise.	1	6	4.42	1.527
	Frequency	**Percent**		
Strongly Disagree	10	7.1		
Somewhat Disagree	7	5.0		
Slightly Disagree	18	12.9		
Slightly Agree	30	21.4		
Somewhat Agree	29	20.7		
Strongly Agree	46	32.9		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I would like to vacation in a cabin in the woods.	2	6	5.41	0.898
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	2	1.4		
Slightly Disagree	5	3.6		
Slightly Agree	12	8.6		
Somewhat Agree	35	25.0		
Strongly Agree	86	61.4		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I feel good when I am close to nature.	3	6	5.55	0.733
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	2	1.4		
Slightly Agree	14	10.0		
Somewhat Agree	29	20.7		
Strongly Agree	95	67.9		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I prefer an indoor job. (r)	1	6	3.51	1.471
	Frequency	**Percent**		
Strongly Disagree	15	10.7		
Somewhat Disagree	25	17.9		
Slightly Disagree	26	18.6		
Slightly Agree	39	27.9		

Table 2 Continued

	Min.	Max.	Mean	Std. Deviation
Somewhat Agree	21	15.0		
Strongly Agree	14	10.0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I like the smell of a lawn just after it has been cut.	1	6	5.24	1.064
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	4	2.9		
Slightly Disagree	4	2.9		
Slightly Agree	20	14.3		
Somewhat Agree	34	24.3		
Strongly Agree	77	55.0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I like the sounds that a stream makes.	3	6	5.79	0.52
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	4	2.9		
Somewhat Agree	19	13.6		
Strongly Agree	116	82.9		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I like walking through the leaves in the fall.	1	6	5.49	0.877
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	1	0.7		
Slightly Disagree	3	2.1		
Slightly Agree	11	7.9		
Somewhat Agree	31	22.1		
Strongly Agree	93	66.4		
Total	140	100		

Table 2 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I prefer family vacations where I spend most of my time indoors. (r)	1	6	5.04	1.196
	Frequency	**Percent**		
Strongly Disagree	62	44.3		
Somewhat Disagree	45	32.1		
Slightly Disagree	20	14.3		
Slightly Agree	7	5.0		
Somewhat Agree	1	0.7		
Strongly Agree	5	3.6		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Spending time outdoors is an enjoyable alternative to watching TV.	1	6	5.46	0.835
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	1	0.7		
Slightly Disagree	3	2.1		
Slightly Agree	6	4.3		
Somewhat Agree	45	32.1		
Strongly Agree	84	60.0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Family vacations are a good opportunity to spend time outdoors.	3	6	5.56	0.671
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	11	7.9		
Somewhat Agree	37	26.4		
Strongly Agree	91	65.0		
Total	140	100		

Table 2 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I enjoy eating meals outdoors.	2	6	5.13	1.031
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	5	3.6		
Slightly Disagree	6	4.3		
Slightly Agree	18	12.9		
Somewhat Agree	48	34.3		
Strongly Agree	63	45.0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Attitude About Nature Total	67	124	109.37	10.968

[z]Notation of (r) next to any statement indicates that statement was reverse coded for actual data analysis.

Findings Relating to Objective Two

Objective two was to study parental attitude about their children spending time outdoors. Descriptive statistics were used to tabulate overall results including the mean score on the Parental Attitude About Their Children Spending Time Outdoors Scale and the mean score on each individual question within the scale.

Instrument Scoring

Parental Attitude About Their Children Spending Time Outdoors Instrumentation. Respondents were asked to rate 29 statements relating to their attitude toward their children spending time outdoors on a six-point Likert-type scale (Likert, 1967). Possible responses included “strongly agree,” which scored 6 points, “somewhat agree” which scored 5 points, “slightly agree” which scored 4 points, “slightly disagree”

which scored 3 points, "somewhat disagree" which scored 2 points, and "strongly disagree" which scored 1 point. Negatively worded statements were reverse coded such that the more positive response scored the higher points to allow for proper data analysis. Non-responses to any question received no points for that question.

Data Analysis. The respondents' Attitude About Their Children Spending Time Outdoors Scale scores ranged from 98 to 173. The mean score for this scale was 151.54 with a standard deviation of 13.57. The mean score divided by the number of questions revealed a per question mean of 5.23. This indicated that most respondents answered most statements as either "somewhat agree" or "strongly agree" which suggested that parents reported an overall positive view about their children spending time outdoors (Table 3). These findings indicate that despite possible dangers that their children may encounter outdoors, parents in this sample still were positive about their children spending time outdoors. Studies have shown that safety factors can influence parents as to where they let their children play, and concerns related to traffic, abduction, gangs and violent strangers may persuade parents that the outdoor environment is not a good place in which they should allow their children to play in (Farley et al., 2007; Molnar el al., 2004; Valentine and McKendrick, 1997; Veitch et al., 2006). However, in this study, these concerns did not appear to be an overriding factor in whether or not parents felt good about letting their children play outdoors.

Table 3. Descriptive statistics indicating frequency of responses to questions on the Parental Attitude About Their Children Spending Time Outdoors Scale in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Statement	Min.	Max.	Mean	Std. Deviation
Playing outside encourages too much aggressive behavior. (r)[z]	1	6	5.76	0.688
	Frequency	**Percent**		
Strongly Disagree	119	85.0		
Somewhat Disagree	12	8.6		
Slightly Disagree	7	5.0		
Slightly Agree	1	0.7		
Somewhat Agree	1	0.7		
Strongly Agree	0	0		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
All playgrounds should contain natural elements.	1	6	4.99	1.261
	Frequency	**Percent**		
Strongly Disagree	2	1.4		
Somewhat Disagree	5	3.6		
Slightly Disagree	10	7.1		
Slightly Agree	31	22.1		
Somewhat Agree	19	13.6		
Strongly Agree	73	52.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Playing outside would be good for my child's health.	1	6	5.79	0.651
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	1	0.7		
Slightly Disagree	0	0		
Slightly Agree	5	3.6		
Somewhat Agree	11	7.9		
Strongly Agree	122	87.1		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
There is too much crime for my child to play outside. (r)	1	6	4.83	1.383
	Frequency	**Percent**		
Strongly Disagree	64	45.7		
Somewhat Disagree	29	20.7		
Slightly Disagree	21	15.0		
Slightly Agree	14	10.0		
Somewhat Agree	9	6.4		
Strongly Agree	3	2.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I think my child should go on nature hikes.	3	6	5.54	0.772
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	4	2.9		
Slightly Agree	12	8.6		
Somewhat Agree	29	20.7		
Strongly Agree	95	67.9		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Playing outside is a wasteful way for children to spend their free time. (r)	1	6	5.84	0.653
	Frequency	**Percent**		
Strongly Disagree	128	91.4		
Somewhat Disagree	6	4.3		
Slightly Disagree	4	2.9		
Slightly Agree	0	0		
Somewhat Agree	1	0.7		
Strongly Agree	1	0.7		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
My neighborhood is safe enough for children to play outside.	1	6	5.11	1.155
	Frequency	**Percent**		
Strongly Disagree	2	1.4		
Somewhat Disagree	5	3.6		
Slightly Disagree	7	5.0		
Slightly Agree	15	10.7		
Somewhat Agree	44	31.4		
Strongly Agree	67	47.9		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I would let my child walk in the rain even if they got wet.	1	6	5.37	0.939
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	1	0.7		
Slightly Disagree	6	4.3		
Slightly Agree	11	7.9		
Somewhat Agree	39	27.9		
Strongly Agree	82	58.6		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
My child gets too dirty to play outside. (r)	1	6	5.21	1.261
	Frequency	**Percent**		
Strongly Disagree	84	60		
Somewhat Disagree	29	20.7		
Slightly Disagree	11	7.9		
Slightly Agree	8	5.7		
Somewhat Agree	4	2.9		
Strongly Agree	4	2.9		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I am afraid my child may be harmed by strangers outside. (r)	1	6	3.68	1.509
	Frequency	**Percent**		
Strongly Disagree	22	15.7		
Somewhat Disagree	25	17.9		
Slightly Disagree	21	15.0		
Slightly Agree	40	28.6		
Somewhat Agree	22	15.7		
Strongly Agree	10	7.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Spending time outdoors is a meaningful family activity.	1	6	5.73	0.687
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	0	0		
Slightly Disagree	2	1.4		
Slightly Agree	3	2.1		
Somewhat Agree	21	15.0		
Strongly Agree	113	80.7		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I worry that my child will be hurt by gangs if he/she plays outside. (r)	2	6	5.22	1.194
	Frequency	**Percent**		
Strongly Disagree	87	62.1		
Somewhat Disagree	21	15.0		
Slightly Disagree	15	10.7		
Slightly Agree	10	7.1		
Somewhat Agree	7	5.0		
Strongly Agree	0	0		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
My child's learning can be stimulated by outdoor play.	3	6	5.71	0.579
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	6	4.3		
Somewhat Agree	25	17.9		
Strongly Agree	108	77.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Playing outdoors hurts my child's school grades. (r)	1	6	5.71	0.807
	Frequency	**Percent**		
Strongly Disagree	119	85.0		
Somewhat Disagree	10	7.1		
Slightly Disagree	6	4.3		
Slightly Agree	3	2.1		
Somewhat Agree	1	0.7		
Strongly Agree	1	0.7		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Playing outdoors is a good way to improve hand-eye coordination.	3	6	5.63	0.65
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	10	7.1		
Somewhat Agree	29	20.7		
Strongly Agree	100	71.4		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
Other children in my neighborhood are safe for my child to play around.	1	6	5.11	1.046
	Frequency	**Percent**		
Strongly Disagree	2	1.4		
Somewhat Disagree	2	1.4		
Slightly Disagree	6	4.3		
Slightly Agree	19	13.6		
Somewhat Agree	50	35.7		
Strongly Agree	61	43.6		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Road safety is a concern for children in my neighborhood. (r)	1	6	3.04	1.538
	Frequency	**Percent**		
Strongly Disagree	11	7.9		
Somewhat Disagree	19	13.6		
Slightly Disagree	17	12.1		
Slightly Agree	37	26.4		
Somewhat Agree	29	20.7		
Strongly Agree	27	19.3		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Children who play outdoors gain confidence.	3	6	5.44	0.779
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	2	1.4		
Slightly Agree	19	13.6		
Somewhat Agree	35	25.0		
Strongly Agree	84	60.0		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I allow my child to have a wide range of recreational outdoor activities from which to choose.	2	6	5.22	0.997
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	2	1.4		
Slightly Disagree	7	5.0		
Slightly Agree	24	17.1		
Somewhat Agree	32	22.9		
Strongly Agree	75	53.6		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I feel that outdoor play interferes too much with my child's homework time. (r)	1	6	5.21	1.116
	Frequency	**Percent**		
Strongly Disagree	78	55.7		
Somewhat Disagree	32	22.9		
Slightly Disagree	16	11.4		
Slightly Agree	11	7.9		
Somewhat Agree	1	0.7		
Strongly Agree	2	1.4		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
My child is easier to manage after spending time outside.	2	6	4.92	1.073
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	4	2.9		
Slightly Disagree	11	7.9		
Slightly Agree	29	20.7		
Somewhat Agree	44	31.4		
Strongly Agree	52	37.1		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
I am afraid my child may be abducted outdoors. (r)	1	6	4.14	1.486
	Frequency	**Percent**		
Strongly Disagree	38	27.1		
Somewhat Disagree	25	17.9		
Slightly Disagree	18	12.9		
Slightly Agree	41	29.3		
Somewhat Agree	14	10.0		
Strongly Agree	4	2.9		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I let my child make mud pies.	1	6	5.14	1.191
	Frequency	**Percent**		
Strongly Disagree	3	2.1		
Somewhat Disagree	2	1.4		
Slightly Disagree	10	7.1		
Slightly Agree	18	12.9		
Somewhat Agree	31	22.1		
Strongly Agree	76	54.3		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Taking part in outdoor recreation improves my child's communication skills.	3	6	5.13	0.912
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	5	3.6		
Slightly Agree	35	25.0		
Somewhat Agree	37	26.4		
Strongly Agree	63	45.0		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
Outdoor activities overstimulate my child. (r)	1	6	5.37	1.082
	Frequency	**Percent**		
Strongly Disagree	90	64.3		
Somewhat Disagree	29	20.7		
Slightly Disagree	11	7.9		
Slightly Agree	6	4.3		
Somewhat Agree	1	0.7		
Strongly Agree	3	2.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Taking part in outdoor activities helps to build up my child's level of independence.	3	6	5.56	0.702
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	14	10.0		
Somewhat Agree	31	22.1		
Strongly Agree	94	67.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
I would let my child play in a sand box.	1	6	5.59	0.928
	Frequency	**Percent**		
Strongly Disagree	2	1.4		
Somewhat Disagree	1	0.7		
Slightly Disagree	3	2.1		
Slightly Agree	8	5.7		
Somewhat Agree	18	12.9		
Strongly Agree	108	77.1		
Total	140	100		

Table 3 Continued

Statement	Min.	Max.	Mean	Std. Deviation
Outdoor activities are a good way for my child to make friends.	3	6	5.66	0.595
	Frequency	**Percent**		
Strongly Disagree	0	0		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	6	4.3		
Somewhat Agree	32	22.9		
Strongly Agree	101	72.1		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Participating in outdoor play is a good way for my child to get exercise.	1	6	5.89	0.551
	Frequency	**Percent**		
Strongly Disagree	1	0.7		
Somewhat Disagree	0	0		
Slightly Disagree	1	0.7		
Slightly Agree	1	0.7		
Somewhat Agree	6	4.3		
Strongly Agree	131	93.6		
Total	140	100		
	Min.	**Max.**	**Mean**	**Std. Deviation**
Attitude About Children Spending Time Outdoors Total	98	173	151.54	13.573

[z]Notation of (r) next to any statement indicates that statement was reverse coded for actual data analysis.

Findings Relating to Objective Three

Objective three was to investigate the correlation between parental attitude toward outdoor environments and their attitude about their children spending time outdoors.

Data Analysis. A Pearson's product-moment correlation was run between respondents' Attitude About Nature score and their Attitude About Their Children Spending Time Outdoors score. A correlation determines the degree of relationship between two variables. Correlation coefficients range from -1.00 to +1.00. Strong correlations indicate that one variable helps predict the respondents score on another variable (Coolidge, 2006). Statistically significant correlations were found between the two scales (P=0.001) (Table 4). This finding is in accordance with the first hypothesis and revealed that within this sample of parents, those who had a positive attitude about nature also had a positive attitude about their children spending time outdoors in nature.

Table 4. Correlation matrix indicating the Pearson's product-moment correlation between Parental Attitude About Their Children Spending Time Outdoors scores[z] and Parental Attitude About Nature scores[y] in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Scale		Attitude About Children Spending Time Outdoors
Attitude About Nature Total	Pearson Correlation	0.572
	P	0.001*
	N	140

*Statistically significant at the 0.05 level

[z] Scores for Parental Attitude About Their Children Spending Time Outdoors had a possible of 29-174 and an actual range of 98-173. Higher Parental Attitude About Their Children Spending Time Outdoors scores indicated a positive view of their children spending time outdoors, lower scores indicated more negative view.

[y] Scores for Parental Attitude About Nature had a possible range of 21-126 and an actual range of 67-124. Higher Parental Attitude about Nature score indicated a positive view about nature; lower scores indicated a more negative view.

This correlation indicated a strong positive relationship between the two scales (r=+0.57) (Coolidge, 2006). This revealed that as respondents' scores on the Attitude About Nature Scale increased their scores on the Attitude About Their Children Spending Time Outdoors Scale also increased. Beets et al., (2007) found that parents who spent more time in outdoor recreation also reported their children spending more time outdoors.

Findings Relating to Objective Four

Objective four was to study the relationship between the amount of time children spend playing outdoors vs. the amount of time they spend doing indoor activities and their overall health.

Instrument Scoring

Time Spent in Various Activities. Parents were asked to quantify the number of hours their children spent in outdoor free play, outdoor organized activities or sports, indoor organized activities or sports, and video game indoor playing or watching TV per day. Possible responses included "0-1 hours" which scored 1 point, "1-2 hours" which scored 2 points, and "2+ hours" which scored 3 points. Therefore, the more hours reported for each activity, the more points scored on that question.

Data Analysis. A Pearson's product-moment correlation was run between the combined time spent indoor scores; the combined time spent outdoor scores and health problems. The combined outdoor time scores was a combination of the time spent in outdoor free play and the time spent outdoors in organized sports and activities. The combined indoor time scores were taken from a combination of the scores from the time

children spent indoor playing video games or watching TV and the time children spent indoors in organized activities and sports.

Statistically significant correlations were found. Total time spent outdoors was negatively statistically significantly correlated with health problems. Specifically, feeling tired or having low energy (r=-0.229, *P*=0.007), and trouble sleeping (*r*=-0.186, *P*=0.028) were negatively correlated with total outdoor time (Table 5). This indicated that as children's outdoor time score increased, parental reports of having low energy or feeling tired and having trouble sleeping decreased. Several studies have reported children being energetic and physically active when exposed to outdoor areas (Farley et al., 2007; Fjortoft, 2004).

The total time spent indoor score was positively correlated with the Health Problems score (*r*=+0.197, *P*=0.02), nasal congestion (*r*=+0.221, *P*=0.009), asthma attacks (*r*=+0.173, *P*=0.041), trouble sleeping (*r*=+0.171, *P*=0.044), diabetes (*r*=+0.186, *P*=0.027), and frequent swollen glands (*r*=+0.175, *P*=0.039) (Table 5). This indicated that as the children's reported number of total hours spent indoors increased, the overall number of health problems reported increased. Also, reports of specific health problems increased, which included nasal congestion, asthma attacks, trouble sleeping, diabetes and frequent swollen glands.

Coon et al., (2001) also found that children who spent more time indoors tended to have poorer health. Habits, such as children spending more time sitting in front of the TV or playing video games, have decreased amount of physical activity and increased exposure to indoor allergens causing an increase in asthma development (Ring et al.,

2001). In addition, factors relating to diabetes have been linked to the amount of time spent indoors. Florez et al. (2007) found that vitamin D deficiency increased susceptibility for problems such as diabetes, and that people who exercised outdoors were 47% less likely to be vitamin D deficient. Obesity also increased the risk of diabetes, and negative dietary and exercise habits were associated with increased TV viewing (Burdette et al., 2004; Dennison et al., 2002; Proctor et al., 2003; Sallis et al., 1993).

Table 5. Correlation matrix indicating the Pearson's product-moment correlation between the overall time spent indoors score[z], the overall time spent outdoor score[y] and health problems[x] in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Health		Total Indoor Score	Total Outdoor Time Score
Health Problems	Pearson Correlation	0.197*	-0.032
	P	0.02	0.703
	N	140	140
Nasal congestion	Pearson Correlation	0.221*	0.127
	P	0.009	0.136
	N	140	140
Itchy or watery eyes	Pearson Correlation	0.025	-0.075
	P	0.767	0.381
	N	140	140
Ear infection or ear ache	Pearson Correlation	-0.101	0.116
	P	0.0237	0.173
	N	140	140
Asthma attacks	Pearson Correlation	0.173*	0.077
	P	0.041	0.364
	N	140	140
Cough	Pearson Correlation	0.074	0.096
	P	0.384	0.261
	N	140	140

Table 5 Continued

Health		Total Indoor Score	Total Outdoor Time Score
Headache	Pearson Correlation	0.127	-0.075
	P	0.136	0.376
	N	140	140
Colds	Pearson Correlation	0.031	0.068
	P	0.72	0.422
	N	140	140
Sore throat	Pearson Correlation	0.161	0.068
	P	0.057	0.422
	N	140	140
Body pain or discomfort	Pearson Correlation	0.061	-0.131
	P	0.476	0.122
	N	140	140
Constipation loose bowels or diarrhea	Pearson Correlation	0.037	-0.085
	P	0.666	0.316
	N	140	140
Trouble sleeping	Pearson Correlation	0.171*	-0.186*
	P	0.044	0.028
	N	140	140
Limitations riding a bike, running, or playing sports	Pearson Correlation	0.039	-0.115
	P	0.646	0.177
	N	140	140
Repeated upset stomach	Pearson Correlation	0.042	-0.150
	P	0.621	0.077
	N	140	140
Nervousness	Pearson Correlation	0.003	-0.072
	P	0.974	0.401
	N	140	140
Feeling tired or having low energy	Pearson Correlation	0.082	-0.229*
	P	0.338	0.007
	N	140	140
Overweight/Obesity	Pearson Correlation	0.042	-0.032
	P	0.621	0.705
	N	140	140
Chest pain	Pearson Correlation	0.134	0.024
	P	0.114	0.781
	N	140	140
Loss of appetite	Pearson Correlation	-0.121	-0.106
	P	0.153	0.212
	N	140	140

Table 5 Continued

Health		Total Indoor Score	Total Outdoor Time Score
Diabetes	Pearson Correlation	0.186*	0.017
	P	0.027	0.845
	N	140	140
Frequent swollen glands	Pearson Correlation	0.175*	0.055
	P	0.039	0.518
	N	140	140
Back pain	Pearson Correlation	0.088	-0.032
	P	0.301	0.711
	N	140	140
Dizziness	Pearson Correlation	0.000	0.000
	P	0.000	0.000
	N	140	140
Weight loss of 10lbs or more	Pearson Correlation	0.000	0.000
	P	0.000	0.000
	N	140	140
Eating disorders	Pearson Correlation	0.000	0.000
	P	0.000	0.000
	N	140	140

*Statistically significant at the 0.05 level.
[x]Overall time spent outdoors score was the total score from outdoor free play and outdoor organized activity and sports.
[w]Overall time spent indoors score was the total score from indoor time spent playing video games and watching TV and indoor organized activity and sports.
[x]Health Problems scores had a possible range of 0-24, and an actual range of 0-8.

Instrument Scoring

Health Problems. Parents were asked to indicate whether their child experienced reoccurring problems with a list of health symptoms. Possible responses included either "Yes" or "No," with a response of "Yes" scoring 1 points and a response of "No" scoring 0 points. Therefore the higher the Health Problems score, the more reoccurring health problems reported (Table 6).

Table 6. Descriptive statistics indicating frequency of responses to health problems in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Health Problem		
	Frequency	**Percent**
Nasal congestion	39	27.90
Itchy or watery eyes	34	24.30
Ear infection or ear ache	29	20.70
Asthma attacks	20	14.30
Cough	16	11.40
Headache	14	10.00
Colds	12	8.60
Sore throat	12	8.60
Body pain or discomfort	10	7.10
Constipation loose bowels or diarrhea	7	5.00
Trouble sleeping	7	5.00
Limitations riding a bike, running, or playing sports	6	4.30
Repeated upset stomach	5	3.60
Nervousness	5	3.60
Feeling tired or having low energy	5	3.60
Overweight/Obesity	5	3.60
Chest pain	4	2.90
Loss of appetite	2	1.40
Diabetes	2	1.40
Frequent swollen glands	1	0.70
Back pain	1	0.70
Dizziness	0	0.00
Weight loss of 10lbs or more	0	0.00
Eating disorders	0	0.00
Total	**236**	

Data Analysis. For the question "How many hours per day does your child spend outdoors in free play on average" 31 (22.1%) people answered "0-1 hours", 70 (50.0%) people answered "1-2 hours" and 39 (27.9%) people answered "2+ hours". Within the "0-1" hour group, the scores on the individual health problems ranged from 0-7. In the

"1-2" hour group, the scores in the individual health problems ranged from 0-21, and in the "2+" hours group, the individual health problem scores ranged from 0-12.

For the question "How many hours per day does your child spend outdoors in organized activities or sports on average," 104 (74.3%) people answered "0-1" hours, 29 (20.7%) answered "1-2" hours, and 7 (5.0%) people answered "2+" hours. Within the "0-1" hour group, the scores on the individual health problems ranged from 0-25. Within the "1-2" hour group, the scores for the individual health problems ranged from 0-15, and in the "2+" hours group, the scores ranged from 0-1.

For the question "How much time per day does your child spend indoors in organized activities or sports" 107 (76.4%) people answered "0-1" hours, 19 (13.6%) answered "1-2" hours and 13 (9.3%) answered "2+" hours. In the "0-1" hour group the scores for the individual health problems ranged from 0-26, in the "1-2" hour group the scores ranged from 0-11. Finally in the "2+" hours group the scores for the individual health problems ranged from 0-5.

Lastly, for the question, "How much time per day does your child spend indoors on video games or watching TV?" 68 (48.6%) people answered "0-1" hours, 50 (35.7%) answered "1-2" hours and 22 (15.7%) answered "2+" hours. In the "0-1" hour group, the scores for the individual health problems ranged from 0-15. In the "1-2" hour group, the scores for the individual health problems ranged from 0-15. Finally in the "2+" hours group, the scores for the individual health problems ranged from 0-10 (Table 7).

Table 7. Descriptive statistics indicating frequency of responses to health problems sorted by response to hours spent in each activity in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health

Time Spent In Activity	0-1 Hours		1-2 Hours		2+ Hours	
Outdoor Free Play	**n=31**		**n=70**		**n=39**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Nasal congestion	7	22.6	20	28.6	12	30.8
Itchy or watery eyes	7	22.6	21	30.0	6	15.4
Ear infection or ear ache	4	12.9	14	20.0	11	28.2
Asthma attacks	5	16.1	10	14.3	5	12.8
Cough	2	6.5	9	12.9	5	12.8
Headache	5	16.1	8	11.4	1	2.6
Colds	2	6.5	6	8.6	4	10.3
Sore throat	2	6.5	5	7.1	5	12.8
Body pain or discomfort	6	19.4	3	4.3	1	2.6
Constipation loose bowels or diarrhea	3	9.7	3	4.3	1	2.6
Trouble sleeping	4	12.9	2	2.9	1	2.6
Limitations riding a bike, running, or playing sports	4	12.9	0	0	2	5.1
Repeated upset stomach	3	9.7	2	2.9	0	0
Nervousness	1	3.2	3	4.3	1	2.6
Feeling tired or having low energy	5	16.1	0	0	0	0

Table 7 Continued

Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Outdoor Free Play	**n=31**		**n=70**		**n=39**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Overweight/ Obesity	1	3.2	3	4.3	1	2.6
Chest pain	2	6.5	1	1.4	1	2.6
Loss of appetite	1	3.2	1	1.4	0	0
Diabetes	0	0	1	1.4	1	2.6
Frequent swollen glands	1	3.2	0	0	0	0
Back pain	1	3.2	0	0	0	0
Dizziness	0	0	0	0	0	0
Weight loss of 10lbs or more	0	0	0	0	0	0
Eating disorders	0	0	0	0	0	0
Total	**66**		**112**		**58**	
Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Outdoor Organized Activities Or Sports	**n=104**		**n=29**		**n=7**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Nasal congestion	23	22.1	15	51.7	1	14.3
Itchy or watery eyes	25	24.0	9	31.0	0	0
Ear infection or ear ache	21	20.2	6	20.7	2	28.6
Asthma attacks	10	9.6	9	31	1	14.3
Cough	10	9.6	5	17.2	1	14.3
Headache	9	8.7	4	13.8	1	14.3
Colds	8	7.7	3	10.3	1	14.3
Sore throat	8	7.7	4	13.8	0	0

Table 7 Continued

Time Spent In Activity	0-1 Hours		1-2 Hours		2+ Hours	
Outdoor Organized Activities Or Sports	**n=104**		**n=29**		**n=7**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Body pain or discomfort	7	6.7	2	6.9	1	14.3
Constipation loose bowels or diarrhea	5	4.8	2	6.9	0	0
Trouble sleeping	7	6.7	0	0	0	0
Limitations riding a bike, running, or playing sports	5	4.8	1	3.4	0	0
Repeated upset stomach	4	3.8	1	3.4	0	0
Nervousness	5	4.8	0	0	0	0
Feeling tired or having low energy	4	3.8	1	3.4	0	0
Overweight/Obesity	4	3.8	1	3.4	0	0
Chest pain	2	1.9	1	3.4	1	14.3
Loss of appetite	2	1.9	0	0	0	0
Diabetes	2	1.9	0	0	0	0
Frequent swollen glands	0	0	0	0	1	14.3
Back pain	0	0	1	3.4	0	0
Dizziness	0	0	0	0	0	0
Weight loss of 10lbs or more	0	0	0	0	0	0
Eating disorders	0	0	0	0	0	0
Total	**161**		**65**		**10**	

Table 7 Continued

Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Indoors Organized Activities Or Sports	**n=107**		**n=19**		**n=13**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Nasal congestion	25	23.4	8	42.1	5	38.5
Itchy or watery eyes	26	24.3	5	26.3	2	15.4
Ear infection or ear ache	23	21.5	6	31.6	0	0
Asthma attacks	7	6.5	11	57.9	2	15.4
Cough	9	8.4	4	21.1	3	23.1
Headache	10	9.3	3	15.8	1	7.7
Colds	8	7.5	4	21.1	0	0
Sore throat	7	6.5	4	21.1	1	7.7
Body pain or discomfort	8	7.5	2	10.5	0	0
Constipation loose bowels or diarrhea	5	4.7	1	5.3	1	7.7
Trouble sleeping	5	4.7	2	10.5	0	0
Limitations riding a bike, running, or playing sports	5	4.7	1	5.3	0	0
Repeated upset stomach	4	3.7	1	5.3	0	0
Nervousness	3	2.8	2	10.5	0	0
Feeling tired or having low energy	4	3.7	1	5.3	0	0
Overweight/ Obesity	4	3.7	1	5.3	0	0
Chest pain	2	1.9	1	5.3	1	7.7

Table 7 Continued

Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Indoors Organized Activities Or Sports	**n=107**		**n=19**		**n=13**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Loss of appetite	2	1.9	0	0	0	0
Diabetes	1	0.9	0	0	1	7.7
Frequent swollen glands	0	0	1	5.3	0	0
Back pain	0	0	1	5.3	0	0
Dizziness	0	0	0	0	0	0
Weight loss of 10lbs or more	0	0	0	0	0	0
Eating disorders	0	0	0	0	0	0
Total	**158**		**59**		**17**	
Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Indoor Videos Games Or Watching TV	**n=68**		**n=50**		**n=22**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Nasal congestion	14	20.6	15	30.0	10	45.5
Itchy or watery eyes	14	20.6	13	26.0	7	31.8
Ear infection or ear ache	15	22.1	11	22.0	3	13.6
Asthma attacks	9	13.2	9	18.0	2	9.1
Cough	9	13.2	5	10.0	2	9.1
Headache	4	5.9	6	12.0	4	18.2
Colds	6	8.8	3	6.0	3	13.6
Sore throat	3	4.4	6	12.0	3	13.6

Table 7 Continued

Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Indoor Videos Games Or Watching TV	**n=68**		**n=50**		**n=22**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Body pain or discomfort	4	5.9	2	4.0	4	18.2
Constipation loose bowels or diarrhea	4	5.9	1	2.0	2	9.1
Trouble sleeping	1	1.5	2	4.0	4	18.2
Limitations riding a bike, running, or playing sports	1	1.5	4	8.0	1	4.5
Repeated upset stomach	1	1.5	3	6.0	1	4.5
Nervousness	3	4.4	1	2.0	1	4.5
Feeling tired or having low energy	1	1.5	2	4.0	2	9.1
Overweight/ Obesity	2	2.9	1	2.0	2	9.1
Chest pain	1	1.5	2	4.0	1	4.5
Loss of appetite	2	2.9	0	0	0	0
Diabetes	0	0	1	2.0	1	4.5
Frequent swollen glands	0	0	0	0	1	4.5
Back pain	0	0	1	2.0	0	0
Dizziness	0	0	0	0	0	0
Weight loss of 10lbs or more	0	0	0	0	0	0

Table 7 Continued

Time Spent In Activity	**0-1 Hours**		**1-2 Hours**		**2+ Hours**	
Indoor Videos Games Or Watching TV	**n=68**		**n=50**		**n=22**	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Eating disorders	0	0	0	0	0	0
Total	**94**		**88**		**54**	

A Pearson's product-moment correlation was calculated between respondents' reports of the time their children spent in various activities scores and their reports of their children's Health Problems scores. Only one statistically significant correlation was found: "How much time per day does your child spend indoors on video games or watching TV?" was statistically significantly correlated with the Health Problems score (r=+0.182, P=0.031). This indicated a weak positive relationship between the two scores (Coolidge, 2006). This revealed that as respondents' reports of the time their children spent indoors playing video games and watching TV increased, then their reports of the number of health problems their children experienced also increased

This finding corroborates with other studies which showed unhealthy effects from watching TV (Blass et al., 2006; Coon et al., 2001). Specifically TV viewing was linked to higher BMI, decreased heavy physical activity and weaker cardio-respiratory fitness (Pettee et al., 2008). This may indicate that just getting children away from the TV and doing something else can help improve their health.

There was also a trend, though not statistically significant, for health problems to decrease based on the number of hours children spent outdoors. For example, Ludvigsson et al., (2007) found that children who spent more time playing outdoors were more physically active and tended to have a lower BMI.

Pearson's product-moment correlations were also run between respondents' reports of time their children spent in various activities and their reports of their children's individual health problems. Statistically significant correlations were found between several activities and health problems. Scores for "How many hours per day does your child spend outdoors in free play on average?" was negatively statistically significantly correlated with body pain or discomfort (r=-0.219, P=0.009), repeated upset stomach (r=-0.179, P=0.034), and feeling tired or having low energy (r=-0.289, P=0.001). This indicates that as respondents' reports of their children spending time outdoors in free play increased, their reports of their children experiencing body pain or discomfort, repeated upset stomach or feeling tired or having low energy decreased (Table 8). Watanabe et al., (2006) also found that outdoor play could be associated with preventing different illnesses in children.

Scores for the question "How many hours per day does your child spend outdoors in organized activities or sports on average?" was positively statistically significantly correlated with asthma attacks (r=+0.177, P=0.036), and frequent swollen glands (r=+0.257, P=0.002). This shows that as respondents' reports of their children spending time outdoors in organized activities or sports increased, their reports of their

children experiencing asthma attacks or frequent swollen glands also increased (Table 8).

Scores for the question "How much time per day does your child spend indoors in organized activities or sports" was positively statistically significantly correlated with asthma attacks (r=+0.274, P=0.001) and cough (r=+0.171, P=0.045). This shows that as respondents' reports of their children spending time indoors in organized activities or sports increased, their reports of their children experiencing asthma attacks or cough also increased (Table 8).

It was interesting that the time spent in organized sports, regardless of whether it was outdoors or indoors was correlated with asthma attacks. This indicates that the more time a child spends in organized sports, regardless of if it occurs indoors or outdoors, the more likely they are to have asthma attacks. This is in concurrence with other research which has examined a link between sports, exercise and the occurrence of asthma (Billen and Dupont, 2009; Giacco et al., 2001). Specifically, Giacco et al., (2001) mentions exercise-induced asthma which is specifically triggered by high activity levels and is often seen during sports activity. Additionally, exercise-induced asthma is one of the main types of asthma seen in young children (Giacco et al., 2001).

Finally, the question, "How much time per day does your child spend indoors on videos games or watching TV?" was positively statistically significantly correlated with nasal congestion (r=+0.192, P=0.023), and trouble sleeping (r=+0.237, P=0.005). This shows that as respondents' reports of their children spending time indoors on video games or watching TV increased, their reports of their children experiencing nasal

congestion or trouble sleeping also increased (Table 8). In particular, the correlation with nasal congestion is interesting because of its occurrence as a symptom of allergies. In addition, allergies have been reported to cause sleep disturbances in children (Khan et al., 2001).

Table 8. Correlation matrix indicating the Pearson's product-moment correlation between outdoor free play score[z], outdoor organized activities or sports score[y], indoor organized activities or sports score[x] and indoor video games or watching TV score[w] and health problems[v] in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Health Problem		Outdoor Free Play	Outdoor Organized Activities Or Sports	Indoor Organized Activities Or Sports	Indoor Video Games Or Watching TV
Health Problems	Pearson Correlation	-0.108	0.079	0.096	0.182*
	P	0.204	0.351	0.259	0.031
	N	140	140	139	140
Nasal congestion	Pearson Correlation	0.063	0.143	0.144	0.192*
	P	0.462	0.092	0.090	0.023
	N	140	140	139	140
Itchy or watery eyes	Pearson Correlation	-0.07	-0.043	-0.045	0.095
	P	0.414	0.614	0.602	0.264
	N	140	140	139	140
Ear infection or ear ache	Pearson Correlation	0.134	0.034	-0.094	-0.060
	P	0.116	0.686	0.270	0.485
	N	140	140	139	140
Asthma attacks	Pearson Correlation	-0.033	.177*	.274*	-0.012
	P	0.698	0.036	0.001	0.888
	N	140	140	139	140

Table 8 Continued

Health Problem		Outdoor Free Play	Outdoor Organized Activities Or Sports	Indoor Organized Activities Or Sports	Indoor Video Games Or Watching TV
Cough	Pearson Correlation	0.066	0.084	.171*	-0.054
	P	0.435	0.325	0.045	0.530
	N	140	140	139	140
Headache	Pearson Correlation	-0.162	0.072	0.018	0.150
	P	0.056	0.395	0.838	0.077
	N	140	140	139	140
Colds	Pearson Correlation	0.048	0.060	0.005	0.033
	P	0.577	0.482	0.957	0.700
	N	140	140	139	140
Sore throat	Pearson Correlation	0.084	0.014	0.085	0.138
	P	0.325	0.866	0.320	0.105
	N	140	140	139	140
Body pain or discomfort	Pearson Correlation	-0.219*	0.046	-0.054	0.125
	P	0.009	0.589	0.527	0.142
	N	140	140	139	140
Constipation loose bowels or diarrhea	Pearson Correlation	-0.112	-0.009	0.038	0.013
	P	0.189	0.918	0.658	0.875
	N	140	140	139	140
Trouble sleeping	Pearson Correlation	-0.158	-0.126	-0.014	0.237*
	P	0.062	0.138	0.872	0.005
	N	140	140	139	140
Limitations riding a bike, running, or playing sports	Pearson Correlation	-0.117	-0.053	-0.052	0.095
	P	0.168	0.533	0.540	0.264
	N	140	140	139	140
Repeated upset stomach	Pearson Correlation	-0.179*	-0.037	-0.038	0.086
	P	0.034	0.665	0.661	0.310
	N	140	140	139	140

Table 8 Continued

Health Problem		Outdoor Free Play	Outdoor Organized Activities Or Sports	Indoor Organized Activities Or Sports	Indoor Video Games Or Watching TV
Nervousness	Pearson Correlation	-0.016	-0.106	0.023	-0.019
	P	0.855	0.214	0.787	0.826
	N	140	140	139	140
Feeling tired or having low energy	Pearson Correlation	-0.289*	-0.037	-0.038	0.139
	P	0.001	0.665	0.661	0.101
	N	140	140	139	140
Overweight/Obesity	Pearson Correlation	-0.016	-0.037	-0.038	0.086
	P	0.855	0.665	0.661	0.310
	N	140	140	139	140
Chest pain	Pearson Correlation	-0.075	0.136	0.115	0.077
	P	0.380	0.110	0.177	0.366
	N	140	140	139	140
Loss of appetite	Pearson Correlation	-0.095	-0.066	-0.061	-0.111
	P	0.263	0.438	0.473	0.194
	N	140	140	139	140
Diabetes	Pearson Correlation	0.076	-0.066	0.128	0.136
	P	0.374	0.438	0.132	0.108
	N	140	140	139	140
Frequent swollen glands	Pearson Correlation	-0.127	0.257*	0.09	0.154
	P	0.134	0.002	0.29	0.069
	N	140	140	139	140
Back pain	Pearson Correlation	-0.127	0.105	0.090	0.038
	P	0.134	0.217	0.290	0.655
	N	140	140	139	140

Table 8 Continued

Health Problem		Outdoor Free Play	Outdoor Organized Activities Or Sports	Indoor Organized Activities Or Sports	Indoor Video Games Or Watching TV
Dizziness	Pearson Correlation	0.000	0.000	0.000	0.000
	P	0.000	0.000	0.000	0.000
	N	140.000	140	139	140
Weight loss of 10lbs or more	Pearson Correlation	0.000	0.000	0.000	0.000
	P	0.000	0.000	0.000	0.000
	N	140	140	139	140
Eating disorders	Pearson Correlation	0.000	0.000	0.000	0.000
	P	0.000	0.000	0.000	0.000
	N	140	140	139	140

*Statistically significant at the 0.05 level.
[z] Possible responses for Outdoor free play were "0-1 hour," "1-2 hour" and "2+ hours".
[y] Possible responses for Outdoor organized activities or sports were "0-1 hour," "1-2 hour" and "2+ hours".
[x] Possible responses for Indoor organized activities or sports were "0-1 hour," "1-2 hour" and "2+ hours".
[w] Possible responses for Indoor video games or watching TV were "0-1 hour," "1-2 hour" and "2+ hours".
[v] Health Problems scores had a possible range of 0-24, and an actual range of 0-8.

Findings Related to Objective Five

Objective five was to examine correlations between parental attitudes toward outdoor environments, their attitudes about their children spending time outdoors and the amount of time children spend in various activities.

Data Analysis. Pearson's product-moment correlations were calculated between parents' attitudes and the combined time spent indoor scores, the combined time spent outdoor scores, the Parental Attitude About Nature score and Parental Attitude About

Children Spending Time Outdoors score. Statistically significant correlations were found between several of the scores. The total time spent indoor score was negatively and statistically significantly correlated with both Parental Attitude about Nature score (r=-0.212, P=0.012) and their Attitude About Their Children Spending Time Outdoors score (r=-0.172, P=0.043). This indicated that as parental attitude about nature scores increased and as their attitude about their children spending time outdoors score increased, the total amount of time children spent indoors decreased.

Also, the total time spent outdoors score was positively and statistically significantly correlated with the Parental Attitude About Nature score (r=+0.208, P=0.014). This showed that as parents' attitude about nature increased (became more positive), the total time children spent outdoors also increased (Table 9).

This agrees with the hypothesis that children of parents who have a positive attitude about nature will spend more time outdoors. This is also logical in that parents who have a better attitude about nature and about their children spending time outdoors will be more willing to allow and help their children have more outdoor play time. Beets et al., (2007) found that this support was an important factor in determining both daughters' and sons' outdoor activity time.

Table 9. **Correlation matrix indicating the Pearson's product-moment correlation between Parental Attitude About Nature score[z], Parental Attitude About Their Children Spending Time Outdoors score[y] the overall time spent indoors score[x] and the overall time spent outdoor score[w] in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.**

Attitude		Total Indoor Score	Total Outdoor Time Score
Attitude About Nature Total	Pearson Correlation	-0.212*	0.208*
	P	0.012	0.014
	N	140	140
Attitude About Children Spending Time Outdoors Total	Pearson Correlation	-0.172*	0.108
	P	0.043	0.206
	N	140	140

*Statistically significant at the 0.05 level.

[z] Scores for Parental Attitude about Nature had a possible range of 21-126 and an actual range of 67-124. Higher Parental Attitude about Nature score indicated a positive view about nature; lower scores indicated a more negative view.

[y] Scores for Parental Attitude About Their Children Spending Time Outdoors had a possible of 29-174 and an actual range of 98-173. Higher Parental Attitude About Their Children Spending Time Outdoors scores indicated a positive view of their children Spending Time Outdoors, lower scores indicated more negative view.

[x]Overall time spent outdoors score was the total score from outdoor free play and outdoor organized activity and sports.

[w]Overall time spent indoors score was the total score from indoor time spent playing video games and watching TV and indoor organized activity and sports.

A Pearson's product-moment correlations were calculated between Parental Attitude About Nature score, Parent's Attitude About Their Children Spending Time Outdoors score, outdoor free play score, outdoor organized activities or sports score, indoor organized activities or sports score and indoor video games or watching TV score.

Table 10. Correlation matrix indicating the Pearson's product-moment correlation between Parents Attitude About Nature score[z], Parental Attitude About Their Children Spending Time Outdoors score[y], outdoor free play score[x], outdoor organized activities or sports score[w], indoor organized activities or sports score[v] and indoor video games or watching TV score[u] in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Activities		Attitude About Nature	Attitude About Children Spending Time Outdoors
How many hours per day does your child spend outdoors in free play on average?	Pearson Correlation	0.224	0.165
	P	0.008*	0.05*
	N	140	140
How many hours per day does your child spend outdoors in organized activities or sports on average?	Pearson Correlation	0.083	-0.020
	P	0.330	0.816
	N	140	140
How much time per day does your child spend indoors in organized activities or sports?	Pearson Correlation	-0.145	-0.157
	P	0.089	0.065
	N	139	139
How much time per day does your child spend indoors on video games or watching TV?	Pearson Correlation	-0.161	-0.088
	P	0.058	0.299
	N	140	140

*Statistically significant at the 0.05 level.

[z] Scores for Parental Attitude About Nature had a possible range of 21-126 and an observed range of 67-124. Higher Parental Attitude About Nature score indicated a positive view about nature; lower scores indicated a more negative view.

[y] Scores for Parental Attitude About Their Children Spending Time Outdoors had a possible of 29-174 and an observed range of 98-173. Higher Parental Attitude About Their Children Spending Time Outdoors scores indicated a positive view of their children spending time outdoors, lower scores indicated more negative view.

[x] Possible responses for outdoor free play were "0-1 hour," "1-2 hour" and "2+ hours"

[w] Possible responses for outdoor organized activities or sports were "0-1 hour," "1-2 hour" and "2+ hours"

[v] Possible responses for indoor organized activities or sports were "0-1 hour," "1-2 hour" and "2+ hours"

[u] Possible responses for indoor video games or watching TV were "0-1 hour," "1-2 hour" and "2+ hours"

Statistically significant but weak positive correlations were found between the Parental Attitude about Nature scale and the number of hours children spent outdoors in free play (r=+0.224, *P*=0.008) and between Parental Attitude About Their Children Spending Time Outdoors scale and the number of hours children spent outdoors in free play (*r*=+0.165, *P*=0.05) (Table 10).

This indicated that the children's number of hours spent outdoors in free play increased, respondents' scores on the Attitude about Nature scale increased, and respondent's scores on the Attitude About Their Children Spending Time Outdoors increased.

Findings Related to Objective Six

Objective six was to study the relationship between Parental Attitude About Their Children Spending Time Outdoors and their children's Health Problems.

Data Analysis. A Pearson's product-moment correlation was run between Parental Attitude About Their Children Spending Time Outdoors score and their reports of their children's Health Problems scores. No statistically significant correlation was found between the two scales (*r*=+0.063, *P*=0.459). This indicated that parents' attitude about letting their children spend time outdoors was not related to their reports of their children's health problems. (Table 11). This contradicts the hypothesis that children who spend more time outdoors will have fewer overall health problems.

Table 11. Correlation matrix indicating the Pearson's product-moment correlation between Health Problems scores[z], Parental Attitude About Nature score[x], and Parental Attitude About Their Children Spending Time Outdoors score[y] in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors, and their children's overall health.

Attitude		Health
Attitude About Nature Total	Pearson Correlation	0.015
	P	0.863
	N	140
Attitude About Children Spending Time Outdoors Total	Pearson Correlation	0.063
	P	0.459
	N	140

[z] Health Problems scores had a possible range of 0-24, and an actual range of 0-8. A higher score indicated a greater amount of health problems and worse overall health, a lower score indicated less health problems and better overall health.

[x] Scores for Parental Attitude About Nature had a possible range of 21-126 and an actual range of 67-124. Higher Parental Attitude About Nature indicated a positive view about nature, lower scores indicated a more negative view.

[y] Scores for Parental Attitude About Their Children Spending Time Outdoors had a possible of 29-174 and an actual range of 98-173. Higher parental attitudes about their children spending time outdoors scores indicated a positive view of their children spending time outdoors, lower scores indicated more negative view.

Findings Related to Objective Seven

Objective seven was to determine parental preferences for play areas based on the natural and artificial elements of the setting.

Instrument Scoring

Photographs of Play Area Section. Respondents were asked to rate five photographs with regards to the statement "I feel completely comfortable allowing my child to play in an area like this with appropriate supervision," on a six-point Likert-type scale (Likert, 1967). The five pictures that were included had play areas which ranged from completely natural (no man-made structures visible) to completely artificial (indoor

play environment, no natural elements visible). Possible responses included "strongly agree," which scored 6 points, "somewhat agree" which scored 5 points, "slightly agree" which scored 4 points, "slightly disagree" which scored 3 points, "somewhat disagree" which scored 2 points, and "strongly disagree" which scored 1 point.

Data Analysis. A Repeated Measures ANOVA was conducted to compare parents' mean responses between the wild, very natural photograph, the outdoor photograph with trees, bench and chain-link fence, the outdoor fenced-in photograph with gravel and nearby trees, the outdoor photograph with hard blacktop surface and the indoor photograph of a gaming room (Appendix A). Statistically significant differences (P=0.001) were found indicating differences in preferences for outdoor areas based on the natural and artificial elements of the settings (Table 12).

Table 12. Repeated measures ANOVA comparing mean responses among photographs of play scene questions in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Picture Type	Sample Size	Mean Response	SD	df	F	*P*
Wild, very natural picture	140	5.28	1.167	3	47.958	0.001*
Outdoor picture with trees, bench and chain-link fence	140	5.66	0.794			
Outdoor picture with fenced in with gravel and nearby trees	140	5.43	0.917			
Outdoor picture with black hardtop surface and trees in background	140	4.73	1.397			
Indoor picture of gaming room	140	4.14	1.634			

*Statistically significant at the 0.05 level

Post hoc analysis (Tukey's HSD) revealed that all the outdoor play scenes had statistically significantly higher mean scores (P=0.001) when compared to the indoor photographs of the gaming room. This indicated that parents in this thesis were more comfortable with their children playing in outdoor spaces when compared to an indoor game room. Also, the outdoor scene with the black hardtop surface and trees in the background had a statistically significantly lower mean score (P=0.001) when compaired to the wild, very natural scene, the outdoor scene with the trees bench and chain-link fence and the outdoor fenced-in scene with gravel and nearby trees. This indicated that parents were more comfortable with their children playing in outdoor areas with more natural elements when compared to children playing in an outdoor area with fewer natural elements (Table 13).

Together these results indicated that parents not only are more comfortable with their children playing outdoors, but also they preferred areas with more natural settings when compared to areas which were devoid of natural elements. This does not completely concur with the hypothesis that parents will prefer settings which are neither completely natural nor completely artificial, but which have a mixture of elements. Other studies have had related findings. Kuo et al., (1998) found that areas with more trees attracted a larger and more diverse group of people, while Taylor et al., (1998) found that areas that were barren had fewer children playing there. Also it was found that mothers gave greater worth to their children's outdoor experiences if there were more green spaces available in the area where they lived (Prezza et al., 2005).

Table 13. Differences between mean responses (Tukey's HSD) on play scene questions in the study of the relationship between parental attitudes toward outdoor environments, their children spending time outdoors and their children's overall health.

Picture Type	Wild, very natural photograph	Outdoor photograph with trees, bench and chain-link fence	Outdoor photograph with fenced in with gravel and nearby trees	Outdoor photograph with black hardtop surface and trees in background
Wild, very natural photograph	-			
Outdoor photograph with trees, bench and chain-link fence	0.381	-		
Outdoor photograph with fenced in with gravel and nearby trees	0.151	0.23	-	
Outdoor photograph with black hardtop surface and trees in background	0.547*	0.928*	0.698*	-
Indoor photograph of gaming room	1.144*	1.525*	1.295*	0.597*

*Statistically significant at the 0.05 level

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter summarizes, presents conclusions for the study and makes recommendations for further studies. The purpose of this study was to investigate the relationship between attitudes of parents toward outdoor environments, and their children spending time outdoors, and how these attitudes related to their children's overall health.

Objectives

1. To study parental attitude toward outdoor environments.
2. To study parental attitude about their children spending time outdoors.
3. To investigate the correlation between parental attitude toward outdoor environments and their attitude about their children spending time outdoors.
4. To study the relationship between the amount of time children spend playing outdoors vs. the amount of time they spend doing indoor activities and their overall health.
5. To examine the correlation between parental attitude toward outdoor environments, their attitude about their children spending time outdoors and the amount of time children spend in various activities.
6. To study the relationship between parental attitude about their children spending time outdoors and their children's overall health.
7. To compare parental preferences for play areas based on the natural and artificial elements of the setting.

The following hypotheses were tested:

H1: Parents who have a positive attitude about nature will have a positive attitude about their children spending time outdoors

H2: Children of parents who have a positive attitude about nature will spend more time outdoors.

H3: Children who spend more time outdoors will have fewer overall health problems.

H4: Parents will prefer settings which are neither completely natural nor completely artificial, but which have a mixture of elements

Results

Parental Attitude, Time Spent Outdoors and Overall Health

Results from this study showed that mean scores for both the Attitude About Nature Scale and the Parental Attitude About Their Children Spending Time Outdoors Scale were high, indicating that most respondents reported a positive view about both nature and allowing their children to play outdoors. Also, a strong positive relationship was found between the Attitude About Nature Scale and the Attitude About Their Children Spending Time Outdoors Scale, revealing that parents who had a positive view about nature also had a positive view of their children spending time in nature.

A statistically significant positive correlation was found between the time spent outdoors in free play, the Attitude About Nature Scale, and Attitude About Their Children Spending Time Outdoors Scale, indicating that the more positive a parent was about nature and about their children spending time outdoors, the more the child played

outdoors in free play. Also, both of these attitudes were negatively correlated with the overall total time their children spent indoors, showing that the more positive parents were about nature and their children spending time in it, the less time their children spent indoors in any activity.

Finally, there was no significant correlation found between parents' attitudes about letting their children spend time outdoors and their children's overall health, indicating that parents' attitudes about letting their children spend time outdoors was not related to their reports of their children's health problems.

Additionally, regarding overall health, statistically significant correlations were found between some activities and health problems. The amount of time children spent indoors on video games or watching TV had a weak positive relationship with the Health Problems score, revealing that the more time children spent indoors watching TV and playing video games, the more health problems they experienced.

Individually, several health problems were significantly correlated with the different activities. Body pain or discomfort, repeated upset stomach and feeling tired or having low energy all decreased if the child spent more time outdoors in free play.

Reports of asthma attacks increased with the more time a child spent in organized sports or activities, regardless of whether those activities took place indoors or outdoors. Also, swollen glands were reported more frequently according to the number of hours per day children spent outdoors in organized activities, while coughing increased according to the number of hours children spent indoors in organized sports.

Finally, children who spent more time indoors on video games or watching TV were more likely to suffer from the health problems of nasal congestion and trouble sleeping. Also, children who spent more time indoors overall were more likely to suffer from asthma attacks, diabetes and frequent swollen glands.

Parental Play Area Preferences

Last, it was found that based on the natural and artificial elements of the different settings, parents had different preferences for the outdoor areas. For example, the indoor photograph of the game room, which contained no natural elements, was preferred less by the parents than any of the outdoor photographs. Also the wild natural photograph, the photograph with trees, a bench and a chain link fence, and the outdoor fenced-in photograph with gravel and nearby trees were all rated higher than the outdoor photograph which contained a black hardtop surface with few natural elements aside from the trees in the background. Together, this indicated that parents not only were more comfortable with their children playing outdoors, but they preferred areas with more natural settings than ones with more artificial surroundings.

Conclusions

1. Results from this study indicated that, in general, parental attitude about nature were positive.

2. Results from this study indicated that parental attitude about their young children spending time outdoors was also positive.

3. Parents who had a positive view about nature also tended to have a positive attitude about their children spending time outdoors.

4. Children who spent a greater amount of time in organized sports, whether indoors or outdoors, tended to have a greater amount of asthma attacks.

5. Children who spent a greater overall amount of time indoors were also more likely to have problems with asthma attacks, diabetes and frequent swollen glands.

6. Children who spent more time indoors playing video games and watching TV had a greater amount of health problems when compared to children who spent more time outdoors, and were more likely to have problems with nasal congestion and sleeping.

7. Children who spent more time outdoors in free play were less likely to experience body pain or discomfort, upset stomach, or low energy.

8. Children of parents who have a positive attitude about nature and their children spending time in it, spent more time outdoors in free play and less overall time indoors.

9. Parents were more comfortable with their children spending time playing in outdoor areas when compared to indoor areas.

10. Parents tended to prefer areas that contained more natural elements when compared to artificial elements.

Recommendations for Additional Research

1. It is recommended that different institutions conduct more studies to see if the results of this study may be replicated.

2. It is recommended that different studies be conducted asking parents to quantify how much time their children spend in the different types of play areas.

3. It is recommended that this study be replicated with a more representative sample of parents from the U.S.

4. It is recommended that this study be replicated with additional indoor pictures added to the play area section.

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APPENDIX A

INSTRUMENT

This appendix includes a copy of the instrument used in this study with descriptions of how it appeared on the internet.

zoomerang

Parents Attitudes about Nature, their children spending time outdoors, and their children's overall health (1)

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Last Modified: March 30 2009, 12:43 PM
Design Theme: Basic Blue
Language: English
Button Options: Labels
Disable Browser "Back" Button: False

Outdoor Attitudes Questionnaire

Page 1 - Heading

You have been asked to participate in a research study evaluating parent's attitudes about their children spending time outdoors and their children's overall health.

If you agree to be in this study, you will be asked to complete an online survey. This study will only require approximately 30 minutes to complete. There are no risks associated with this study. This study is anonymous as it is online and no name is required to take the survey. The records of this study will be kept private. No identifiers linking you to the study will be included in any sort of report that might be published. The name and address you provide at the end will be kept separate from your answers and will only be used to send you your seed packet. Research records will be stored securely and only Danielle Hammond and Dr. Jayne Zajicek will have access to the records. Your decision whether or not to participate will not affect your current or future relations with Texas A&M University. You can withdraw at any time without your relations with the university being affected. You can contact Danielle Hammond (dolphgal@tamu.edu) or Dr. Jayne Zajicek (j-zajicek@tamu.edu) with any questions about the study.

This research study has been reviewed by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Angelia Raines, Director of Research Compliance.

Please do not leave any questions blank. By clicking on the "submit" below, you are giving your informed consent to participate in the study. You are entitled to print a copy of this form for your records.

I have read and understand the explanation provided to me. I have had all questions answered to my satisfaction. I voluntarily agree to participate in this study.

Page 2 - Heading

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by placing a check mark in the appropriate box. Please use the following scale:

Page 2 - Question 1 - Rating Scale - Matrix [Mandatory]

Attitudes About Nature

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
I really enjoy nature.	❍	❍	❍	❍	❍	❍
It is wrong to use a lot of chemicals to kill weeds.	❍	❍	❍	❍	❍	❍
I enjoy watching the sky on summer nights.	❍	❍	❍	❍	❍	❍
I enjoy pictures of birds and animals.	❍	❍	❍	❍	❍	❍
I like sitting beside a quiet pond.	❍	❍	❍	❍	❍	❍
Walking in the woods is a waste of time.	❍	❍	❍	❍	❍	❍
I wish I knew more about nature.	❍	❍	❍	❍	❍	❍
People should spend more time outside.	❍	❍	❍	❍	❍	❍
I like TV programs about nature.	❍	❍	❍	❍	❍	❍
Going on a hike is boring.	❍	❍	❍	❍	❍	❍
I would like to get up early just to see the sun rise.	❍	❍	❍	❍	❍	❍

Page 3 - Heading

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by placing a check mark in the appropriate box. Please use the following scale:

Page 3 - Question 2 - Rating Scale – Matrix [Mandatory]

Attitudes About Nature Cont.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
I would like to vacation in a cabin in the woods.	❍	❍	❍	❍	❍	❍
I feel good when I am close to nature.	❍	❍	❍	❍	❍	❍
I prefer an indoor job.	❍	❍	❍	❍	❍	❍
I like the smell of a lawn just after it has been cut.	❍	❍	❍	❍	❍	❍
I like the sounds that a stream makes.	❍	❍	❍	❍	❍	❍
I like walking through the leaves in the fall.	❍	❍	❍	❍	❍	❍
I prefer family vacations where I spend most of my time indoors.	❍	❍	❍	❍	❍	❍
Spending time outdoors is an enjoyable alternative to watching TV.	❍	❍	❍	❍	❍	❍
Family vacations are a good opportunity to spend time outdoors.	❍	❍	❍	❍	❍	❍
I enjoy eating meals outdoors.	❍	❍	❍	❍	❍	❍

Page 4 - Heading

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by placing a check mark in the appropriate box. Please use the following scale:

Page 4 - Question 3 - Rating Scale – Matrix [Mandatory]

Your Children Spending Time Outdoors						
Playing outside encourages too much aggressive behavior.	❍	❍	❍	❍	❍	❍
All playgrounds should contain natural elements.	❍	❍	❍	❍	❍	❍
Playing outside would be good for my child's health.	❍	❍	❍	❍	❍	❍
There is too much crime for my child to play outside.	❍	❍	❍	❍	❍	❍
I think my child should go on nature hikes.	❍	❍	❍	❍	❍	❍
Playing outside is a wasteful way for children to spend their free time.	❍	❍	❍	❍	❍	❍
My neighborhood is safe enough for children to play outside.	❍	❍	❍	❍	❍	❍
I would let my child walk in the rain even if they got wet.	❍	❍	❍	❍	❍	❍
My child gets too dirty when playing outside.	❍	❍	❍	❍	❍	❍
I am afraid my child may be harmed by strangers outside.	❍	❍	❍	❍	❍	❍
Spending time outdoors is a meaningful family activity.	❍	❍	❍	❍	❍	❍
I worry that my child will be hurt by gangs if he/she plays outside.	❍	❍	❍	❍	❍	❍

My child's learning can be stimulated by outdoor play.	❍	❍	❍	❍	❍	❍
Playing outdoors is hurts my child's school grades.	❍	❍	❍	❍	❍	❍

Page 5 - Heading

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by placing a check mark in the appropriate box. Please use the following scale:

Page 5 - Question 4 - Rating Scale – Matrix [Mandatory]

Your Children Spending Time Outdoors Cont.

Playing outdoors is a good way to improve hand-eye coordination.	❍	❍	❍	❍	❍	❍
Other children in my neighborhood are safe for my child to play around.	❍	❍	❍	❍	❍	❍
Road safety is a concern for children in my neighborhood.	❍	❍	❍	❍	❍	❍
Children who play outdoors gain confidence.	❍	❍	❍	❍	❍	❍
I allow my child to have a wide range of recreational outdoor activities from which to choose.	❍	❍	❍	❍	❍	❍
I feel that outdoor play interferes too much with my child's homework time.	❍	❍	❍	❍	❍	❍

My child is easier to manage after spending time outside.	❍	❍	❍	❍	❍	❍
I am afraid my child may be abducted outdoors.	❍	❍	❍	❍	❍	❍
I let my child make mud pies.	❍	❍	❍	❍	❍	❍
Taking part in outdoor recreation improves my child's communication skills.	❍	❍	❍	❍	❍	❍
Outdoor activities over stimulate my child.	❍	❍	❍	❍	❍	❍
Taking part in outdoor activities helps to build up my child's level of independence.	❍	❍	❍	❍	❍	❍
I would let my child play in a sand box.	❍	❍	❍	❍	❍	❍
Outdoor activities are a good way for my child to make friends.	❍	❍	❍	❍	❍	❍
Participating in outdoor play is a good way for my child to get exercise.	❍	❍	❍	❍	❍	❍

Page 6 - Heading

INSTRUCTIONS: Please evaluate each picture shown with regards to the following statement: I feel completely comfortable allowing my child to play in an area like this with appropriate supervision.

Page 6 - Image

Page 6 - Question 5 - Rating Scale - One Answer (Horizontal) [Mandatory]

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
○	○	○	○	○	○

Page 6 - Image

Page 6 - Question 6 - Rating Scale - One Answer (Horizontal)[Mandatory]

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
○	○	○	○	○	○

Page 7 - Heading

Continued... I feel completely comfortable allowing my child to play in an area like this with appropriate supervision.

Page 7 – Image

Page 7 - Question 7 - Rating Scale - One Answer (Horizontal)[Mandatory]

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
○	○	○	○	○	○

Page 7 – Image

Page 7 - Question 8 - Rating Scale - One Answer (Horizontal)[Mandatory]

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
○	○	○	○	○	○

Page 7 – Image

Page 7 - Question 9 - Rating Scale - One Answer (Horizontal)[Mandatory]

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
○	○	○	○	○	○

Page 8 - Question 10 - Choice - Multiple Answers (Bullets) [Mandatory]

Has your child ever had reoccurring problems with any of the following health symptoms?

- ☐ Limitations in any of the following activities due to health problems: riding a bike, running, or playing sports?
- ☐ Body pain or discomfort
- ☐ Headache
- ☐ Chest Pain
- ☐ Dizziness
- ☐ Loss of appetite
- ☐ Frequent swollen glands
- ☐ Cough
- ☐ Repeated upset stomach
- ☐ Constipation, loose bowels or diarrhea
- ☐ Weight loss of 10lbs or more
- ☐ Asthma attacks
- ☐ Itchy or watery eyes
- ☐ Colds
- ☐ Nasal congestion
- ☐ Ear infection or ear ache
- ☐ Sore throat
- ☐ Nervousness
- ☐ Back Pain
- ☐ Feeling tired or having low energy
- ☐ Trouble sleeping
- ☐ Overweight/Obesity
- ☐ Diabetes
- ☐ Eating disorders
- ☐ None of the Above

Page 8 - Question 11 - Open Ended - Comments Box

Please explain any major medical issues your family has a history of.

Page 9 - Heading

Please click on the most accurate response.

Page 9 - Question 12 - Choice - One Answer (Bullets)

What is your gender?

- ○ Male
- ○ Female

Page 9 - Question 13 - Choice - One Answer (Bullets)

What is your child's gender?

- ○ Male
- ○ Female

Page 9 - Question 14 - Open Ended - One Line

What is your child's age?

Page 9 - Question 15 - Open Ended - One Line

How many children do you currently have?

Page 9 - Question 16 - Choice - One Answer (Bullets)

Please indicate the birth order of the child you are answering for

- ○ 1st
- ○ 2nd
- ○ 3rd
- ○ 4th
- ○ 5th
- ○ Other, please specify

Page 9 - Question 17 - Choice - One Answer (Drop Down)

What is your ethnicity?

- ○ White
- ○ Hispanic

- African American
- Asian-Pacific Islander
- Native American
- None of the Above

Page 9 - Question 18 - Choice - One Answer (Drop Down)

What is your current marital status?

- Single, Never Married
- Married/Partnered
- Separated
- Divorced
- Widowed

Page 10 - Heading

Please circle the most accurate response.

Page 10 - Question 19 - Choice - One Answer (Bullets)

Which of the following most accurately describes the area in which you reside?

- Rural
- Suburban
- Urban
- Inner City

Page 10 - Question 20 - Choice - One Answer (Drop Down)

How many hours per day does your child spend outdoors in free play on average?

- 0-1 hour
- 1-2 hours
- 3-4 hours
- 4+ hours

Page 10 - Question 21 - Choice - One Answer (Drop Down)

How many hours per day does your child spend outdoors in organized activities or sports on average?

- 0-1 hour
- 1-2 hours
- 3-4 hours
- 4+ hours

Page 10 - Question 22 - Choice - One Answer (Drop Down)

How much time per day does your child spend indoors in organized activities or sports?

- None
- < 30 min
- 30 min -1 hour
- 1-2 hours
- 2+ hours

Page 10 - Question 23 - Choice - One Answer (Drop Down)

How much time per day does your child spend indoors on videos games or watching TV?

- None
- < 30 min
- 30 min -1 hour
- 1-2 hours
- 2+ hours

Page 10 - Question 24 - Choice - One Answer (Bullets)

What is your education level?

- Less than high school (no degree)
- High school graduate
- Some college
- 4 year college degree
- Graduate School
- Other

Page 10 - Question 25 - Choice - One Answer (Bullets)

What is your average income level?

- Less than $9,999
- $10,000 - $14,999
- $15,000 - $24,999
- $25,000 - $34,999
- $35,000 - $49,999
- $50,000 - $74,999
- $75,000 - $99,999
- $100,000 - $149,999
- $150,000 and above

Page 11 - Heading

Thank you for your participation in this survey. As a token of our appreciation, we would like to send you a free wildflower seed packet. The following page will ask you to provide your name and address so we may send you the packet. This information will not be connected in any way with your responses and will be destroyed when your gift is sent. Again thank you for your participation!

Page 12 - Question 26 - Name and Address (U.S)

Please enter the name and address you would like your seed packet sent to.

- Name
- Company
- Address
- City
- State
- Zip

Thank You Page

Thank you again for participating in this survey. Your responses are appreciated! <http://aggie-horticulture.tamu.edu/>

<http://aggie-horticulture.tamu.edu/>

Screen Out Page

Thank you for your interest. However, at this time we are looking for participants who fit a different profile. <http://aggie-horticulture.tamu.edu/>

Over Quota Page

Thank you for your interest, however this study has been completed and is now closed. <http://aggie-horticulture.tamu.edu/>

Survey Closed Page

This survey is no longer available for input. <http://aggie-horticulture.tamu.edu/>

VITA

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EDUCATION

Texas A&M University, College Station, TX
Master of Science in Horticulture, 2009
GPA 4.0

Brigham Young University, Rexburg, ID
Bachelor of Science in Psychology, 2007
Minor in Child Development
Phi Theta Kappa Honor Society Member
GPA 3.9

AWARDS

Excellence Assistantship, A&M Graduate School, 2009

RELATED WORK EXPERIENCE

Teaching Assistant for Floral Design, Texas A&M University, College Station, TX, 2007-2009

Developed speaking and presentation skills through teaching, demonstrating and supervising floral design for about 20 students at a time.

Created and refined curriculum according to the class objectives to make it more efficient and effective.

Communicated with students regularly to understand their concerns and help them understand the material.

MEMBERSHIPS

American Institute of Floral Design, Student Chapter
Was able to attend 2009 AIFD symposium as part of student chapter