ABSTRACT

DOUGHERTY, COLLEEN. Parental Attitudes toward Nature and their Association with Children's Outdoor Active Play. (Under the direction of Dr. Myron Floyd.)

Parents of young children are increasingly encouraged to motivate their children to spend more time participating in outdoor activities. Motivating today's youth to live a more active lifestyle and to spend more time outside is a response to serious health concerns affecting adults and children alike. Although parents are the most important influence shaping children's lives, little is known about how parental attitudes regarding the outdoors relate to children's involvement in outdoor activities.

This study examined how parental attitudes toward nature and outdoor unstructured active play relate to their children's involvement in outdoor play. The study used leisure socialization, environmental socialization, gender role theory, as well as age and developmental influences, to provide perspective on parents' role in children's play behaviors. The study addressed four objectives: (1) describe parental attitudes toward nature and outdoor unstructured play, (2) describe parental attitudes toward their children's participation in outdoor unstructured play, (3) examine the association among parental attitudes toward nature and their attitudes toward their children's outdoor unstructured play, and their children's participation in outdoor activities; and (4) determine whether associations between parental attitudes toward nature and their children's outdoor unstructured play participation vary by gender and age. Children's participation in outdoor activities encompassed two dependent variables: the number of days the child spends in outdoor unstructured play during the week and independent mobility.

The population for this study was parents with one or more children between the ages of 6 to 14. Qualtrics was used to select the sample and administer an online survey of parents. The survey yielded 407 completed questionnaires. Measures developed by McFarland, Hammond, Zajicek and Waliczek (2011) were used to measure parental attitudes toward nature (PAN) and parental attitudes toward their child's outdoor play (PACOR). Measures of children's outdoor activity and amount of time playing outside were adapted from items developed by Kerr, Sallis, Rosenberg, Norman, Saelens and Durant (2008). Distance children are allowed to play away from home unsupervised was measured by items developed by Prezza, Pilloni, Morabito, Sersante, Alparone and Giuliani (2001).

Descriptive statistics were used to summarize and describe the study variables. Chi-square tests of association and logistic regression analysis were used to explore relationships between parental attitudes, children's outdoor play behaviors, parent's gender, child's gender and child's age. Some key findings were that positive parental attitudes about nature and about children spending time in the outdoors were associated with more time children had outdoors in outdoor active play during a typical week. Significant effects of parent or children's gender on the association between parent attitudes and their children's outdoor active play were not observed. Age was an important predictor of independent mobility.

Research exploring parental environmental attitudes is essential to provide information to improve communication with parents about the benefits of outdoor play. Additionally, the findings from this study can be used to help develop and enhance outdoor program opportunities for children. Ultimately, in view of the numerous social, physical, and developmental benefits that children get from outdoor play, the study sought to provide new information that can make these benefits more widely available to children and their families.

Parental Attitudes toward Nature and their Association with Children's Outdoor Active Play

by
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Introduction

Parents of young children are increasingly encouraged to motivate their children to spend more time participating in outdoor activities. Motivating today's youth to live a more active lifestyle and to spend more time outside is largely a result of the obesity epidemic and concerns about the lack of contact children have with nature. According to the National Recreation and Park Association (2015), poor nutrition, sedentary lifestyles, and unhealthy habits contribute to an array of health risks among children today. In his best-selling book, *Last Child in the Woods*, Richard Louv (2008) reviewed numerous studies that link lack of outdoor play to increased childhood obesity and mental disorders. Additionally, compared with the previous generations, children are participating less outdoors in active free play (Ferrao & Janssen, 2015; Veitch, Salmon, & Ball, 2010).

Outdoor play in natural settings has been connected to numerous physical, psychological and social benefits for children. Several studies have shown that outdoor active play is positively correlated with various beneficial health outcomes (Godbey, 2009). Furthermore, McFarland, Zajicek and Wallczek (2014) reported that time spent outdoors is a crucial predictor of children's overall physical activity level. Abundant empirical evidence shows that children are more active when they are outdoors compared to when they are indoors (Gray et al., 2015; Tremblay et al., 2014). Regular physical activity reduces risk of overweight and obesity, some cancers, diabetes, cardiovascular diseases, and psychological disorders (Beyer, Heller, Bizub, Kistner, Szabo, Shawgo & Zetts, 2015). Additionally, physical activity during childhood is one of the strongest predictors of adult physical activity (Beyer et al., 2015). Evidence has shown that encouraging

and establishing an active lifestyle among children is easier and more effective than promoting physical activity among adults (Beyer et. al, 2015).

Outdoor play has also been associated with cognitive development and mental wellbeing among children. For example, Kuo and Faber Taylor's (2004) research indicates that outdoor play and contact with nature are associated with reduced symptoms of attention deficit disorder (ADD) in diagnosed children. They found ADD symptoms were more significantly reduced in "green settings" compared to indoor settings. Kuo and Faber Taylor concluded that exposure to natural settings during common after-school and weekend activities appear to be effective in managing attention deficit disorder (Kuo & Taylor, 2004). Faber Taylor, Kuo, and Sullivan (2001) found that children living in apartment buildings with access to green views performed better on impulse control tests compared to children living in apartments with barren views. Furthermore, children with fewer opportunities for outdoor play were more susceptible to depression, anxiety, stress, and narcissism. Other studies suggest that regular participation in outdoor leisure help children learn how to solve problems, self-regulate, and value intrinsic interests (McFarland et. al, 2014).

Outdoor play also contributes to children's social development. Outdoor play spaces provide an important context for the development and maintenance of their relationships, therefore contributing to the generation of social capital (Yuen, Pedlar & Mannell, 2005). Participating in nature-based activities with minimal man-made structures can aid in fostering deep relationships with peers leading to a sense of belonging and connectedness (Garst, Browne & Bialeschki, 2011). Within minimally structured outdoor settings children have more freedom to set their own rules for interacting with their peers while playing. This encourages learning and a greater sense of autonomy and agency in social situations (Bixler, Floyd, & Hammitt, 2002;

Pacilli, Giovannelli, Prezza, & Augimeri, 2013). Furthermore, research has shown that outdoor experiences, specifically summer camps based in the outdoors, improve physical and thinking skills, environmental awareness, as well as independence and self-identity when interacting with others (Henderson, Whitaker, Bialeschki, Scanlin & Thurber, 2007).

These and other studies suggest that childhood participation in outdoor play activities has important immediate and long-term implications. Continued participation in unstructured outdoor play activity should be encouraged to foster healthy development and strengthen pro-environmental attitudes and behaviors (Asah, Bengston, & Westphal, 2012).

Parental Influences on Children's Outdoor Play

To encourage children to spend more time in outdoor play activities, the influence of parents on their children's outdoor active play must be understood. Parental attitudes and behaviors have the strongest and most prominent influence on children's outdoor activities and attitude development (McFarland et al., 2014; Barnett & Chick, 1986). Studies have shown that parental attitudes toward the outdoors are related to the amount of physical activity children get and amount of time children participate in outdoor physical activity (Ferrao & Janssen, 2015; Hammond, McFarland, Zajicek, & Waliczek, 2011; Anderrsen & Wold, 1992; Biddle & Goudas, 1996; Pugliese & Tinsley, 2007; Welk, Wood & Morss, 2003).

Research on environmental socialization suggests that parents with positive attitudes towards nature are likely to encourage their children to participate in unstructured outdoor play. According to Chawla (2009), respondents interviewed in retrospective studies of conservation behavior "typically began by describing free play and exploration in nature in childhood, family activities, and influential family members" (p. 9). Parents have been shown to make outdoor

experiences possible by allowing outdoor exploration, sending children to camps, and living near natural areas (Vadala et al., 2007). Furthermore, parents facilitate outdoor play by allowing children to come home dirty and to collect nature items (e.g., rocks, bugs, etc.). Participation in unstructured play in the outdoors provides opportunities to instill familiarity about the outdoors (including nearby nature) and positive beliefs about the environment (Bixler et al., 2002). Previous research also suggests that parents with pro-environmental attitudes encourage their children to be independently mobile and to explore their neighborhoods (e.g., Bixler et al., 2011; Vadala et al., 2007). We would expect parents who have more positive attitudes about nature would prioritize their children playing outdoors rather than indoors and that this in turn would lead to greater levels of outdoor play (Hammond et al., 2011).

Purpose Statement

In summary, although many studies have indicated that parents are the most important influence shaping children's lives, little is known about how parental attitudes regarding the outdoors relate to children's involvement in outdoor activities (Veitch et al., 2010; Veitch, Bagley, Ball & Salmon, 2006). Ferrao and Janssen (2015) stated that one of the most important gaps in the literature is the establishment of the influence of parental encouragement on children's outdoor unstructured active play outside the school setting. Past research has also indicated that the examination of the outdoor unstructured active play domain is limited. This includes the location in which children play outdoors and the correlates associated with their choice of location and activity (Ferrao & Janssen, 2015; Veitch et al., 2006; Henderson, Whitaker, Bialeschki, Scanlin & Thurber, 2007). Finally, Larson, Green, and Cordell (2011) observed that few studies have examined children's time in outdoor activity on a large geographic scale. Conducting additional research on parental attitudes toward their child's

outdoor unstructured active play would provide useful information to improve communication to parents about the benefits of outdoor active play. It would also assist recreation agencies and other youth serving organizations in their efforts to serve children and families. A study on parental environmental attitudes and children's play behavior can also add to the research literature on parent-child interactions in recreation settings.

Research Objectives

The purpose of this research was to examine how parental attitudes related to nature-based activities are associated with their children's participation in outdoor unstructured active play. This study addressed four inter-related objectives:

1. Describe parental attitudes toward nature and outdoor unstructured active play.
2. Describe parental attitudes toward their children's participation in outdoor unstructured active play.
3. Examine the association among parental attitudes toward nature and their attitudes toward their children's outdoor unstructured active play and their children's participation in outdoor unstructured play.
4. Determine whether associations between parental attitudes toward nature and their children's outdoor unstructured active play participation vary by gender and age.

Definition of Terms

The following definitions of key concepts are used in this study:

Environmental Socialization: The process of how one learns about nature and environmental issues. According to Bixler et al. (2002), environmental socialization includes attaining knowledge, developing attitudes and expected outcomes toward the natural environment.

Independent Mobility: Independent mobility refers to the freedom and autonomy children have to move about without parental supervision. Following Alparone and Pacilli (2012, p.114), independent mobility is treated as "freedom of movement and is interpreted 'as children being able to play outdoors, go to school, visit friends, go to clubs or associations, and go shopping all by themselves'."

Leisure Socialization: A process by which basic leisure knowledge, attitudes, values, skills, and motives are learned and internalized (Iso-Ahola, 1980).

Structured Play: Following Fletcher, Nickerson, and Wright (2003, p. 642), structured play will be defined as activities that are "organized by adults around specific social or behavioral goals. Examples include children's involvement in sports leagues, music lessons, or scouting activities."

Outdoor Active Play: Outdoor active play will be defined as physical activity which takes place outdoors in a child's free time (Brockman, Jago, & Fox, 2011, p.1).

Outdoor Unstructured Active Play: Following Fletcher, Nickerson, and Wright (2003, p. 642.), unstructured play will be defined as "activities that are more spontaneously in children's lives, and may include time spent engaged in social interactions with friends or siblings indoors or outdoors, reading or listening to music alone, or engaging in spontaneous play activities.

Review of Related Literature

Defining Outdoor Unstructured Active Play

Before reviewing literature on the importance of parental influences on children's play behaviors, the dimensions of play as used in this study are described. Scholars have found it difficult to define play because the concept is complex and ambiguous (Eberle, 2014). Play is complex because it can take various forms. For example, play can be free and ungoverned, such

as using a stick as a magical wand or blankets to build a fort, or it can be "fixed and codified," such as when soccer or basketball players follow the unconditional "laws" of the game (Eberle, 2014, p.214). Play has been defined in previous work as "exercise," "free and unimpeded movement," "any brisk activity," or "flit and flutter movements" (Eberle, 2014, p.214).

The focus of the current study is outdoor unstructured active play. Thus it is important to distinguish between structured and unstructured active play. Structured active play refers to activities that can be organized by adults around specific social or behavioral goals (Fletcher et al., 2003). Some examples of structured active play include children's involvement in sport leagues, music lessons, or scouting activities. Structured play can also include outdoor active play activities. This study focused primarily on outdoor unstructured active play. According to Fletcher et al. (2003), unstructured active play refers to activities that are more spontaneous in children's lives, and may include time spent engaged in social interactions with friends or siblings indoors or outdoors, reading or listening to music alone, or engaging in spontaneous play activities (Fletcher et al., 2003, p.642). An additional definition is taken from Brockman, Jago, and Fox (2011), outdoor active play is unstructured physical activity which takes place outdoors during children's free time (p.1).

Previous research indicates that outdoor unstructured play can contribute to social and emotional growth benefits for children (Milteer & Ginsburg, 2012). Focusing on outdoor unstructured play is especially important because it usually takes place in the neighborhood environment. Neighborhood outdoor play can provide opportunities for less structured play and more opportunities for social interaction (Humbert, Chad, Spink et al., 2006). Beyond these benefits, outdoor unstructured play offers opportunities for inexpensive forms of physical activity, such as walking, running, climbing or cycling. Outdoor unstructured play is also more

accessible to children since it is less reliant on parents to provide transportation to a structured activity (Carver, Timperio, & Crawford, 2008). Furthermore, researchers believe that positively changing parents' knowledge, attitudes and beliefs regarding the outdoors would be a significant factor in increasing children's participation in outdoor unstructured play (McFarland et al., 2011).

Limited research exists on parental attitudes toward nature and how they affect children's outdoor unstructured play. Greater understanding of the role of parents' influence on children's unstructured play can inform programs to increase children's engagement and participation in the outdoor environment.

Theoretical Approach

Theoretical perspective for this study was based on four concepts important to understanding how parents influence their children's outdoor play: leisure socialization, environmental socialization, gender roles, age and developmental influences. The following section reviews these concepts.

Leisure Socialization

In general, socialization refers to how we learn the norms of the broader society and the more personal communities in which we live. According to Iso-Ahola (1980, p. 132) leisure socialization is "a process by which basic leisure knowledge, attitudes, values, skills, and motives are learned and internalized." Kleiber (1997) discussed two forms of leisure socialization: the first form, is the process of being socialized into leisure, in which one attains the motives, attitudes, values and skills that affects leisure choice and behavior. The second form, socialization through leisure, occurs when involvement in an activity is used to

communicate other skills or values, such as environmental appreciation. Leisure socialization begins during early childhood and continues to evolve over the lifespan. Parents, peers and community institutions constitute the major sources of socialization influences (Iso-Ahola, 1980). This study focused on parents and their influence on their children's outdoor activities.

The importance of early life socialization is well-established in the leisure studies literature. In one of the earliest studies, Sofranko and Nolan (1972) examined how early-life experiences with hunting and fishing related to adult participation in those activities. Based on a survey of Pennsylvania fishing and hunting license holders, they found that residence in youth and the source of introduction to hunting and fishing were related to the extent of their participation during their youth. For both activities, respondents who participated frequently or on occasion during their youth were introduced to the sport by their parents. Results also showed that frequent participation during youth was related to high levels of adult participation Sofranko and Nolan's study was one of the earliest studies to demonstrate the importance of family in leisure socialization.

Another early study of leisure socialization conducted by Kelly (1974) explored when and with whom leisure activities are learned. From interviews of adults in a mid-western community, he found that the majority of their leisure activities were related to family associations. Kelly also found that about 50 percent of leisure activities were learned in childhood in family activity with the rest begun in adulthood.

These two early studies established that leisure socialization is a lifelong process. These studies also documented the critical role that families and parents play in shaping their children's leisure behavior.

More recently researchers have described some of the processes involved in leisure socialization. Hutchison et al. (2003) described how parents structured their children's activities by approving and disapproving of activity, communicating expectations, and directing activities for their children. Shannon (2006) suggested communication plays a significant role in leisure socialization. Her research explored how children perceive the messages that parents communicate about the role of leisure in their lives. Shannon used semi-structured, face-to-face interviews with ten males and ten females in grade 12 involved in extracurricular school activities. Her results indicated that parents influenced their children's participants' leisure activity choices through verbal messages and sanctioning acceptable activities.

Thompson, Rehman, and Humbert (2005) sought to identify prevalent influences on the behaviors of children toward active leisure. Using in-depth interviews with 22 students, 3rd grade to 11th, they observed that children were more likely to be involved in leisure activities when parents were directly engaged in leisure activities with them. Moreover, parents had the most impact on their elementary aged child when it came to leisure socialization and the engagement of leisure opportunities. Overall, a common thread found in the results was the significance of parental influence on leisure involvement no matter the age of the child.

A more current longitudinal study conducted by Lam and McHale (2015) explored the developmental patterns in youth leisure-time from middle childhood to adolescence. The study focused on children's physical activity. Results from the study showed that leisure-time for youth increased during middle childhood and declined across adolescence. Furthermore, the decline of active leisure was more pronounced for girls than for boys. The decline of active leisure was attributed to parents being less involved in children's leisure as their children entered

adolescence. This finding further illustrates the role of parents in shaping their children's leisure activities.

In summary, research evidence consistently shows the importance of parents in their children's leisure. Parents are primary socializing agents providing the first introduction of leisure activities into their children's lives. Studies have confirmed that attitudes within the family and the value that parents place on healthy leisure activities can be strong predictors of youth's intentions to participate in active leisure (Taylor, Ward, Zabriskie, Hill, & Hanson, 2012). The following section discusses research on how children are socialized into outdoor nature-based activity.

Environmental Socialization

Environmental socialization refers to the process of how one learns about nature and environmental issues. It is an interactive process determined by a person's experience, beliefs and behaviors, but also by actions and memories formed during childhood (Chawla, 2009, p. 9). This process includes acquiring knowledge, developing attitudes and expected outcomes, and intentions toward nature and consists of an array of factors contributing to concern for the natural environment (Bixler et al., 2002). According to Bixler, James and Vadala (2011) environmental socialization requires repeated exposure and diverse experiences with the natural environment within supportive social contexts. Most children develop these experiences by playing in the outdoor environment (Vadala, Bixler, & James, 2007). According to Chawla (2009), family members and positive childhood outdoor play experiences are among the most frequently mentioned "socializers." Furthermore, the literature indicates that when parents act as social facilitators of nature-based activities, their children are more likely to participate in outdoor-based activities in the present and future. For example, Vadala et al. (2007) concluded that

parents play a role in environmental socialization by creating access to nature through choosing a home location and granting freedom for their children to explore and play.

Giving permission to explore natural areas and childhood play in nature reflect the values of parents' views toward nature. Vadala et al. based these conclusions on data collected from interviews of field naturalists, environmental educators and conservationists between the ages of 18 to 35. Participants were asked to describe current levels and types of environmental-orientated activities, as well as to describe how their interests developed from childhood to the present. The study showed that parents who were supportive and trusting of the outdoor environment made outdoor play experiences available for their children (Vadala et al., 2007). Parents guided play by choosing to live near nature, experiencing it directly, and through discussion with their children. Parents also sent their children to camp and traveled with their children to wild places. Parents often set boundaries that allowed for further exploration among wild environments near their homes. Additionally, parents facilitated outdoor play by allowing children to come home dirty and allowed the collection of nature items (e.g., rocks, bugs, etc.) while playing outdoors. Parents also bought books and magazines devoted to the scientific aspects of nature for the home to reinforce learning about nature. Overall, Vadala's et al. research reaffirms the importance of parental facilitation of unstructured play activities in and around wild and rural spaces. Chen and Monroe (2012) measured children's connection to nature and related it to previous experiences and family values toward nature. They reported a significant and positive correlation between children's connection to nature and nature near their homes. Furthermore, they reported that family values toward nature were also a strong predictor of children's participation with nature and their interest in environmentally friendly practices.

Chen and Monroe (2012) concluded that children's attitudes and behaviors are highly influenced by parents.

Closely related to the current study, McFarland, Zajicek and Wallczek (2014) investigated the relationship between parental attitudes toward nature, parental attitudes toward children's outdoor recreation, and the amount of time children spend in outdoor free play activities. McFarland et al. (2014) used a convenience sample of parents of children 3 to 5 years old drawn from two university child development centers in Texas. They reported that the children experienced restrictions on the quantity of time spent outdoors. In addition, parent attitudes about the outdoors and nature were related to the amount of time children spent outdoors playing. They also found that children's overall outdoor activity was positively correlated with parent's physical activity, suggesting that children model their parent's behavior.

These studies help to show why environmental socialization can provide perspective on understanding parental influences on children's outdoor unstructured play. Parents with more positive attitudes about the outdoors should be more likely to encourage outdoor play over indoor play. Encouraging their children to participate in unstructured outdoor play provides opportunities to instill familiarity about the outdoors (including nearby nature) and positive beliefs about the environment (Bixler et al., 2002). Previous research also suggests that parents with pro-environmental attitudes encourage independent mobility and exploration of the neighborhood environment (e.g., Bixler et al., 2011; Vadala et al., 2007).

The connection between independent mobility and children's unstructured outdoor active play is further supported by empirical research. A study conducted by Page, Cooper, Griew, and Jago (2010) found that greater independent mobility among children was associated with increased physical activity outdoors. A primary feature of the study was to investigate whether

independent mobility and perceptions of the outdoor environment were associated with frequency of participation in outdoor play. Among boys and girls, independent mobility and positive perceptions (e.g., perceived safety) were positively associated with increased physical activity. Moreover, higher levels of independent mobility were also related to higher levels of active commuting for males, such as walking to school alone. A study conducted by Wen, Kite, Merom, and Rissel (2009) found that children who were mostly allowed to walk alone, or near where they lived, were more likely to spend at least 30 minutes playing outside after school compared to those who were never allowed to walk alone or near where they lived. Such studies highlight the role of the neighborhood environment as an influence on children's outdoor play and do not incorporate measures of parental attitudes or supervision.

Research focused on childhood environmental socialization demonstrates the importance of understanding parental beliefs and attitudes when it comes to describing or explaining children's involvement in outdoor activities. Parents can guide play by choosing to live near nature, by encouraging their children to experience it directly, through discussion with their children, and allowing greater independent mobility to explore their neighborhoods (Vadala et al., 2007).

Gender Role Theory

Gender role theory seeks to explain how social norms and behaviors related to sex differences define standards and expectations for individuals' leisure behavior (Shaw, Kleiber & Caldwell, 1995). Henderson, Bialeschki, Shaw, and Freysinger (1999) described the relationship of gender to leisure as mutually interactive, such that gender may influence an individual's choice of leisure. At the same time, leisure can reinforce gender roles. A large amount of

feminist research focuses on explaining how gender roles reinforce stereotypes and impose constraints on women's leisure (Henderson et al., 1999).

This study considers gender as an important construct because gender shapes socialization experiences. Existing literature provides abundance evidence that variations in leisure participation and interests are associated with gender (Henderson & Gibson, 2013; Shannon & Shaw, 2008; Henderson et al., 1999; Poole, 1986). Therefore, socialization experiences are likely to be different for female and male children. Furthermore, the notion that identity development is socially constructed and dependent upon environmental influences, such as parents is widely accepted (Shaw et al., 1995). Therefore, existing theory and research evidence provide strong rationale for including gender in this study.

For example, Kimiecik and Horn (1998), guided by the Family Influence Model, examined the role of parental beliefs in their children's moderate-to-vigorous physical activity (MVPA). One of the primary purposes of their study was to determine if parental beliefs regarding their children's MVPA were related to gender. Their participants consisted of 81 children (26 girls and 55 boys), between the ages of 11 and 15 years and their parents (N=142). Findings demonstrated that mothers and fathers did not differ significantly from each other in their perceptions of their child's physical ability. However, mothers and fathers did differ significantly on the reasons why they might want their children to participate in physical activities. Furthermore, both parents positively endorsed physical and mental health benefits, but mothers emphasized these reasons to a greater extent compared to fathers. Additionally, although fathers were important in the development of children's physical activity behaviors, mothers' beliefs about children's physical activity were as important as or more important than fathers' beliefs. Even though mothers and fathers differed in their beliefs, they did not differ as a

function of the child's gender. Mothers of boys did not differ from mothers of girls in their beliefs, and fathers of boys did not differ from fathers of girls with respect to beliefs about their physical activity.

An earlier study by Barnett and Chick (1986) explored how much of children's play is influenced by their parent's leisure. The selected population included 32 children enrolled in several preschool day care centers. Results from in-depth interviews of parents and teachers, indicated that gender of the parent and gender of the child was associated with the child's overall leisure participation. Specifically, their findings indicated that both parents' influences boys' play more than girls' play activity. Boys were more influenced by their mother's leisure activity preferences than by their father's choices. Overall there was little relationship between the young girls' play style and parents' satisfaction with leisure. Other findings showed that boys who were most creative with their play had parents involved in a wide variety of leisure activities. Boys who were physically active in their play had fathers who reported health, fitness, and education to be minor motivations for their leisure interest. The major conclusion from the study was that play behaviors were influenced by gender of the parent and gender of the child.

Davidson, Cutting, and Birch's (2003) study of parenting strategies highlight how gender affects parenting roles. Focusing on girl's physical activity, they demonstrated that mothers and fathers do favor different strategies when encouraging their daughters to be active. Mothers provided higher levels of logistic support, in which they were more likely to enroll their daughters in sports, and to support their daughters at sporting events. In contrast, fathers were more likely to use their own behavior to encourage activity, by leading family outings involving physical activity. However, even though parent strategies for physical activity differed, both forms of support were associated with higher levels of physical activity among girls (Davidson et

al., 2003). Overall, this study provided evidence of gender differences in general parenting strategies, such that mothers typically adopt a nurturing role, whereas fathers adopt a more hands-on, playful approach to parenting.

Another recent study conducted by Shannon and Shaw (2008) focused on understanding the role mothers play in developing their daughter's leisure attitudes, values and behaviors. Based on semi-structured interviews with 12 mother-daughter dyads, the researchers observed that mothers provided intentional messages about leisure toward their daughters. Mothers within the sample influenced their daughter's leisure by attempting to pass on their interests, teaching about traditional roles of mothers within a family, and by modeling leisure knowledge, skills, and interests.

Age and Developmental Influences

As children develop and mature changes in their levels of physical activity occur. At the same time, parenting strategies that influences children's play and activity also change as children age. As a result, the age of children could be an important source of variation when examining parental attitudes toward their children's outdoor activity and their children's play behaviors. Consideration of children's development holds important implications for studying their physical activity behaviors (Bocarro, et al., 2009). Consistently, studies show that both younger children, and girls particularly, experience more restrictions on their outdoor play and use of public spaces compared to older children and boys (Hillman, 1993; Moore, 1986; Prezza, 2007; Prezza & Pacilli, 2007; Merom, Tudor- Locke, Bauman, & Rissel, 2006).

In a national survey focused on how much time children spend outdoors, Larson et al. (2011) reported that children ages 6 to 12 were more likely to spend more time outdoors playing

compared to children ages 13-19, and children ages 6 to 9 preferred playing outdoors compared to other age groups of children. In a study of park-based activity, Floyd et al. (2011) found that children age 5 and under participating in structured activity were significantly less active than other age groups. In a follow up study, Bocarro et al. (2015) found gender and age differences in children's physical activity in parks. Activity for boys age 5 and under was negatively and significantly affected by structured activity compared to girls and boys in older age groups.

In terms of total physical activity, research consistently shows that physical activity declines as children age (Troiano et al., 2008; Wall et al., 2011). For example, Sherar, Esliger, Baxter-Jones, & Tremblay (2009) reported that minutes of moderate and vigorous activity (measured by accelerometer) declined between 9 and 12 compared to 10 and 13. This longitudinal study showed that free-time physical activity declines significantly after peaking at age 13 for both boys and girls. Organized physical activity exhibited the same pattern after peaking at 14.

Several studies demonstrate that the ability of children to move autonomously in their neighborhoods is related to age and gender (Moore, 1986; Prezza et al., 2001; Veitch et al., 2006; Tremblay et al., 2015; Wolfe & McDonald, 2016). Using semi-structured interviews of mothers, Prezza et al. (2001) found that older children and boys had more independence in moving around their neighborhood. Perceptions of safety, having a courtyard (for apartment dwellers), and having parks were also key factors. Veitch et al. (2006) found that parents of older children (ages 9 to 10) more often reported that they allowed their children to play away from home (in a park or friend's house) compared to parents of younger children (ages 6 to 8). They also reported that 70 percent of parents of primary age children restricted the mobility of their children and did not allow them to ride bicycles and visits parks without adult supervision. The researchers also

noted that young children are dependent on their parents to take them to parks and other play areas. Wolfe and McDonald (2016) surveyed 305 parents of children ages 10 to 14 and found a significant and positive association between children's age and level of independent mobility. They observed a distinct trend in mobility as children advanced to each age group. The researchers also observed a significant age-sex interaction. Girls age 12 were associated with lower odds of independent mobility compared to other age-sex interactions.

Overall, past research presents strong justification for examining gender as well as age differences in relation to parental attitudes toward their children's outdoor unstructured active play. Based on the review of literature, there is sufficient evidence to expect that associations among parental attitudes toward nature and children's outdoor play will vary by gender of parent and children and children's age.

Summary

The purpose of this study was to examine how parental attitudes toward nature and toward outdoor unstructured active play activities relate to their children's interest and involvement in the outdoors. The study was informed by leisure socialization, environmental socialization, gender role theory, age and developmental influences, all of which provide perspective on parents' roles in their children's development. The literatures related to these perspectives provide a basis for considering these constructs. Leisure socialization is a well-established concept in the leisure studies literature. It supports the notion that parental influences are critical to understanding children's outdoor activity. Similarly, environmental socialization studies show that parents contribute to their children's interest in outdoor activities and that these interests can be predictors of outdoor play and independent mobility. The gender studies literature showed that socialization experiences are shaped by the gender of the parent and of the

child. Studies of age and developmental highlight the influences of parenting strategies and increasing autonomy of children that impact children's play and activity as children age.

The purpose of this study was to examine parental attitudes toward nature and how those attitudes are associated with children's outdoor unstructured active play. Thus, the following four objectives were addressed in the study:

1. Describe parental attitudes toward nature and outdoor unstructured active play.
2. Describe parental attitudes toward their children's participation in outdoor unstructured active play.
3. Examine the association among parental attitudes toward nature and their attitudes toward their children's outdoor unstructured play and their children's participation in outdoor active play.
4. Determine whether associations between parental attitudes toward nature and their children's outdoor unstructured active play participation vary by gender and age.

Participation in outdoor activities encompassed two dependent variables: the number of days children spend in outdoor unstructured play during the week and children's independent mobility.

Methods

The following sections describe the methods and procedures used to address the objectives of this study. The population and sample, survey methods, measures and a description of data analysis methods are presented.

Population and Sample

The population for this study was parents with one or more children between 6 and 14 years old. Justification for this age range comes from Eccles (1999) who described this age range an important developmental period when "children's sense of identity" is established (Eccles, 1999, p. 30). Studies also show that during these ages family environments offer opportunities for development of children's personal autonomy (Eccles, 1999).

The sample for this study was obtained using a panel maintained by Qualtrics. The panel consists of adults with one or more children between the ages 6 and 14. Study participants were randomly selected from the panel which allows the study results to be generalized to a greater degree than in earlier studies (e.g., McFarland et al. 2014). According to Qualtrics, it is the world's leading survey technology company and has been providing online samples for over five years. Qualtrics has completed over 15,000 projects across various industries, including travel, financial services, healthcare, retail, consumer goods, technology, and manufacturing both in the US and globally. Qualtrics survey panels are built from random selection of potential participants most likely to qualify for particular survey topics. Certain exclusions also take place, such as category exclusions and participation frequency. Each sample that Qualtrics provides is proportioned to the general population and then randomized before the survey is launched. The respondents joined panels through one of three different processes, including a double opt-in process, recruitment, or voluntary sign-up. To screen respondents to ensure data quality, respondents are sent a couple of refinement questions to help verify their qualifications for the panel. Survey samples from Qualtrics have been used in previous peer-reviewed studies in leisure and recreation research (e.g., Roberts, Knight, Ray & Saelens, 2016; Taylor, Ward, Zabriski, Hill and Hanson, 2012).

Data Collection

An online survey and questionnaire was used for data collection. Data collection occurred between March 17 and March 26, 2016. Online data collection benefitted this study in three ways. It was easy to set-up and did not require extensive formatting; it was cost effective relative to a mail and telephone survey; and it was efficient since Qualtrics administered the survey and the data were immediately entered into a database. Online surveys also have limitations. In general, online surveys seldom provide scientifically valid or accurate data particularly when convenience samples are used or when a population cannot be defined (Duda & Nobile, 2010). However, this study avoided these limitations by utilizing a random sample from Qualtrics.

Survey quality was evaluated through a "soft launch." This involved launching the survey to 10% of the sample to check for missing information or other potential problems with the questionnaire. In an additional check for survey quality, the questionnaire was piloted using Amazon's Mechanical Turk (AMT) on a sample of 60 parents meeting the study criteria (i.e., parents of children age 6 to 14). AMT is a crowdsourcing internet marketplace. According to AMT, its service is becoming an increasingly popular way for researchers to conduct online experiments and to gather needed information. Anyone with access to the Internet can use AMT services as a way to draw specific respondents for a web-based survey. Additionally, AMT is a low cost way to effectively engage a diverse set of respondents in a short and reasonable amount of time.

Following a review of the soft launch data and the data from AMT the questionnaire was administered to the remainder of the sample.

Questionnaire and Measures

The questionnaire addressed parental attitudes toward nature, parental attitudes toward their children's participation in outdoor recreation, number of days children spend in outdoor unstructured play during the week, and the distance parents allow their children to play away from home, and general demographics.

To address the research objectives, it was necessary to measure parental attitudes toward nature, their attitudes toward their children's outdoor activity, and children's outdoor activity. McFarland, Hammond, Zajicek and Waliczek's (2011) measures of parental attitudes toward nature (PAN) and parent attitudes toward their child's outdoor nature play (PACOR) were used to address objectives 1 and 2. McFarland's et al. (2011) PAN instrument included 15 questions pertaining to the attitudes parents have toward nature and the PACOR scale included 28 statements relating to their attitude toward their children spending time outdoors. The questions were adapted from previous studies about attitudes toward nature and children's outdoor activities (Ennis, 2003; McMillan, 2003; Murphy 1984; Piotrowski, 2007; Timperio et al., 2004; Weir et al., 2006). The questions directed parents to respond on a six-point Likert-type scale. Example statements from the PAN scale include: "I really enjoy nature," "I wish I knew more about nature," "Spending time outdoors is an enjoyable alternative to watching television," and "Walking in the woods is a waste of time." Some statements included in the PACOR scale were: "playing outside encouraged too much aggressive behavior," "all playgrounds should contain natural element," "I think my child should go on nature hikes," "my child gets to dirty when playing outside," and "taking part in outdoor recreation improves my child's communication skills" (McFarland et al., 2011). Negatively worded statements in the PAN and PACOR scales were reverse coded for subsequent data analysis. Individual survey items from each scale (PAN

and PACOR) were summed to create a PAN and PACOR score. The PAN scale score had a possible range of 21 through 126 and the PACOR scale score had a possible range of 29 through 174.

Higher scores on both the PAN and PACOR scales indicate a more positive view of parental attitudes toward nature and their attitudes toward their child's outdoor unstructured play (Hammond et al., 2011). Because of skewed distributions in the PAN and PACOR item responses, the variables were recoded to create dichotomous measures (i.e., High and Low). Using descriptive statistics, the 25th, 50th, and 75th percentiles for PAN and PACOR scores were identified. The 25th percentile score for PAN and PACOR was 74 and 132, respectively. For PAN, low scores were 74 and below and high scores were 75 and above; for PACOR, low scores were 132 and below, and high scores were 133 and above. The 25th percentile cut point was used to create greater separation and variability given the overall positive responses to the PAN and PACOR scales.

Dependent Variables

Two dependent variables in this study were measured for this study: (1) number of days children spend in outdoor unstructured play, and (2) independent mobility. Number of days children spend in outdoor play was measured using the physical activity section of the "Active Where? Survey" designed by Kerr, Sallis, Rosenberg, Norman, Saelens and Durant (2008). Two questions asked how many days during the course of a week the parent's child spends outdoors in physical activity. Outdoor physical activity was described to the participant as any activity that increases your child's heart rate and makes your child get out of breath some of the time. Outdoor activity can be both structured and unstructured activities, such as sports, playing with friends, or walking to school. Other examples of physical activity are running, climbing, brisk

walking, biking, swimming, soccer, basketball, or football. The specific questions were: (1) "for the past seven days, how many days was your child physically active outdoors for a total of at least 60 minutes per day?" and (2) "over a typical or usual week, on how many days is your child physically active outdoors for a total of at least 60 minutes per day?" Two subsequent questions adapted for this study were: (1) "for the past seven days, how many days was your child physically active outdoors in unstructured play for a total of at least 60 minutes per day?" and (2) "over a typical or usual week, on how many days is your child physically active outdoors in unstructured play for a total of at least 60 minutes per day?" The dependent variables were recoded into dichotomous variables (i.e., High and Low). The low scores were 1-2 days and high scores were 3 days and above (i.e., most days of the week) for the number of days children spend in outdoor active play. According to the Centers for Disease Control and Prevention (2015), children should at least accumulate three days of 60 or more minutes of physical activity during the week.

Independent mobility was measured by items adapted from a previous study in which parents were asked about the frequency their children were allowed to play away from home alone or with friends (Prezza, Pilloni, Morabito, Sersante, Alparone, & Giuliani, 2001). Prezza et al. (2001) asked about children's autonomy in relation to travel to school, running errands, and playing outside on their own. For this research, four questions were adapted to measure children's independent mobility: (1) "How often does your child go alone or with peers to and from school?"; (2) "How often does your child go alone to play in a playground or park near your home?"; (3) "How often does your child go alone to play in a backyard or private street near your home?"; and (4) "How frequently does your child go out alone on small errands to make purchases during the day?" Possible responses from participants included: "never",

"sometimes", or "often." The scores were recoded into dichotomous variables (i.e., High and Low). Low scores were when respondents answered "never" and high scores were respondents answered "sometimes," or "often" for the independent mobility questions.

Gender was measured in two ways. Parents indicated their gender and the gender of their child with the most recent birthday. In the statistical analysis, males were coded as = 0 and females were coded as = 1. Parents in the survey provided information on children age 6 to 14. For the analysis, age of children was measured by a dichotomous variable with children 6 to 10 categorized as young children and children age 11 to 14 as categorized as older children. The parent gender and child gender variables were used to create an interaction term used in the regression analyses.

Two demographic control variables measured for this study were parent educational attainment and place of residence. Education was measured by a question that asked respondents to indicate the highest level of education they received. Education was recoded into a dichotomous variable: categories of respondents with a college degree (bachelor's degree or higher) and without a college degree (i.e., associate's degree or below). Place of residence was measured using the following categories: (1) Urban (generally inside a city or urbanized area with a population greater than 100,000); (2) Small Urban/Suburban (generally a city or urban area outside a principal city with a population less than 100,000); (3) Rural Fringe (generally inside a town or rural area that is within 10 miles from an urban area); and (4) Rural Distant (inside a town or rural area more than 10 miles from the nearest urban area). Place of residence was recoded into dichotomous variable: rural and urban. The rural categories were collapsed to form one rural level; the urban categories were collapsed to form one urban category.

Analysis

All study variables were summarized by calculating descriptive statistics, including frequencies, means and standard deviations. Specifically, descriptive statistics were used to describe parent attitudes toward nature (Objective 1) and parent attitudes toward their children's participation in outdoor unstructured play (Objective 2). Tests for associations between parental attitudes toward nature and toward children's outdoor unstructured play were conducted using crosstabs and chi-square tests for association. Chi-square analysis assessed the relationship between PAN and PACOR scores and the four measures of children's outdoor play as well as independent mobility (Objective 3). Logistic regression analysis was used to determine the effect of gender and age on associations between PAN and PACOR scores and outdoor active play. Parent educational attainment and place of residence were included in multivariable models as control variables (Objective 4).

Pre-tests and reliability

Key measures in the study (i.e., PAN, PACOR, outdoor play) were adapted from previous studies. Thus, it was important to test their reliability. The questionnaire was tested with 44 respondents provided by Qualtrics prior to launching the larger survey. The Qualtrics soft launch results indicated no gaps or missing data. A second pre-test was conducted using Amazon Mechanical Turk. The survey was distributed to a convenience sample of 60 parents with one or more children between the ages of 6 to 14. Results showed no missing data or other problems with the questionnaire. Cronbach's alpha reliability for PAN and PACOR items was calculated from the Qualtrics and Amazon Mechanical Turk soft launch data to ensure that each measure had sufficient internal consistency. The Qualtrics PAN scale items yielded a high reliability (α= .867). The PACOR items also yielded good reliability ($\alpha = .812$). The AMT PAN scale items

yielded good reliability as well (α = .867). The PACOR items yielded lower but acceptable reliability (α = .661). A Cronbach's alpha for PAN and PACOR calculated with the full sample was higher than results from the soft launch. The full sample PAN measures yielded high reliability (α = .907). The PACOR measures also yielded high reliability (α = .907).

Cronbach's alpha was also calculated for the dependent variable measures. Measures of outdoor activity adapted from Kerr et al. (2008) tested with Qualtrics pre-launch survey yielded a high reliability (α = .956). The AMT results also exhibited high reliability (α = .952). Lastly, the Qualtrics independent mobility measures exhibited good reliability (α = .859). The AMT results revealed lower but acceptable reliability (α = .638) for independent mobility measures. Overall, the pre-test results demonstrate consistency and reliability in the measures across the two independent samples. A Cronbach's alpha for outdoor play and independent mobility was calculated with the full sample was higher than results from the soft launch. The full sample outdoor play measures yielded high reliability (α = .942). The independent mobility measures also yielded high reliability (α = .731).

Results

Participants

The survey yielded 407 completed questionnaires from parents who met the study criteria. The demographic characteristics of the study participants are presented in Table 1. Of the 407 respondents, 205 (50.4%) were female and 202 (49.6%) were male. The parents reported 221 (54.3%) male children and 186 (45.7%) female children. In line with the study criteria, children's ages ranged from 6 to 14 years old, with a mean age of 9 (S.D. =2.476). Parents ages ranged from 22 to 64, with a mean of 38 (S.D. = 8.740). Respondents were primarily

White/Caucasian, (n=333, 81.8%), while 31 (7.6%) identified as Hispanic/Latino, and 24 (5.9%) identified as Black/African American. Respondents were also asked to indicate their educational attainment. Eighty-nine (21.9%) graduated high school, 99 (24.3%) reported some college credit, and 83 (20.4%) reported a Bachelor's degree. Of the 407 respondents, 294 (72.2%) were married, followed by 55 (13.5%) who identified as single or never married, 40 (9.8%) were divorced, 10 (2.5%) identified as separated, followed by 8 (2%) who selected widowed.

For place of residence, the largest subgroup was participants from small urban areas and suburbs. Specifically, 174 (42.8%) reported living in small urban/suburban area (a city or urban area outside a principal city with a population less than 100,000), followed by 92 (22.6%) from an urban community (inside a city or urbanized area with a population greater than 100,000), 77 (18.9%) from the rural fringe (inside a town or rural area that is within 10 miles from an urban area), and 64 (15.7%) resided in a rural distant region (inside a town or rural area more than 10 miles from the nearest urban area).

Table 1. *Demographic Characteristics of Study Participants (N = 407)*

Characteristics	n	%
Participant Gender		
Men	202	49.6
Women	205	50.4
TOTAL	407	100%
Gender of Children		
Male Child	221	54.3
Female Child	186	45.7
TOTAL	407	100%
Age of Children		
6 Years Old	68	16.7
7 Years Old	54	13.3
8 Years Old	45	11.1
9 Years Old	51	12.5

Table 1. *(continued)*

10 Years Old	49	12
11 Years Old	46	11.3
12 Years Old	37	9.1
13 Years Old	36	8.8
14 Years Old	21	5.2
TOTAL	407	100%
Participant Race/Ethnicity		
American Indian or Alaskan Native	2	0.5
Asian	10	2.5
Black or African American	24	5.9
Hispanic or Latino	31	7.6
Native Hawaiian or Pacific Islander	1	0.2
White	333	81.8
Choose not to respond	6	1.5
TOTAL	407	100%
Participant Education		
No Schooling	9	2.2
Nursery to 8th Grade	1	0.2
High School Graduate	89	21.9
Some College Credit	99	24.3
Trade/Technical	25	6.1
Associate's Degree	54	13.3
Bachelor's Degree	83	20.4
Master's Degree	33	8.1
Professional Degree	6	1.5
Doctorate Degree	8	2.0
TOTAL	407	100%
Single or Never Married	55	13.5
Married or Domestic Partnership	294	72.2
Widowed	8	2
Divorced	40	9.8
Separated	10	2.5
TOTAL	407	100%

Table 1. *(continued)*

Participant Place of Residence		
Urban	92	22.6
Small Urban/Suburban	174	42.8
Rural Fringe	77	18.9
Rural Distant	64	15.7
TOTAL	407	100%

Descriptive Statistics

The first two objectives of the study were to describe parental attitudes toward nature (PAN) and outdoor unstructured play, and to describe parental attitudes toward their children's participation in outdoor unstructured play (PACOR).

Parental Attitudes

Descriptive statistics for PAN measures are presented in Table 2 and PACOR measures are presented in Table 3. The mean score for the PAN scale was 78.85 (S.D. = 9.9) and the per question mean was 5.25. The mean score for PACOR scale was 142 (S.D. = 17.54), and the per question mean was 5.10. The PAN scale scores ranged from 26 to 90 and the PACOR scale scores ranged from 83 to 168. Higher scores indicate a more favorable attitude toward nature and outdoor unstructured play. The PAN and PACOR scores, with the per question mean are represented in Table 4. Overall, the PAN and PACOR results indicate that the majority of respondents answered most statements as either "somewhat agree," or "strongly agree." The frequency analysis and mean PAN and PACOR scores indicate that most respondents hold favorable attitudes toward nature, as well as their child's outdoor unstructured play.

Table 2. *Descriptive Statistics for PAN items*

Survey Item	Strongly disagree	Somewhat disagree	Slightly disagree	Slightly agree	Somewhat agree	Strongly agree	Mean	Standard Deviation
Enjoy nature	4 [a] (1.0)	4 (1.0)	4 (1.0)	44 (10.8)	99 (24.3)	252 (61.9)	5.42	.914
Enjoy night sky	2 (0.5)	3 (0.7)	7 (1.7)	41 (10.1)	111 (27.3)	243 (59.7)	5.42	.858
Enjoy pictures of animals	4 (1.0)	8 (2.0)	13 (3.2)	91 (22.4)	134 (32.9)	157 (38.6)	5	1.04
Like sitting by a pond	6 (1.5)	3 (0.7)	11 (2.7)	67 (16.5)	111 (27.3)	209 (51.4)	5.21	1.02
Walking in woods is wasteful	242 (59.5)	82 (20.1)	36 (8.8)	15 (3.7)	14 (3.4)	18 (4.4)	1.85	1.35
Wish I knew more about nature	8 (2.0)	12 (2.9)	29 (7.1)	110 (27)	138 (33.9)	110 (27.)	4.69	1.15
People should spend time outdoors	1 (0.2)	4 (1.0)	3 (0.7)	27 (6.6)	91 (22.4)	281 (69.)	5.57	.768
Like nature TV programs	6 (1.5)	21 (5.2)	22 (5.4)	102 (25.1)	122 (30.)	134 (32.9)	4.76	1.20
Like to vacation in a cabin	8 (2.0)	9 (2.2)	18 (4.4)	37 (9.1)	103 (25.3)	232 (57.0)	5.25	1.14
Feel good close to nature	1 (0.2)	3 (0.7)	11 (2.7)	53 (13.)	116 (28.5)	223 (54.8)	5.33	.885

Table 2. *(continued)*

Like the sound of a stream	1 (0.2)	2 (0.5)	4 (1.0)	26 (6.4)	88 (21.6)	286 (70.3)	5.59	.733
Like walking through leaves	2 (0.5)	3 (0.7)	13 (3.2)	55 (13.5)	113 (27.8)	221 (54.3)	5.30	.928
Time outdoors is a good alternative to TV	2 (0.5)	7 (1.7)	10 (2.5)	37 (9.1)	105 (25.8)	246 (60.4)	5.39	.935
Outdoor family vacations are a good opportunity	0	5 (1.2)	4 (1.0)	29 (7.1)	82 (20.1)	287 (70.5)	5.58	.771
Enjoy eating outside	5 (1.2)	15 (3.7)	16 (3.9)	47 (11.5)	147 (36.1)	177 (43.5)	5.08	1.11

[a] Frequency (numbers in parentheses represent the percentage of respondents)

Table 3. *Descriptive Statistics for PACOR Items*

Survey Item	Strongly disagree	Somewhat disagree	Slightly disagree	Slightly agree	Somewhat agree	Strongly agree	Mean	Standard Deviation
Playing outdoors encourages aggressiveness	280 [a] (68.8)	66 (16.2)	21 (5.2)	7 (1.7)	13 (3.2)	20 (4.9)	1.69	1.34
Playgrounds should contain natural elements	4 (1.0)	13 (3.2)	20 (4.9)	98 (24.1)	148 (36.4)	124 (30.5)	4.83	1.077

Table 3. *(continued)*

Playing outside is good for child's health	2 (0.5)	1 (0.2)	0	15 (3.7)	64 (15.7)	325 (79.9)	5.73	.630
Too much crime outside	141 (34.6)	90 (22.1)	67 (16.5)	45 (11.1)	44 (10.8)	20 (4.9)	2.56	1.54
Child should go on Nature Hikes	4 (1.0)	4 (1.0)	13 (3.2)	54 (13.3)	132 (32.4)	200 (49.1)	5.23	.974
Playing outside is Wasteful	317 (77.9)	40 (9.8)	9 (2.2)	7 (1.7)	17 (4.2)	17 (4.2)	1.57	1.32
Neighborhood is safe for child to play	9 (2.2)	12 (2.9)	23 (5.7)	49 (12.)	130 (31.9)	184 (45.2)	5.04	1.91
Let child walk in the rain	17 (4.2)	15 (3.7)	15 (3.7)	73 (17.9)	119 (29.2)	168 (41.3)	4.88	1.31
Child gets too dirty outside	150 (36.9)	103 (25.3)	50 (12.3)	54 (13.3)	23 (5.7)	27 (6.6)	2.45	1.55
Afraid child will be harmed by strangers	78 (19.2)	66 (16.2)	45 (11.1)	112 (27.5)	68 (16.7)	38 (9.3)	3.34	1.61
Time outdoors is meaningful for family	2 (0.5)	5 (1.2)	2 (0.5)	27 (6.6)	85 (20.9)	286 (70.3)	5.57	.809
Worried child will be harmed by gangs	222 (54.5)	73 (17.9)	39 (9.6)	35 (8.6)	22 (5.4)	16 (3.9)	2.04	1.45
Child's learning is stimulated by outdoors	3 (0.7)	3 (0.7)	9 (2.2)	32 (7.9)	95 (23.3)	265 (65.1)	5.48	.882

Table 3. *(continued)*

Playing outdoors hurts child's grades	306 (75.2)	50 (12.3)	18 (4.4)	8 (2.0)	10 (2.5)	15 (3.7)	1.55	1.22
Outdoors improves hand-eye coordination	2 (0.5)	1 (0.2)	7 (1.7)	27 (6.6)	118 (29.)	252 (61.9)	5.49	.784
Other children are safe for child to play around	5 (1.2)	6 (1.5)	21 (5.2)	48 (11.8)	148 (36.4)	179 (44)	5.13	1.04
Children who play outdoors gain confidence	0	3 (0.7)	6 (1.5)	43 (10.6)	126 (31.)	229 (56.3)	5.41	.794
Allow child to have wide range of recreation activities	4 (1.0)	5 (1.2)	6 (1.5)	53 (13)	114 (28.)	225 (55.3)	5.32	.955
Outdoor play interferes with child's homework	227 (55.8)	84 (20.6)	41 (10.1)	26 (6.4)	13 (3.2)	16 (3.9)	1.92	1.35
Child is manageable after playing outdoors	5 (1.2)	11 (2.7)	19 (4.7)	90 (22.1)	150 (36.9)	132 (32.4)	4.88	1.08
Afraid child will be abducted	104 (25.6)	86 (21.1)	43 (10.6)	99 (24.3)	41 (10.1)	34 (8.4)	2.97	1.62
Let child make mud pies	39 (9.6)	18 (4.4)	29 (7.1)	69 (17.)	92 (22.6)	160 (39.3)	4.57	1.61

Table 3. *(continued)*

Outdoor play improves child's communication	4 (1.0)	2 (0.5)	13 (3.2)	69 (17.)	117 (28.7)	202 (49.6)	5.21	.977
Outdoor activities overstimulate child	203 (49.9)	91 (22.4)	35 (8.6)	45 (11.1)	33 (8.1)	0	2.05	1.33
Outdoor activities builds child's independence	2 (0.5)	0	5 (1.2)	49 (12.)	118 (29.)	233 (57.2)	5.41	.810
Let child play in sandbox	9 (2.2)	5 (1.2)	11 (2.7)	19 (4.7)	84 (20.6)	279 (68.6)	5.46	1.05
Outdoors a good way for child to make friends	2 (0.5)	4 (1.0)	5 (1.2)	26 (6.4)	95 (23.3)	275 (67.6)	5.54	.817
Outdoor play is a good way for child to exercise	2 (0.5)	0	4 (1.0)	18 (4.4)	37 (9.1)	346 (85.)	5.77	.652

[a] Frequency (numbers in parentheses represent the percentage of respondents)

Table 4. *Descriptive Statistics for Combined PAN and PACOR Score*

Measure	Minimum Score	Maximum Score	Mean Score	Standard Deviation	Per Question Mean
PAN	26	90	78.75	9.9	5.25
PACOR	83	168	142.76	17.54	5.10

After recoding the PAN and PACOR items, 73.7% (n=300) of the respondents were categorized as high PAN scores, compared to 26.3% (n=107) with low scores. For the PACOR scores, 74.9% (n=305) of the respondents had high PACOR scores compared to 25.1% (n=102) with low scores.

Dependent Variables

Two dependent variables in the study were amount of time children spend in outdoor unstructured play and independent mobility. Table 5 presents the descriptive statistics for both variables.

For the first measure, the mean number of days a child participated in outdoor play during the past seven days was 4.35 days. When recoded, 82.3% of parents reported their children were active 3 or more days during the past seven days. The mean number of days a child participated in outdoor play during a typical week was 4.49 days. When recoded 84% of parents reported their children were active 3 or more days during a typical week. The mean for the third measure, number of days a child participated in outdoor unstructured play was 3.98 days. When recoded, 73.5% of parents indicated their children were active in unstructured play 3 or more days during the past seven days. Lastly, the mean number of days a child participated in outdoor unstructured play in a typical week was 4.13 days. When recoded, 76.7% of parents indicated their children were active in unstructured play 3 or more days during a typical week.

Table 5. *Descriptive Statistics for Children's Outdoor Play (Frequency, %, Mean, Standard Deviation)*

Survey Item	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	Mean (number of days)	Standard Deviation
Past Seven Days Physical Activity	28 [a] (6.9)	44 (10.8)	67 (16.5)	65 (16.)	95 (23.3)	39 (9.6)	69 (17.0)	4.35	1.80
Typical Week Physical Activity	29 (7.1)	36 (8.8)	51 (12.5)	74 (18.2)	96 (23.6)	51 (12.5)	70 (17.2)	4.49	1.78
Past Seven Days Unstructured Physical Activity	49 (12.0)	59 (14.5)	69 (17.0)	54 (13.3)	79 (19.4)	44 (10.8)	53 (13.0)	3.98	1.91
Typical Week Unstructured Physical Activity	41 (10.1)	54 (13.3)	62 (15.2)	60 (14.7)	93 (22.9)	37 (9.1)	60 (14.7)	4.13	1.87

[a] Frequency (numbers in parentheses represent the percentage of respondents)

Table 6 shows the frequency, percentage, mean and standard deviation for the four independent mobility measures. The independent mobility questions asked participants how often their child goes to school, to a park or playground, backyard or street alone, or if they run errands during the day alone. Most parents reported that their children never go to school or to a park or playground alone. For example, 59.2% reported never letting their child go to school alone. When recoded, 59.2% responded never letting their child go to school alone. 64.6% indicated never letting their child go to a park or playground alone. Only 7.1% responded with always letting their child go to the park or playground alone. When recoded, 64.6% responded to

never letting their child go to a park or playground alone. For the third measure, letting their child go into the backyard or street alone to play, 154 (37.8%) responded with always letting their child go in the backyard or street alone to play, 139 (34.2%) responded with sometimes allowing their child to play in a backyard or street alone, and 114 (28%) indicated never letting their child go alone to play in a backyard or street alone. When recoded, 28% responded never letting their child play in the backyard alone, with 72% responding sometimes or always. Lastly, 305 respondents (74.9%) reported that their child never goes on errands during the day, 80 (19.7%) indicated they sometimes let their child go on errands during the day, and 22 (5.7%) always let their child go on errands during the day. When recoded, 74.9% responded to never letting their child go on errands alone during the day, while 25.1% responded sometimes or always.

Table 6. *Descriptive Statistics for Independent Mobility (Frequency, %, Mean, Standard Deviation)*

Survey Item	Never	Sometimes	Always	Mean	Standard Deviation
Child Goes to School Alone	241 [a] (59.2)	106 (26.0)	60 (14.7)	1.56	0.74
Child Goes to Park or Playground Alone	263 (64.6)	115 (28.3)	29 (7.1)	1.43	0.62
Child Goes to Backyard or Street Alone	114 (28.0)	139 (34.2)	154 (37.8)	2.10	0.81
How frequently does your child go on errands during the day	305 (74.9)	80 (19.7)	22 (5.4)	1.30	0.57

[a] Frequency (numbers in parentheses represent the percentage of respondents)

Chi-Square Test

The third objective of this study was to determine the association among parental attitudes towards nature, their attitudes toward their child's outdoor active play, and their child's participation in outdoor active play.

Children's Outdoor Active Play Variables

Table 7 presents tests for associations involving outdoor active play for the past seven days. There was no statistical association between PAN and outdoor active play for the past seven days, and there was no statistical association between PACOR and outdoor active play for the past seven days. Table 8 presents the chi-square results for outdoor active play for a typical week. There was a positive and significant association observed between the PAN score and outdoor active play during a typical week ($X^2 = 5.91$, p = .015, Cramer's V = .12). Compared to parents with low PAN scores, a greater percentage of parents with high PAN scores reported their children were active three or more days during a typical week. In addition, there was a positive and significant association observed between PACOR and outdoor active play during a typical week ($X^2 = 5.80$, $p = .02$, Cramer's V = .12). Parents with high PACOR scores were more likely to report that their child was active three or more days during a typical week. There was no statistical association between PAN and unstructured outdoor active play for the past seven days, and there was no statistical association between PACOR and unstructured outdoor active play for the past seven days (Table 9). Table 10 presents tests for association involving unstructured outdoor active play for a typical week. There were no significant associations observed for PAN scores or PACOR scores.

Independent Mobility Variables

Chi-square tests were also used to assess the association among parental attitudes toward nature, their attitudes toward their child's outdoor play, and their child's independent mobility (Table 11-14). The analyses revealed three statistically significant associations. The PAN score and extent parents let their children play alone in a backyard or private street exhibited a significant and positive association ($X^2 = 4.05$, $p = .044$, Cramer's V= .10). There was also a positive and significant relationship between the PACOR score and the extent parents let their children play alone in a backyard or private street ($X^2 = 5.77$, $p = .016$, Cramer's V= .12). Both of these significant findings demonstrated that when parents had high PAN scores and PACOR scores, a greater percentage of them reported their child playing alone in a backyard or private street. Lastly, there was a significant association between the PACOR score and parents letting their children go on errands alone ($X^2 = 10.78$, $p = .001$, Cramer's V= .16). When parents had high PACOR scores, a greater percentage of them reported their child going on errands alone during the day.

Results for tests of associations involving independent mobility are shown in Tables 11 to 14. Chi-square tests indicated significant associations with the independent mobility variables and gender. There was a significant and positive association between the gender of the parent ($X^2 = 19.01$, $p < .001$, Cramer's V= .212) and child's age ($X^2 = 40.30$, $p < .001$, Cramer's V= .32) and the extent parents let their child go to school alone. A significant and positive association was observed between gender of the child ($X^2 = 4.17$, $p = .041$, Cramer's V= .10) and child's age ($X^2 = 19.95$, $p < .001$, Cramer's V= .22) and the extent parents let their child go to the park alone. Additionally, a significant association was observed between child's age ($X^2 = 8.06$, $p = .005$, Cramer's V= .14) and the extent parents let their child go to the backyard alone. Lastly,

there were significant findings between the extent parents let their child go on errands alone during the day and the child's age ($X^2 = 20.74$, $p < .001$, Cramer's V= .23). Overall, the results indicated that boys and older children (age 10 to 14) were more likely to have greater independent mobility.

Table 7. *Factors Associated with Outdoor Active Play for the Past Seven Days*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	p	Cramer's V
Parent Gender						
Male	202	15.3	84.7	1.51	.219	0.06
Female	205	20.0	80.0			
Child Gender						
Male	221	15.8	84.2	1.14	.285	0.05
Female	186	19.9	80.1			
Child's Age						
6-10	267	18.4	81.6	.23	.629	0.02
11-14	140	16.4	83.6			
Residency						
Rural	266	14.9	85.1	1.16	.282	0.05
Urban	141	19.2	80.8			
Education						
Associate Degree and below	277	15.9	84.1	1.94	.163	0.07
Bachelor's and Above	130	21.5	78.5			

Table 7. *(continued)*

PAN						
Low Score	107	26.2	73.8	7.17	.007	0.13
High Score	300	14.7	85.3			
PACOR						
Low	102	28.4	71.6	10.78	.001	0.16
High	305	14.1	85.9			

Table 8. *Factors Associated with Outdoor Active Play for a Typical Week*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	16.3	83.7	.04	.841	0.01
Female	205	15.6	84.4			
Child Gender						
Male	221	14.5	85.5	.80	.371	0.04
Female	186	17.7	82.3			
Child's Age						
6-10	267	15.0	85.0	.57	.452	0.04
11-14	140	17.9	82.1			
Residency						
Rural	266	13.5	86.5	1.00	.317	0.05
Urban	141	17.3	82.7			

Table 8. *(continued)*

Education						
Associate Degree and below	277	11.9	88.1	10.64	.001	0.16
Bachelor's and Above	130	24.6	75.4			
PAN						
Low	107	23.4	76.6	5.91	.015	0.12
High	300	13.3	86.7			
PACOR						
Low	102	23.5	76.5	5.80	.02	.12
High	305	13.4	86.6			

Table 9. *Factors Associated with Outdoor Unstructured Active Play for the Past Seven Days*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	22.8	77.2	2.91	.088	0.06
Female	205	30.2	69.8			
Child Gender						
Male	221	24.0	76.0	1.62	.203	0.06
Female	186	29.6	70.4			

Table 9. *(continued)*

Child's Age						
6-10	267	26.2	73.8	.04	.814	0.01
11-14	140	27.1	72.9			
Residency						
Rural	266	22.0	78.0	2.30	.130	0.08
Urban	141	28.9	71.1			
Education						
Associate Degree and below	227	23.1	76.9	5.23	.022	0.11
Bachelor's and Above	130	33.8	66.2			
PAN						
Low	107	31.8	68.2	2.05	.153	0.07
High	300	24.7	75.3			
PACOR						
Low	102	29.4	70.6	.58	.447	0.04
High	305	25.6	74.4			

Table 10. *Factors Associated with Outdoor Unstructured Active Play for a Typical Week*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	22.8	77.2	.07	.788	0.01
Female	205	23.9	76.1			
Child Gender						
Male	221	22.6	77.4	.14	.709	0.02
Female	186	24.2	75.8			
Child's Age						
6-10	267	20.6	79.4	3.26	.071	0.09
11-14	140	28.6	71.4			
Residency						
Rural	266	17.7	82.3	3.80	.051	0.10
Urban	141	26.3	73.7			
Education						
Associate Degree and below	227	18.8	81.2	10.12	.001	0.16
Bachelor's and Above	130	33.1	66.9			
PAN						
Low	107	29.0	71.0	2.57	.109	0.08
High	300	21.3	78.7			

Table 10. *(continued)*

PACOR						
Low	102	29.4	70.6	2.80	.094	0.08
High	305	21.3	78.7			

Table 11. *Factors Associated with Children Going to School Alone*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	48.5	51.5	19.01	.000	0.22
Female	205	69.8	30.2			
Child Gender						
Male	221	54.3	45.7	4.84	.028	0.11
Female	186	65.1	34.9			
Child's Age						
6-10	267	70.4	29.6	40.30	.000	0.32
11-14	140	37.9	62.1			
Residency						
Rural	266	61.7	38.3	.55	.457	0.04
Urban	141	57.9	42.1			

Table 11. *(continued)*

Education						
Associate Degree and below	277	58.8	41.2	.05	.825	0.01
Bachelor's and Above	130	60.0	40.0			
PAN						
Low	107	63.6	36.4	1.13	.288	0.05
High	300	57.7	42.3			
PACOR						
Low	102	60.8	39.2	.14	.709	0.02
High	305	58.7	41.3			

Table 12. *Factors Associated with Children Going to the Park Alone*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	60.4	39.6	3.13	.077	0.09
Female	205	68.8	31.2			
Child Gender						
Male	221	60.2	39.8	4.17	.041	0.10
Female	186	69.9	30.1			

Table 12. *(continued)*

Child's Age						
6-10	267	72.3	27.7	19.95	.000	0.22
11-14	140	50.0	50.0			
Residency						
Rural	266	69.5	30.5	2.25	.134	0.07
Urban	141	62.0	38.0			
Education						
Associate Degree and below	277	65.3	34.7	.12	.656	0.02
Bachelor's and Above	130	63.1	36.9			
PAN						
Low	107	67.3	32.7	.45	.501	0.03
High	300	63.7	36.3			
PACOR						
Low	102	61.8	38.2	.49	.486	0.04
High	305	65.6	34.4			

Table 13. *Factors Associated with Children Going to the Backyard Alone*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	27.7	72.3	.02	.898	0.01
Female	205	28.3	71.7			
Child Gender						
Male	221	24.4	75.6	3.07	.080	0.09
Female	186	32.3	67.7			
Child's Age						
6-10	267	32.6	67.4	8.06	.005	0.14
11-14	140	19.3	80.7			
Residency						
Rural	266	23.4	76.6	2.27	.132	0.08
Urban	141	30.5	69.5			
Education						
Associate Degree and below	277	29.6	70.4	1.09	.296	0.05
Bachelor's and Above	130	24.6	75.4			
PAN						
Low	107	35.5	64.5	4.05	.044	0.10
High	300	25.3	74.7			

Table 13. *(continued)*

PACOR						
Low	102	37.3	62.7	5.77	.016	0.12
High	305	24.9	75.1			

Table 14. *Factors Associated with Children Going on Errands Alone*

Variables	Count	Low Outdoor Play (%)	High Outdoor Play (%)	X^2	*p*	Cramer's V
Parent Gender						
Male	202	72.8	27.2	1.00	.317	0.05
Female	205	77.1	22.9			
Child Gender						
Male	221	74.2	25.8	.14	.711	0.02
Female	186	75.8	24.2			
Child's Age						
6-10	267	82.0	18.0	20.74	.000	0.23
11-14	140	61.4	38.6			
Residency						
Rural	266	78.0	22.0	1.09	.297	0.05
Urban	141	73.3	26.7			

Table 14. *(continued)*

Education						
Associate Degree and below	277	76.5	23.5	1.18	.278	0.05
Bachelor's and Above	130	71.5	28.5			
PAN						
Low	107	72.0	28.0	0.69	.408	0.04
High	300	76.0	24.0			
PACOR						
Low	102	62.7	37.3	10.78	.001	0.16
High	305	79.0	21.0			

Logistic Regression Results

Logistic regression analysis was used to explore whether associations between parent attitudes toward nature and parent attitudes toward their children's outdoor participation and children's outdoor play vary by gender and age. Using separate regression models, each measure of outdoor unstructured active play and independent mobility was regressed on the PAN scores, as well as PACOR scores, gender of parent and child, child's age, and the interaction of parent and child gender. Each model included controls for parental education attainment and place of residence. The reference categories were as follows: PAN and PACOR were low scores, gender was male, child's age was 6 to 10 years old, residency was urban and education was an Associate's degree or below. To evaluate the adequacy of expected frequencies and statistical

power for logistic regression, expected cell frequencies for all pairs of model variables were evaluated. Tabachnick and Fidell (2007) recommended that all expected frequencies should be greater than 1, and no more than 20% of cells be less than 5. No cell had expected frequencies less than 5.

Results for outdoor active play during a typical week

Table 15 displays logistic regression results for outdoor activity during a typical week. Results indicated that parents with high PAN scores were more likely to report their children were active compared to parents with low PAN scores. High PAN scores were associated with 1.94 greater odds of ($p < 0.01$) of 3 or more days of outdoor active play during a typical week for a child. Child's age, gender, and the interaction of parent and child gender were not associated with outdoor active play, nor was current residency associated with outdoor active play. However, education was negatively associated with outdoor active play. Having a college degree or higher was associated with 59 percent lower odds of 3 or more days of outdoor active play (adjusted O.R. = 0.41, $p < 0.01$) during a typical week. For unstructured outdoor active play (Table 16), PAN scores were not statistically significant. Child's age and parents' education were significantly and negatively associated with unstructured play during a typical week. Older children were associated with 39 percent lower odds (adjusted O.R. = 0.61, $p < 0.05$) of 3 or more days of unstructured play during a typical week. Having a college degree was associated with 54 percent lower odds of children participating in 3 or more days of unstructured play. Gender (parent or child) and the interaction of parent and child gender were not associated with unstructured outdoor active play. Residency was also unrelated too unstructured active play.

Compared to parents with low PACOR scores, parents with high PACOR scores were more likely to report their children were active outdoors for 3 or more days in a typical week

(Table 17). High PACOR scores were associated with 2.17 greater odds ($p < 0.05$) of 3 or more days of outdoor active play during a typical week compared too low PACOR scores. Age, gender, and the interaction of parent and child gender were not associated with unstructured outdoor active play, nor was current residency associated with outdoor active play in a typical week. Higher levels of education were negatively associated with higher outdoor active play during a typical week. Parents with a college degree or higher were associated with 62 percent lower odds (adjusted O.R. = 0.38, $p < 0.01$) of reporting 3 or more days of unstructured outdoor play in a typical week for their children.

PACOR scores were not significantly associated with unstructured outdoor active play during a typical week (Table 18). Age and education were negatively associated with unstructured outdoor active play. In addition, the overall model fit was poor. A test of the full model with all predictors compared to the constant only model was not statistically significant ($X^2 = 3.52$ (8), p = 0.897).

Results for independent mobility variables

Tables 19 to 21 shows regression results for the independent mobility variables. As shown in Table 19, high PAN scores were not associated with greater odds of children playing in a backyard or private street alone. Residency, education, gender, and the interaction of parent and child gender were not associated with children playing in the back yard alone. Age of children was significantly related to being allowed to play in the backyard or private street alone. Older children (ages 11 to 14) were associated with 1.99 greater odds ($p < 0.01$) of playing alone in the backyard or private street (Table 19).

Compared to parents with low PACOR scores, parents with high PACOR scores were more likely to report their children could play alone in the backyard or private street (Table 20). High PACOR scores were associated with 1.65 greater odds ($p < 0.05$) of children playing in a backyard or private street alone. Residency, education, gender and the interaction of parent and child gender were not associated with children playing in the backyard alone. Older children (11 to 14 years of age) were positively associated with 1.99 greater odds ($p < 0.01$) of playing alone in the backyard. High PACOR scores were negatively associated with children going on errands alone during the day (Table 21). High PACOR scores were associated with 58.9% lower odds ($p < 0.01$) of allowing children to go on errands alone. Residency, education, gender and the interaction of parent and child gender were not associated with children going on errands alone. Older children (11 to 14 years of age) were positively associated with 3.01 greater odds ($p < 0.001$) of children going on errands during the day alone.

Overall, parent attitudes toward nature were positively associated with parental reports of children's outdoor active play for a typical week. There were no significant gender effects. Neither parent gender nor child gender was significantly related to children's active play. With regards to age, older children were more likely to be allowed to play alone in the backyard or private street and to run errands alone.

In summary, this study addressed four objectives. The study (1) described parental attitudes toward nature and outdoor unstructured active play; (2) described parental attitudes toward their children's participation in outdoor unstructured active play; (3) examined the association among parental attitudes toward nature and their attitudes toward their children's outdoor unstructured active play and their children's participation in outdoor activities and (4) determined whether associations between parental attitudes toward nature and their children's

outdoor unstructured active play participation vary by gender and age. Overall, parents held favorable attitudes toward nature (PAN) and their children's participation in outdoor activities (PACOR). PAN scores and PACOR scores tended to be positively correlated with parents' reports of children's outdoor active play and unstructured outdoor active play during a typical week. Older age among children was positively associated with children playing in the backyard or private street and ability to run errands alone. Parent's gender was not associated with children's unstructured active play or independent mobility.

Table 15. *Logistic Regression Analysis for Parental Attitudes toward Nature (PAN) and Outdoor Active Play for a Typical Week*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PAN (Ref: Low)	.66 (0.29)	1.94	1.09 – 3.44	.024
Parent Gender (Ref: Male)	.18 (0.40)	1.20	0.54 – 2.64	.656
Child Gender (Ref: Male)	-.08 (0.40)	0.92	0.42 – 2.03	.844
Child's Age (Ref: Age 6-10)	-.25 (0.29)	0.78	0.44 – 1.37	.380
Parent Gender x Child Gender	-.36 (0.57)	0.70	0.23 – 2.14	.530
Residency (Ref: Rural)	-.14 (0.31)	0.87	0.48 – 1.58	.647
Education (Ref: Associates degree or below)	-.90 (0.28)	0.41	0.23 - .71	.001
Adjusted Model Intercept (Constant)	1.80 (0.43)	5.99		

Table 15. *(continued)*

Model Chi-Square (df)	17.75 (7)	.013
Adjusted Model Nagelkerke Pseudo R^2	.07	

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Table 16. *Logistic Regression Analysis for Parental Attitudes toward Nature (PAN) and Outdoor Unstructured Active Play for a Typical Week*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PAN (Ref: Low)	0.35 (0.27)	1.42	0.85 – 2.39	.185
Parent Gender (Ref: Male)	0.18 (0.34)	1.20	0.62 – 2.32	.598
Child Gender (Ref: Male)	0.27 (0.36)	1.35	0.66 – 2.75	.416
Child's Age (Ref: Age 6-10)	-0.50 (0.25)	0.61	0.37 - .99	.044
Parent Gender x Child Gender	-0.74 (0.50)	0.48	0.18 - 1.28	.143
Residency (Ref: Rural)	-0.42 (0.27)	0.66	0.39 – 1.12	.120
Education (Ref: Associates degree or below)	-0.78 (0.25)	0.46	0.28 - 0.75	.002
Adjusted Model Intercept (Constant)	1.68 (0.39)	5.34		
Model Chi-Square (df)			21.06 (7)	.004
Adjusted Model Nagelkerke Pseudo R^2			.08	

Table 16. *(continued)*

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Table 17. *Logistic Regression Analysis for Parental Attitudes toward their Child's Outdoor Recreation (PACOR) and Outdoor Active Play for a Typical Week*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PACOR (Ref: Low)	0.78 (0.30)	2.17	1.20 – 3.93	.011
Parent Gender (Ref: Male)	0.26 (0.40)	1.29	0.59 – 2.85	.526
Child Gender (Ref: Male)	-0.01 (.40)	0.99	0.45 – 2.18	.985
Child's Age (Ref: Age 6-10)	-.25 (0.29)	0.78	0.45 – 1.38	.396
Parent Gender x Child Gender	-0.50 (0.57)	0.61	0.20 – 1.88	.387
Residency (Ref: Rural)	-0.10 (.31)	0.93	0.51 – 1.71	.821
Education (Ref: Associates degree or below)	-0.97 (0.29)	0.38	0.22 - 0.66	.001
Adjusted Model Intercept (Constant)	1.64 (0.45)	5.17		
Model Chi-Square (df)			19.12 (7)	.008
Adjusted Model Nagelkerke Pseudo R^2			.08	

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Table 18. *Logistic Regression Analysis for Parental Attitudes toward their Child's Outdoor Recreation (PACOR) and Outdoor Unstructured Active Play for a Typical Week*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PACOR (Ref: Low)	0.46 (0.27)	1.60	0.93 – 2.71	.090
Parent Gender (Ref: Male)	0.22 (0.34)	1.24	0.64 – 2.42	.519
Child Gender (Ref: Male)	0.34 (0.37)	1.40	0.69 – 2.87	.355
Child's Age (Ref: Age 6-10)	-0.50 (0.25)	0.60	0.37 -0.99	.044
Parent Gender x Child Gender	-0.81 (0.50)	0.44	0.17 – 1.19	.106
Residency (Ref: Rural)	-0.38 (0.27)	0.69	0.40 – 1.17	.167
Education (Ref: Associates degree or below)	-0.82 (0.25)	0.44	0.27 - 0.72	.001
Adjusted Model Intercept (Constant)	1.56 (0.40)	4.75		
Model Chi-Square (df)			3.52 (8)	.897
Adjusted Model Nagelkerke Pseudo R^2			.08	

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Table 19. *Logistic Regression Analysis for Parental Attitudes toward Nature (PAN) and Children Playing in the Backyard Alone*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PAN (Ref: Low)	0.43 (0.25)	1.53	0.94 – 2.49	.086
Parent Gender (Ref: Male)	0.056 (0.32)	1.06	0.60 – 1.99	.866
Child Gender (Ref: Male)	-0.38 (0.33)	0.69	0.36 – 1.31	.252
Child's Age (Ref: Age 6-10)	0.69 (0.25)	1.99	1.21 – 3.27	.007
Parent Gender x Child Gender	0.05 (0.46)	1.05	0.43 – 2.60	.915
Residency (Ref: Rural)	-.33 (0.25)	0.72	0.44 – 1.16	.179
Education (Ref: Associates degree or below)	.29 (0.25)	1.34	0.82 – 2.18	.247
Adjusted Model Intercept (Constant)	0.70 (0.35)	2.01		
Model Chi-Square (df)			4.98 (8)	.760
Adjusted Model Nagelkerke Pseudo R^2			.06	

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Table 20. *Logistic Regression Analysis for Parental Attitudes toward their Child's Outdoor Recreation (PACOR) and Children Playing in the Backyard Alone*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PACOR (Ref: Low)	0.50 (0.25)	1.65	1.01 – 2.72	.047
Parent Gender (Ref: Male)	0.09 (0.33)	1.10	0.58 – 2.07	.774
Child Gender (Ref: Male)	-0.34 (0.33)	0.71	0.37 – 1.35	.298
Child's Age (Ref: Age 6-10)	0.69 (.254)	1.99	1.21 – 3.28	.007
Parent Gender x Child Gender	-0.04 (0.46)	0.97	0.39 – 2.39	.940
Residency (Ref: Rural)	-0.28 (0.25)	0.76	0.46 – 1.23	.259
Education (Ref: Associates degree or below)	0.24 (0.25)	1.28	0.78 – 2.08	.331
Adjusted Model Intercept (Constant)	.601 (0.36)	1.83		
Model Chi-Square (df)			2.50 (8)	.962
Adjusted Model Nagelkerke Pseudo R^2			.06	

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Table 21. *Logistic Regression Analysis for Parental Attitudes toward their Child's Outdoor Recreation (PACOR) and Children Going on Errands Alone*

Independent Variables	*B (SE)*	Adjusted Odds Ratio*	95% Confidence Interval	*p*
PACOR (Ref: Low)	-0.89 (0.27)	0.41	0.24 - 0.69	.001
Parent Gender (Ref: Male)	-0.27 (0.33)	0.76	0.40 – 1.46	.410
Child Gender (Ref: Male)	-0.17 (0.35)	0.85	0.43 – 1.67	.632
Child's Age (Ref: Age 6-10)	1.11 (0.24)	3.02	1.88 – 4.86	.000
Parent Gender x Child Gender	0.22 (0.49)	1.25	0.48 – 3.27	.656
Residency (Ref: Rural)	0.12 (0.26)	1.13	0.68 – 1.89	.641
Education (Ref: Associates degree or below)	0.32 (0.26)	1.37	0.83 – 2.26	.218
Adjusted Model Intercept (Constant)	-0.94 (0.38)	0.39		
Model Chi-Square (df)			34.16 (7)	.000
Adjusted Model Nagelkerke Pseudo R^2			0.12	

Note: For active outdoor play in a typical week the reference category is 0 to 2 days.
*Adjusted for all other variables in the model.

Discussion

This study examined how parents' attitudes toward nature and toward children's participation in nature-based activities are associated with their children's participation in outdoor unstructured active play. The study addressed four objectives. The following section reviews the study objectives, reviews results from the study, and discusses how the results relate to the existing literature. Implications for future research and practitioners are also presented.

Parental Attitudes toward Nature and Children's Outdoor Active Play

The first objective of this study was to describe parental attitudes toward nature and outdoor unstructured play. Previous studies have suggested that parental attitudes toward nature are strongly related to children's participation in outdoor activities (Chen & Monroe, 2012). Overall, parents held favorable attitudes toward nature. Based on the PAN score results, the per question mean was 5.25, indicating that the most parents responded "somewhat agree," to questions pertaining to their involvement in nature. These findings closely resemble results reported by Hammond et al. (2011). Hammond et al. reported a mean PAN score of 5.21. The results are also similar to McFarland's et al. (2014) study findings. They also reported that most parents "somewhat agree" or "strongly agree" with the PAN items. Overall, parents reported an overall positive view of nature and enjoy participation in outdoor and nature-based activities.

The second objective was to describe parental attitudes toward their child's participation in outdoor unstructured play. The results showed parents held favorable attitudes toward their child's outdoor play. The PACOR per question mean was 5.10, indicating that the majority of parents responded "somewhat agree," pertaining to their child's participating in outdoor activities. This finding suggested that parents want their child involved in outdoor play.

Moreover, over half of the parents agreed that playing outdoors helps their child gain confidence, build their independence, and is a good way for their child to make friends. These findings are consistent with Hammond's et al. (2011) and McFarland et al. (2014) findings. Hammond's et al. (2011) results indicated that a PACOR mean score per question was 5.23. Overall, the PAN and PACOR scores suggest that parents have a positive view about nature and their child's outdoor play. These findings are consistent with previous studies that also indicated that parents enjoy nature and natural settings and place importance on opportunities to expose their children to nature and outdoor activities (e.g. Vadala et al., 2007; Wells & Lekies, 2006).

Association among Parental Attitudes and Unstructured Outdoor Active Play

The third objective was to examine the association among parental attitudes towards nature and their attitudes toward their children's outdoor unstructured play and their children's participation in outdoor activities.

Parental Attitudes and Outdoor Active Play

There was an overall positive and significant association observed between the PAN score and children's outdoor active play during a typical week, as well as outdoor unstructured active play during a typical week. Positive associations were also observed between PACOR and children's outdoor active play during a typical week and with unstructured outdoor active play during a typical week. These findings converge with McFarland's et al. (2014) and Hammond's et al. (2011) results. Specifically, for both studies, the more positive parents were about nature and about their child spending time in the outdoors, the more time their children had outdoors in free play. These findings follow other previous studies that reported similar patterns. Howard and Madrigal's (1990) findings indicated that parents play an instrumental role in guiding

children's activity patterns. Other research findings indicated that children are more likely to be involved in leisure activities when their parents spent more time devoted to leisure activities (Thompson, 2005; Lam & McHale, 2015). Chen and Monroe (2012) found that parents are one of the most frequent "socializers" to the outdoors. Their findings indicated that children's attitudes and behaviors toward the outdoors are highly influenced by parents, who transmit values and attitudes to them. Additionally, parents play an influential role when creating access to nature through granting freedom for their children to play and explore (Vadala et al., 2007). Overall, these findings support Hammond's et al. (2011) basic hypothesis that "parents who have a more positive 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" (p. 221).

Parental Attitudes and Independent Mobility

There was little association between parental attitudes and independent mobility. There was a positive association between PAN scores, as well as PACOR scores, and parents reporting their child plays alone in their backyard. There was a significant and negative association between PACOR scores and parents reporting they allow their child to go on errands alone**.** This result goes against the general expectation that parents with more positive attitudes about children's participation in outdoor activities would prioritize giving their children opportunities for independent mobility. Perhaps some of the influence of parental attitudes is overridden by the effect of child age which exhibited an odds ratio of 3.01. As discussed below, parental restrictions tend to be much tighter for younger children. Significant associations were not observed for going to a park or playground alone and going to school alone.

There was a positive and significant association with children's age and the four independent mobility variables. These findings are similar to previous research that reported that

older children have greater independent mobility (e.g., Prezza et al., 2007). However, most studies attribute lack of children's independent mobility to parent fears (e.g. Alparone & Pacilli, 2012; Prezza et al., 2001) and neighborhood safety and other factors (e.g. Veitch, Bagley, Ball, & Salmon, 2006; Carver et al., 2008). Because of the ages of the children in this study, parents may be hesitant to grant a lot of freedom to their children.

Overall, parents reported mostly "never" or "sometimes" when allowing their children to go to the school, park, playground alone, or going on errands during the day. On the other hand, parents reported mostly "always" for their child going alone to the backyard or private street. This may occur because more adult supervision can be provided in these areas. Previous research indicates higher levels of children's independent mobility in residential areas, such as homes, backyards or neighborhood settings (Page et al., 2010). Studies have also indicated that the age of children also influence independent mobility, such as older aged children are granted higher levels of independent mobility (Merom et al., 2006) and range of play away from home (Mitra, Faulkner, Builung, & Stone, 2013).

Influence of Parent and Child Gender and Child Age

The fourth objective was to determine whether associations between parental attitudes toward nature and their children's outdoor unstructured play participation vary by gender and age.

From the logistic regression results, there was no significant effect of parent or children's gender on the association between parent attitudes and their children's outdoor active play. Research by Page et al. (2010) suggested that gender can affect perceptions of the outdoor environment and to their children's physical activity. Shannon and Shaw's (2008) study focused

on understanding the role mothers play in developing their daughter's leisure attitudes and behaviors. Overall, the daughter's within the sample modeled their own mother's leisure knowledge, skills, and interests. Additionally, Bocarro's et al. (2015) results indicated that gender is one of the primary influences of children's physical activity in parks. However, significant effects of parent or children gender on the association between parent attitudes and their children's outdoor active play were not observed in this study. This may be because even though mothers and fathers differ in attitude toward nature and their child's outdoor active play, this difference may not interact with the child's gender (Kimiecik & Horn, 1998; Davidson et al., 2003; Shannon & Shaw, 2008).

There were no significant effects for age when the dependent variables were measured as activity in the past 7 days or typical week. However, age was a significant predictor of independent mobility. This is consistent with past literature. For example, Prezza's et al. (2001) results indicated that older children had more independence when playing in their neighborhood. Similar studies followed this trend, indicating that parents of older children allowed for greater independent mobility. A study conducted by Prezza (2007) confirmed that children between the ages of 8 and 11 never played outdoors without adults keeping a close eye on them. Previous research has also indicated that young children are more dependent on their parents to take them to parks and other play areas (Wolfe & McDonald, 2016; Alparone & Pacilli, 2012; Veitch et al., 2006).

Across the seven regression models, PAN and PACOR were significant predictors of children's active play in six of the models. PAN and PACOR were significantly associated with outdoor active play for a typical week, as well as for unstructured outdoor active play for a typical week. These findings are consistent with previous studies that also indicated that parental

attitudes toward the outdoors and their children's participation in the outdoors influence their children's outdoor activities (McFarland et al., 2014, Hammond et al., 2011; Vadala et al., 2007; Wells & Lekies, 2006; Carver, Timperio, & Crawford, 2008). Overall, findings indicated that parental attitudes toward nature and parental attitudes toward their child's outdoor active play have potential to improve our understanding of children's outdoor active play behavior.

Limitations

Several limitations in this study should be considered. First, study participants consisted primarily of White respondents. A more diverse sample could lead to findings that could be generalized more widely. At the same time, the purpose of this study did not encompass racial or ethnic comparisons. Second, time of the year may be another limitation. The survey occurred during late March and targeted a national sample. Participant's responses for the outdoor play questions may have been influenced by the climate and weather where they lived. Another limitation was the use of parent self-report measures in a survey questionnaire. Parents may have answered more favorably for questions involving their child's physical activity and independent mobility. Parents are likely to over report the amount of time children are spending in healthy activities regardless of the actual time spent in those activities (McFarland et al., 2014; Hammond et al., 2011). Fourth, the relationships observed in this study were evaluated using cross-sectional data. As a result, the data and analyses cannot be used to test for cause-and-effect relationships. Finally, although previous measures of parental attitudes toward nature (i.e., PAN and PACOR) were used, they represented general attitudes and not specific attitudes toward their child's outdoor play. Measures of general attitudes tend to be poor predictors of specific behaviors (Ajzen & Fishbein, 1980).

Although this study's findings are similar to Hammond's et al. (2011) and McFarland's et al. (2014), it improves on these earlier studies in two important ways. First, by using a larger and more representative sample of parents the study findings can be more widely generalized. The sample population for this study was much larger ($N = 407$) compared with McFarland's et al. (2014) sample population ($N = 69$) drawn from Southeast and Central Texas and Hammond's et al. 2011 sample population ($N = 142$) of the U.S. Second, findings from the current study are based on a random sample of parents rather than a convenience sample. As a national and more representative sample, the current study addressed a key limitation identified by Larson et al. (2011). Larson et al. observed that few studies of children's time outdoors have been conducted on a large geographic scale. In addition, the study had almost even representation from both parent and their children's gender: 50.4% of the parent responses were women and 49.6% of the parent responses were men. Furthermore, the parent's children in this study consisted of 54.3% male children and 45.7% female children. Another strength was the measures in the study, which were adapted from previous research (i.e., PAN, PACOR, and The Active Where? Survey). The measures in the study exhibited high reliability in the pre-test and in the study. Overall, results from these multiple tests demonstrate consistency and reliability in the measures across the two independent samples. Additionally, this research made a distinction between outdoor play and outdoor unstructured play. McFarland's et al. (2014) study did not address the difference between "outdoor play," "outdoor recreation," or other similar behaviors which they cited as a limitation. McFarland et al. (2014) recommend that further research should focus on either outdoor play or outdoor recreation. This study addressed outdoor play.

Implications for future research

Several directions for future research are suggested by this study. First, future research should explore how race and ethnicity can impact parental attitudes toward nature and parental attitudes toward their children's outdoor play. Different racial and ethnic groups may have their own set of attitudes and perspectives regarding the outdoor environment (Bustam et al., 2011). Investigating a more diverse audience may yield additional insight on the attitudes, values and beliefs of various race/ethnic groups toward the outdoor environment.

A second topic for future research is the influence of family structures. The current study only considered parents as a socialization influence. Family structures may also contribute to children's physical activity outdoors as well as children's independent mobility. Future research should examine how different structures in the household, such as single-parents, same-gender, and traditional households may impact children's outdoor physical activity. Research has indicated that mothers provide more assistive support, such as paying fees and enrolling their children in programs, whereas fathers overtly influence their child's activity, as well as directly engage in activity with their children (Beets et al., 2007).

Exploring how siblings impact children's time outdoors and range of play from home could inform current research. Edwards, Jago, Sebire, Kesten, Pool and Thompson (2015) indicated that siblings influence more of the home-based physical activity, be it in the garden or playing in the neighborhood. Findings from Hohepa, Scragg, Schofield, Kolt, and Shaaf (2007) indicated that siblings can support recreation behaviors that promote positive health behaviors, such as physical activity. Further research is needed to understand the influence of siblings and outdoor play activity.

Third, a qualitative approach may be of value to ask parents specifically their concerns and barriers of their child's outdoor activity. Children should also participate in the study to gather further insight on outdoor play and distance of play from home. Several studies of attitudes toward the outdoors used a qualitative approach, in which in-depth interviews and focus groups were used (e.g. Shaw & Dawson, 2001; Thompson et al., 2005). Lastly, activity monitors such as accelerometers or GPS tracking devices are alternative methods for measuring outdoor activity and range of play. Such methods are widely used to objectively measure children's physical activity and analyze spaces in which children spend their time (Bates & Stone, 2015; Robinson & Oreskovic, 2013; Tappe, Glanz, Sallis, Zhou, & Saelens, 2013).

Implications for Practice

One of the primary findings is that parents reported their child receiving an average of four days per week in outdoor play. According to the 2015 Centers for Disease Control and Preventions, children should accumulate at least 60 minutes of physical activity per day. Practitioners, specifically park and recreation specialists, can create parent-child outdoor programs to help increase the level of outdoor play. Additionally, practitioners can implement programs that also reach out to the various parent-child dyads; such as father-daughter or mother-son sport outdoor activities. Even if the children are a younger age, park and recreation programs such as outdoor family scavenger hunts, hikes in a community park, nature education programs, local swim lessons at a lake, or community gardens, can introduce a healthy and physically active lifestyle to children.

Another finding was that younger children (i.e., 6-10) were restricted in their independent mobility and range of play away from home. There are a couple ways that practitioners can address this problem and to encourage parents to increase their child's play away from home.

One way is to make local playgrounds and parks more accessible to the community. It is common that parents may not realize how close a park or playground is to their home. Communication to the community regarding their parks, trail systems, and playgrounds can positively increase parent's knowledge about the community's outdoor offerings. Furthermore, information about the accessibility of the facilities and services in each park should be clearly communicated to the public. Promotions should also emphasize that parks and recreation opportunities are safe for young children.

In general, park and recreation agencies should offer parent outdoor training programs or educational sessions on leading healthy lifestyles. Outdoor training programs may consist of teaching parents how to play with their child in the outdoors. Parents can benefit from these programs by learning about various outdoor activities and how to motivate their child to become more active outdoors. Parent education sessions can discuss health concerns that are connected to living a sedentary indoor lifestyle. Parents can learn about how their child may be at risk which can encourage parents to spend more time outdoors with their child. Improving parent's education regarding the outdoors can only positively benefit their children. Additionally, parent education forums can provide a time where parents may express any wants, needs or questions about the park and recreation program offerings.

Conclusion

Overall, parents held favorable attitudes toward nature and toward their child's outdoor unstructured play. Some of the key findings are as follows. The more positive a parent was about nature and about their child spending time in the outdoors, the more time the child had outdoors in outdoor active play. A significant effect of parent or children gender on the association between parent attitudes and their children's outdoor active play was not observed within this

study. Age was an important predictor of independent mobility such that older children (i.e., 11-14 years old) were allowed greater levels of independent mobility. The study suggested that that parental attitudes can influence their child's outdoor participation and activity levels. Research exploring parental environment attitudes is essential to provide information to improve communication with parents about the benefits of outdoor play. This study can be used to help develop and enhance outdoor program opportunities for children. Ultimately, in view of the numerous social, physical, and developmental benefits that children get from outdoor play, the study sought to provide new information that can make these benefits more widely available to children and their families.

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APPENDICES

i. Parental Attitudes Toward Nature Qualtrics Survey

Hello,

Thank you for agreeing to participate in this study of children's outdoor play. The purpose of this study is to learn how to work with parents to increase children's involvement in healthy and active outdoor play. Also, parks and recreation agencies can use these results to plan programs for children and families. We value your opinions and your privacy. Although your responses are very important to us, your participation in this study is voluntary. This survey should take approximately 15 minutes to complete. Information gathered during this survey is anonymous and confidential and will not be linked to you in any way.

To begin, click the START button to go to the first question of the survey.

Thank you for your participation!

Q1 Are you a parent?

- ❍ Yes
- ❍ No

Q2 Are you:

- ❍ Male
- ❍ Female

Q3 In what age range is your child?

- ❍ Under 1-year-old
- ❍ 1-2 years old
- ❍ 3-5 years old
- ❍ 6-8 years old
- ❍ 9-11 years old
- ❍ 12-14 years old
- ❍ 15-17 years old
- ❍ 18 years old or above

Q4 Is there a neighborhood park or playground within walking distance from your home?

- ❍ Yes
- ❍ No

Q5 Over a typical or usual week on how many days does your child visit the neighborhood park or playground?

- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7

The first set of questions ask about your opinions of nature and outdoor activities. Tell us to what extent do you agree or disagree with each of the following statements:

Q1 I really enjoy nature.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q2 I enjoy watching the sky on summer nights.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q3 I enjoy pictures of birds and animals.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q4 I like sitting beside a quiet pond.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q5 Walking in the woods is a waste of time.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q6 I wish I knew more about nature.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q7 People should spend more time outside.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q8 I like TV programs about nature.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q9 I would like to vacation in a cabin in the woods.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q10 I feel good when I am close to nature.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q11 I like the sound that a stream makes.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q12 I like walking through the leaves in the fall.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q13 Spending time outdoors is an enjoyable alternative to watching TV.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q14 Family vacations are a good opportunity to spend time outdoors.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q15 I enjoy eating meals outdoors.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

The next set of questions ask about your child's outdoor activities. Answer these questions for your child with the most recent birthday, who is between the ages of 6 and 14 years, and who lives in your house most of the time. Tell us to what extent do you agree or disagree with each of the following statements:

Q1 Playing outside encourages too much aggressive behavior.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q2 All playgrounds should contain natural elements.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q3 Playing outside would be good for my child's health.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q4 There is too much crime for my child to play outside.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q5 I think my child should go on nature hikes.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q6 Playing outside is a wasteful way for my children to spend their free time.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q7 My neighborhood is safe enough for children to play outside.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q8 I would let my child walk in the rain even if they got wet.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree

❍ Slightly agree
❍ Somewhat agree
❍ Strongly agree

Q9 My child gets too dirty when playing outside.

❍ Strongly disagree
❍ Somewhat disagree
❍ Slightly disagree
❍ Slightly agree
❍ Somewhat agree
❍ Strongly agree

Q10 I am afraid my child may be harmed by strangers outside.

❍ Strongly disagree
❍ Somewhat disagree
❍ Slightly disagree
❍ Slightly agree
❍ Somewhat agree
❍ Strongly agree

Q11 Spending time outdoors is a meaningful family activity.

❍ Strongly disagree
❍ Somewhat disagree
❍ Slightly disagree
❍ Slightly agree
❍ Somewhat agree
❍ Strongly agree

Q12 I worry that my child will be hurt by gangs if he/she played outside.

❍ Strongly disagree
❍ Somewhat disagree
❍ Slightly disagree
❍ Slightly agree
❍ Somewhat agree
❍ Strongly agree

Q13 My child's learning can be stimulated by outdoor play.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q14 Playing outside hurts my child's school grades.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q15 Playing outdoors is a good way to improve hand-eye coordination.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q16 Other children in my neighborhood are safe for my child to play around.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q17 Children who play outdoors gain confidence.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly Disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q18 I allow my child to have a wide range of recreation outdoor activities from which to choose.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q19 I feel that outdoor play interferes too much with my child's homework time.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q20 My child is easier to manage after spending time outside.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q21 I am afraid my child may be abducted outdoors.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q22 I let my child make mud pies.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q23 Taking part in outdoor recreation improves my child's communication skills.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q24 Outdoor activities over stimulate my child.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Somewhat agree
- ❍ Strongly agree

Q25 Taking part in outdoor activities helps to build up my child's level of independence.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q26 I would let my child play in a sand box.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q27 Outdoor activities are a good way for my child to make friends.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

Q28 Participating in outdoor play is a good way for my child to get exercise.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Slightly disagree
- ❍ Slightly agree
- ❍ Somewhat agree
- ❍ Strongly agree

The next questions ask about how much time your child spends outdoors in physical activity. Outdoor physical activity is any activity that increases your child's heart rate and makes your child get out of breath some of the time. Outdoor physical activity can be done in sports, playing with friends, or walking to school. Some examples of physical activity outdoors are running, climbing, brisk walking, rollerblading, biking, skateboarding, swimming, soccer, basketball, and football.

Add up the time your child spends in physical activity in the outdoors each day (do not include school physical education or gym class). Once again, answer these questions for your child with the most recent birthday, who is between the ages of 6 and 14 years, and who lives in your house most of the time. Check the answer that best applies to your child:

Q1 For the past seven days, how many days was your child physically active outdoors for a total of at least 60 minutes per day?

- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7

Q2 Over a typical or usual week, on how many days is your child physically active outdoors for a total of at least 60 minutes per day?

❍ 1
❍ 2
❍ 3
❍ 4
❍ 5
❍ 6
❍ 7

The next two questions ask about how much time your child spends outdoors in unstructured play. Outdoor unstructured play is an unplanned or unorganized outdoor activity that your child participates in, also known as "free play." Check the answer that best applies to your child.

Q3 For the past seven days, how many days was your child physically active outdoors in unstructured play for a total of at least 60 minutes per day?

❍ 1
❍ 2
❍ 3
❍ 4
❍ 5
❍ 6
❍ 7

Q4 Over a typical or usual week, on how many days is your child physically active outdoors in unstructured play for a total of at least 60 minutes per day?

❍ 1
❍ 2
❍ 3
❍ 4
❍ 5
❍ 6
❍ 7

We are interested in how much freedom you give your child to play away from home without supervision. Once again, please answer the following questions for your child with the most

recent birthday, who is between the ages of 6 and 14 years, and who lives in your house most of the time.

Q1 How often does your child go alone or with peers to and from school?

❍ Never
❍ Sometimes
❍ Often

Q2 How often does your child go alone to play in a playground or park near your home?

❍ Never
❍ Sometimes
❍ Often

Q3 How often does your child go alone to play in a backyard or private street near your home?

❍ Never
❍ Sometimes
❍ Often

Q4 How frequently does your child go out alone on small errands to make purchases during the day?

❍ Never
❍ Sometimes
❍ Often

Q5 Are there places, other than homes, where your child meets friends to play?

❍ Yes
❍ No

Q6 If yes to previous question, who does your child go there with during non-school periods?

❍ Always accompanied by mother, father or other adults (or there are no places).
❍ Sometimes accompanied by mother, father or other adults, sometimes alone or with peers.
❍ Always alone or with peers.

Q7 In general in these places (other than homes, where your child meets friends to play), are you:

- ❍ Always present (or there are no places).
- ❍ Sometimes present but other adults present.
- ❍ Never present, but other adults present.
- ❍ Sometimes present and other adults absent.
- ❍ Never present and other adults absent.

Now we want to know a little about your neighborhood. Which of the following statements best describe your neighborhood?

Q1 There are sidewalks on most of the streets in my neighborhood.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Somewhat agree
- ❍ Strongly agree

Q2 Sidewalks are well maintained in my neighborhood.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Somewhat agree
- ❍ Strongly agree

Q3 There are bicycle/pedestrian trails in my neighborhood.

- ❍ Strongly disagree
- ❍ Somewhat disagree
- ❍ Somewhat agree
- ❍ Strongly agree

Q4 Which of the following best describes the community in which you live?

- ❍ Urban (generally inside a city or urbanized area with a population greater than 100,000)
- ❍ Small Urban/Suburban (generally a city or urban area outside a principal city with a population less than 100,000)
- ❍ Rural Fringe (Generally inside a town or rural area that is within 10 miles from an urban area)
- ❍ Rural Distant (Inside a town or rural area more than 10 miles from the nearest urban area)

We would like to know more about you and your child. Please answer these questions for your child with the most recent birthday, who is between the ages of 6 and 14 years old, and who lives in your house most of the time.

Q1 How old was your child on their last birthday?

- ❍ 6 years old
- ❍ 7 years old
- ❍ 8 years old
- ❍ 9 years old
- ❍ 10 years old
- ❍ 11 years old
- ❍ 12 years old
- ❍ 13 years old
- ❍ 14 years old

Q2 Is your child:

- ❍ Male
- ❍ Female

Now, please answer all the questions for you, not your child. Remember, all questions are confidential.

Q2 Your Age:

Q3 In which state do you currently reside?

- ❍ Alabama
- ❍ Alaska
- ❍ Arizona
- ❍ Arkansas
- ❍ California
- ❍ Colorado
- ❍ Connecticut
- ❍ Delaware
- ❍ District of Columbia
- ❍ Florida
- ❍ Georgia
- ❍ Hawaii
- ❍ Idaho
- ❍ Illinois
- ❍ Indiana
- ❍ Iowa
- ❍ Kansas
- ❍ Kentucky
- ❍ Louisiana
- ❍ Maine
- ❍ Maryland
- ❍ Massachusetts
- ❍ Michigan
- ❍ Minnesota
- ❍ Mississippi
- ❍ Missouri
- ❍ Montana
- ❍ Nebraska
- ❍ Nevada
- ❍ New Hampshire
- ❍ New Jersey
- ❍ New Mexico
- ❍ New York
- ❍ North Carolina
- ❍ North Dakota
- ❍ Ohio
- ❍ Oklahoma
- ❍ Oregon
- ❍ Pennsylvania
- ❍ Puerto Rico

- ❍ Rhode Island
- ❍ South Carolina
- ❍ South Dakota
- ❍ Tennessee
- ❍ Texas
- ❍ Utah
- ❍ Vermont
- ❍ Virginia
- ❍ Washington
- ❍ West Virginia
- ❍ Wisconsin
- ❍ Wyoming
- ❍ I do not reside in the United States

Q4 What race/ethnic group would you place yourself? (Check all that apply):

- ❍ Black or African American
- ❍ White
- ❍ Asian
- ❍ Native Hawaiian or Other Pacific Islander
- ❍ Hispanic or Latino
- ❍ American Indian or Alaskan Native
- ❍ Unknown
- ❍ I choose not to respond

Q5 Highest degree or level of school completed (Please check one):

- ❍ No schooling completed
- ❍ Nursery school to 8th grade
- ❍ High School graduate, diploma or the equivalent
- ❍ Some college credit, no degree
- ❍ Trade/technical/vocational training
- ❍ Associate degree
- ❍ Bachelor's degree
- ❍ Master's degree
- ❍ Professional degree
- ❍ Doctorate degree

Q6 Which of the following best describes your current work status?

- ❍ Employed for wages
- ❍ Self-employed
- ❍ Out of work and looking for work
- ❍ Out of work but not currently looking for work
- ❍ A homemaker
- ❍ A student
- ❍ Military
- ❍ Retired
- ❍ Unable to work

Q7 Marital Status:

- ❍ Single, never married
- ❍ Married or domestic partnership
- ❍ Widowed
- ❍ Divorced
- ❍ Separated

Q8 How many children in your household are under the age of 14?

Q9 How many days during the week does your child live at this address?

- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7

Thank you for completing the questionnaire.