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The Relationship between Parental Attitudes toward Nature and the Amount of Time Children Spend in Outdoor Recreation

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Abstract

The purpose of this research was to investigate the relationship between parental attitudes toward nature and the amount of time children spend in in outdoor free play activities. Parents with children between 3 and 5 years old participated. Sixty-nine responses were gathered. The assessment tool was composed of four sections that asked parents about their attitudes toward nature and outdoor settings, their attitudes about their young children spending time outdoors, how much time their children spent in outdoor activities including free play, and demographic questions. Parents reported a positive view of nature and their children's outdoor recreation. Parents' attitudes toward nature and toward their children's outdoor recreation were related to the amount of time their children spent in free play outdoors.

Keywords: *play, horticulture, sociohorticulture*

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A great deal of attention recently has been focused on the fact that children spend less time outdoors resulting in what has been termed "nature-deficit disorder" (Louv, 2008). According to Louv, this term "describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses" (p. 36). Louv has found examples of this phenomenon throughout society.

While many adults associate their childhood with playing outdoors, this experience is not being shared by their children (Clements, 2004). Children today spend an increasing amount of time indoors compared to outdoors (Karsten, 2005; Tranter & Doyle, 1996). A study utilizing time diaries reported that most children aged 3–11 years old spent fewer than 30 minutes a week in outdoor activities (Hofferth & Sandberg, 2001). Alternatively, an average of 12 hours per week was spent watching television (Hofferth & Sandberg, 2001). Additionally, many American preschool children reportedly spend significant amounts of time in sedentary activity (Oliver, Schofield, & Kolt, 2007).

Along with this increase in sedentary lifestyles, it has been reported that health issues such as obesity and Type II diabetes were on the rise among preschool-aged children (Burdette, Whitaker, & Daniels, 2004; Fagot-Campagna et al., 2000; Troiano, Flegal, Kuczmarski, Campbell, & Johnson, 1995). In fact, children as young as 2 years old were found to be increasing in weight-to-height ratio (Ogden et al., 1997). This weight increase among children has been attributed to decreased physical activity and to increased caloric intake (Andersen, Crespo, Bartlett, Cheskin, & Pratt 1998; Ebbeling, Pawlak, & Ludwig, 2002; Epstein, Paluch, Consalvi, Riordan, & Scholl, 2002; Ness et al., 2007; Schlicker, Borra, & Regan, 1994; Trost, Kerr, Ward, & Pate, 2001).

It has been suggested that one of the best ways to prevent and treat obesity is to eat less and be more active (Ebbeling et al., 2002). Time spent outdoors has consistently been found to be a predictor of children's physical activity levels (Sallis, Prochaska, & Taylor, 2000). Recommendations from the American Heart Association stated that children need at least 60 minutes of vigorous activity per day (Kavey et al., 2003). Research has found that children as young as four years of age already do not meet these recommendations. Furthermore, children tend to only be active during physical education classes rather than throughout the day (Janz et al., 2002; Ness et al., 2007; Pate et al., 2002). The lack of physical activity at a young age causes children to develop poor habits of initiating self-guided physical activity, leading to reduced physical activity levels later in life. Therefore, programs aimed at increasing the amount of time children spend in outdoor activities may simultaneously improve the amount of physical activity in which children participate and in which they involve themselves as they age.

Among preschool-aged children, the most opportunity for physical activity has been reported to occur in the form of free play (Burdette et al., 2004). Free play is informal, unstructured, typically outdoor child-driven activities (Burdette & Whitaker, 2005; Burke, 2005), and is frequently characterized by "short intermittent bouts of activity with frequent rest periods" (Burdette et al., 2004, p. 353). In fact, free outdoor play is the preferred form of physical activity when compared to sports or exercise, even in preschool-to-1st-grade-aged children (Graf et al., 2004; Burdette & Whitaker, 2005; Burke, 2005). If given the opportunity for free outdoor play, children may be more willing to actively participate resulting in more frequent moments of moderate to vigorous physical activity. This suggestion is supported by research by Bailey, Olson, Pepper, Barstow, and Cooper (1994), who reported that more physical activity occurred in American children ages 6–10 years old when they were given the opportunity for free play compared to when they were given structured activities.

Free play also has benefits for young children beyond physical fitness. Cognitive development, mental health, and social and emotional well-being also have been found to improve with increased outdoor play (Ginsburg, 2007; Ramstetter, Murray, & Garner, 2010). For example, outdoor play and contact with nature significantly reduced symptoms of attention deficit disorder in diagnosed children (Taylor, Kuo, & Sullivan, 2001; Kuo & Taylor, 2004). This finding was further supported by research finding students who had recess breaks had better classroom behavior when compared to students without recess breaks at school (Barros, Silver, & Stein, 2009). Similarly, Gray (2011) and Ginsburg (2007) argued that the decline in free play time has resulted in the rise of psychopathology in children, particularly increased anxiety, depression, and narcissism and explained that free play helps children learn how to solve problems, self-regulate, and to value intrinsic interests.

Regardless of children's preferences, parental attitudes have a strong influence on children's activities and attitude development (Brown, 1990; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Hutchinson & Baldwin, 2005). Social learning theory suggests that children learn how to act and behave by observing others (Bandura, 1973; Bandura, 1974). Bandura's (1973, 1974) research found that children learned how to behave by observing those around them. People such as parents, friends, and teachers set examples through their attitudes and behaviors, and the consequences of those attitudes and behaviors. Children imitate these role models and adopt the behaviors, values, beliefs, and attitudes those individuals exhibit. Primary socialization theory suggests that, "In Western society the primary socialization sources through the critical adolescent period are usually the family, the school, and peer clusters" (Oetting & Donnermeyer, 1998, p. 998). If parents espouse a positive attitude toward a concept, a child may develop a similarly positive attitude and then behave in a way that would elicit positive reinforcement from their parents. For example, children's attitudes about exercise, physical activity, and food were similar to those of their parents (Dowell, 1973; Godin & Shepard, 1984; Scaglioni, Salvioni, & Galimberti, 2008; Trost et al., 2003). Furthermore, parental attitudes influence the environment in which children form their own personal attitudes and in which they behave (Scaglioni et al., 2008). This would suggest that parent attitudes about the outdoors and nature would impact the amount of time children spend in those areas, which would then influence the amount of physical activity in which children participate outdoors. Hammond, McFarland, Zajicek, and Waliczek (2011) found an inverse relationship in parents' attitudes toward nature and the time their middle-school-aged children spent indoors. Positively changing parents' knowledge, attitudes, and beliefs regarding physical activity and eating could be a significant factor in preventing childhood obesity (Dietz & Gortmaker, 2001).

Demographic factors such as age and gender of child, race and ethnicity, education level of parents, family structure (married, unmarried, etc.), and family income are also related to how time is spent (Hofferth & Sandberg, 2001). Generally, younger and female children tend to spend less time outdoors (Robinson & Bianchi, 1997). Higher income families tend to place more importance on academic skills and books and less emphasis on outdoor play. Children in single-parent households and in families of certain cultural backgrounds generally have more household responsibilities and less time allotted for outdoor play (Longfellow, 1979; Taylor, 1994). On the other hand, parents with higher socioeconomic status preferred that their children participated in structured activities such as sports rather than free play (McHale, Crouter, & Tucker, 2001).

The most critical period for children to participate in play and early sensory experiences is from birth to 5 years old due to the high levels of childhood development at this age-level (Chugani, 1998; Greenough & Black, 1992; Shatz, 1992). Even toddlers have been reported to

not meet the recommended guidelines for physical activity levels and children as early as 2 years of age have been found to be increasing in obesity levels. The purpose of this research project was to investigate the relationship between parental attitudes toward nature, parental attitudes toward their children's outdoor recreation, and the amount of time toddlers, specifically children ages 3–5 years old, spend in outdoor free play activities. Two hypotheses guide this study:

Hypothesis 1: Parental attitudes toward nature are positively related to the amount of time children spend in outdoor activities.

Hypothesis 2: Parental attitudes toward their children's outdoor recreation are positively related to the amount of time children spend in outdoor activities.

Method

Sample

The sample for this study was a convenience sample drawn from two university child development centers in Texas. All families with children between the ages of 3 and 5 years old were requested to participate and given the questionnaire packet. A total of 145 packets were distributed to families between the two sites by the child development center staff. A second contact, a postcard thank you/reminder, was distributed by the centers one week after the initial distribution of the questionnaire. The third and final contact included a replacement questionnaire and was made approximately three weeks after the first questionnaire was given to families at the center. Responses were gathered from a total of 69 people from the 145 distributed, for a response rate of 47.5%. Non-response was controlled for by separating early and late responders and conducting statistical analysis to identify any differences between the two groups on either attitudinal scale or the amount of time their children spent in various activities (Lindner, Murphy, & Briers, 2001). *An incentive of a wildflower seed packet was given to parents when the questionnaires were distributed. Parents were ensured that responses were anonymous and that their consent form was not attached to their responses to elicit honest responses rather than socially desirable ones.*

Instrumentation

The assessment tool used in this study was composed of four sections that asked parents about their attitudes toward nature and outdoor settings, their attitudes about their young children spending time outdoors, how much time their children actually spent in outdoor free play activities, and standard demographic questions. The overall assessment tool was developed and administered using Dillman's (2007) tailored design method which is "a set of procedures for conducting successful self-administered surveys that produce both high-quality information and high response rates" (p. 29). Dillman's method to design a survey consists of four stages of pretest procedures: Stage 1: review by knowledgeable colleagues and analysts, Stage 2: interviews to evaluate understanding of instructions and questions, Stage 3: pilot testing, and Stage 4: a final check. During the final check, people unfamiliar with the study or survey instrument were asked to review and complete the questionnaire as readers who had worked on a prior revision lose their ability to detect obvious errors. In this stage, the instrument reviewers were asked about the ease in completing the questionnaire. Feedback was used to clarify instructions and navigational guides used to direct participants through the instrument. According to Dillman (2007), this process is necessary to improve response rate and validity of responses. Each of these stages was utilized to ensure content and face validity.

Parental attitudes section. The parental attitude toward nature (PAN) and parental attitude toward their child's outdoor recreation (PACOR) scales were used and adapted for this study with permission (McFarland, Hammond, Zajicek, & Waliczek, 2011). Adaptations were made according to Dillman's method (2007). Responses that decreased reliability according to pilot test data were removed from the original scale (McFarland, Hammond, Zajicek, & Waliczek, 2011). The PAN scale had a reported internal consistency of $\alpha = 0.85$ when used with parents of 6- to 13-year-olds (Hammond et al., 2011), which is considered high (Gall, Borg, & Gall, 2006). The PACOR scale had a reported internal consistency of $\alpha = 0.87$ when used with parents of 6- to 13-year-olds (Hammond et al., 2011). Since the reported internal consistencies were with parents of an older age group, the panel of expert reviewers was asked to consider the appropriateness of questions for parents of 3- to 5-year-olds. Additional changes to the wording of specific questions were made based on the reviewers' suggestions. Once the scale was approved by the panel of reviewers, it was distributed to the sample for this study.

The PAN section of the survey asked parents to rate 15 statements about their attitudes toward nature, and the PACOR section of the survey asked parents to respond to 21 statements about their attitudes toward their children's outdoor recreation. Each scale was multidimensional. The PAN scale included questions related to passive outdoor recreational activities such as simply being in nature and enjoying nature-based programming in other areas of life. Examples of questions include "I like sitting beside a quiet pond," People should spend more time outside," and "I like TV programs about nature." The PACOR section included questions related to parents' fears about safety when their child is outdoors, the benefits and consequences for children spending time outdoors, and behavioral issues related to spending time outdoors. Examples of questions on the PACOR scale include "Playing outside is a wasteful way for children to spend their free time," "Playing outdoors is a good way to improve hand-eye coordination," and "I allow my child to have a wide range of recreational outdoor activities from which to choose." Both sections allowed responses on a 6-point Likert-type scale with responses ranging from "strongly agree" to "strongly disagree." Both sections of the questionnaire were scored based on the responses given. Negatively stated questions were reverse coded for data analysis. The score was derived for each section by taking the cumulative sum of the responses for each section.

Children's time spent in various outdoor free play activities. The second section of the questionnaire asked parents to indicate the amount of time their child spent on average each day in various types of outdoor free play activities. Specifically, parents were asked to respond to the following questions: "How much time per day does your child spend outdoors in free play at home on average?." Possible responses included, "None," "Less than 30 minutes," "30 minutes to 1 hour," "1 to 2 hours," and "2 or more hours."

Demographic section. Finally, since demographic influences are known to have an impact on how children spend their time, standard demographic questions were asked including parent and child gender, child's age, ethnicity, and parent marital status. This section also asked parents to describe the area they live as rural, suburban, urban, or inner city. This data was collected to control for the influence of demographic variables on the responses to the PAN and PACOR scale, since it is expected based on past research (Hofferth & Sandberg, 2001; Longfellow, 1979; Robinson & Bianchi, 1997; Taylor, 1994).

Data Analysis

The data were manually entered into SPSS (version 17.0; SPSS, Chicago). Statistical analyses included descriptive statistics (range and mean) and Pearson's product moment correlations between parents' scores on each scale and the amount of time they reported their children spent

in outdoor free play (with a Bonferroni correction). The data for time spent in outdoor free play was treated as interval data (Levin & Fox, 2006). The critical alpha for significance was set a priori to $P < 0.05$. A Cronbach's internal consistency analysis of the final instrument after data collection showed the PAN and PACOR scales both had a high internal consistency of $\alpha=0.85$ and $\alpha=0.89$ when used with parents of children aged 3–5 years old.

Two multiple regression analyses were completed to control for the influence of the demographic variables on the PAN scale mean score and the PACOR scale mean score. All demographic variables (parent gender, child gender, child's age, ethnicity, marital status, residential area, education level, and yearly household income) were included in the regression equation. Early or late responder categories were also included to control for non-response. Finally, a variable was coded to indicate which of the two test sites the child attended to investigate any influence from the site attended. These calculations were conducted solely to ensure that the skewed sample did not impact the results of the study.

Results

Demographics

Of those parents who responded, 13 (18.8%) were male, and 56 (81.2%) were female. The children included in the study consisted of 41 male children (59.4%) and 28 female children (40.6%). Children were 3 to 5 years old, with a mean age of 3.78 years old. With regard to ethnicity, 43 (62.3%) respondents indicated that they were "White," 2 (2.9%) were "African American," 8 (11.6%) indicated "Hispanic," 13 (18.8%) indicated "Asian or Pacific Islander," and 3 (4.3%) indicated "None of the above." The vast majority of respondents were "married/partnered" with 66 (95.7%) respondents selecting this category for marital status. Other responses to this question indicated that 1 (1.4%) participant selected each of the following categories: "single, never married," "divorced," and "widowed."

Respondents were also asked to indicate the area in which they live and their education level. In response to where participants lived, 9 (13.0%) participants indicated a "rural" environment, 38 (55.1%) indicated a "suburban" area, 18 (26.1%) indicated "urban," and 4 (5.8%) indicated that they considered the area they lived in to be "inner city." Respondents indicated their education level. "Some college" was selected by 6 (8.7%) participants, "4-year college degree" was selected by 9 (13.0%) participants, "graduate school" was selected by 53 (76.8%) participants, and "other" was selected by 1 (1.4%) participant.

A section of the demographics also requested information regarding the yearly household income of the families in the study. Responses indicated that 1 (1.4%) participant indicated "less than $14,999," 7 (10.1%) indicated "$15,000–$29.999," 4 (5.8%) indicated "$30,000–$49,000," 14 (20.3%) indicated "$50,000–$74,999" 9 (13.0%) indicated "$75,000–$99,999" and 33 (47.8%) indicated "$100,000 and above." One (1.4%) respondent declined to respond to this question (Table 1).

Since the sample of this study was not representative of the general population, it may be suggested that the results of this study were based on the skewed demographics of the sample. To verify whether or not the results of this study were based on demographics alone, two multiple regression analyses were used. The regression equations attempted to investigate the predictive value of parent's gender, child's gender, child's age, ethnicity, marital status, residential area, education level, yearly household income, responder type, and site attended. The nominal variables with more than two categories: ethnicity, marital status, and residential area were coded as a series of dichotomous variables to allow for dummy coding. The regression equation identify-

Table 1

Demographic Analysis of the Overall Sample by Gender of Parent, Gender of Child, Ethnicity, Marital Status, Residential Area, Education Level and Income Level in the Study of the Relationship between Parental Attitude toward Nature and the Development of Fine and Gross Motor Skills in Children.

Demographic variable	n	Parental Attitude toward Nature Mean Score	Parental Attitude Toward Their Child's Outdoor Recreation Mean Score
Gender of Parent			
Male	13	80.00	141.16
Female	56	80.38	143.77
Gender of Child			
Male	41	79.29	144.02
Female	28	81.79	142.18
Age of Child			
3	33	80.21	143.76
4	29	79.52	142.28
5	7	84.00	145.14
Ethnicity			
White	43	80.42	145.07
Asian/Pacific Islander	13	79.38	135.77
Hispanic	8	79.00	140.75
African American	2	86.50	162.00
None of the Above	3	82.00	144.33
Marital Status			
Single, never married	1	68.00	126.00
Married/Partnered	66	80.76	144.97
Divorced	1	77.00	106.00
Widowed	1	66.00	86.00
Residential Area			
Rural	9	78.67	150.78
Suburban	38	81.05	144.03
Urban	18	78.78	138.44
Inner City	4	83.75	141.00
Education Level			
Some college	6	79.00	148.83
4-year college degree	9	84.11	149.11
Graduate School	53	80.21	142.75
Other	1	59.00	85.00
Yearly Household Income			
Less than $14,999	1	68.00	126.00
$15,000-$29,000	7	80.00	132.00
$30,000-$49,000	4	84.50	152.50
$50,000-$74,999	14	81.50	143.07
$75,000-$99,000	9	78.44	136.78
$100,000 and above	33	80.88	148.70

[z]Possible scores ranged from 15 to 90. Actual scores ranged from 59 to 90.
[y]Possible scores ranged from 28 to 168. Actual scores ranged from 86 to166.

ing PAN as the dependent variable was not statistically significant ($P = 0.33$). In addition, no individual independent variable was statistically significant (all Ps > 0.05). Since the regression equation and individual independent variables were not significant, the PAN scale score could not be predicted by knowing demographic information alone. This indicated that no independent variable had any relationship with the dependent variable of the PAN scale score. The regression analysis also indicated that early and late responders responded similarly to the PAN

scale controlling for non-response. Since the regression equation was not statistically significant, meaning that demographic variables alone cannot account for changes in the PAN scale score, that indicates that something other than demographic variables influenced PAN scale scores.

The second regression identified PACOR as the dependent variable and was statistically significant ($P = 0.001$). Specifically, within the model, parents being married or partnered was statistically significant ($\beta = 0.559$, $P = 0.003$). All other independent variables were not statistically significant. This indicated that marital status was related to the dependent variable of PACOR scale score. However, the vast majority of the participants in this study were married (95.7%) making any statistical conclusions regarding marital status null due to the sample sizes of the other marital status groups being merely one participant. The regression analysis also indicated that early and late responders responded similarly to the PACOR scale controlling for non-response.

Parental Attitudes toward Nature

The PAN scale scores among respondents ranged from 59 to 90. The mean score for this scale among respondents was 80.30 ($SD = 7.37$). This indicated that most parents answered statements as either "*somewhat agree*" or "*strongly agree,*" suggesting that parents reported an overall positive view of nature.

Parental Attitudes toward Their Child's Outdoor Recreation

The PACOR scale scores among respondents ranged from 85 to 166. The mean score among respondents for this scale was 143.28 ($SD = 16.71$). This indicated that most parents answered statements as either "*somewhat agree*" or "*strongly agree,*" suggesting that parents reported an overall positive view of their child's outdoor recreation.

Amount of Time Children Spent in Outdoor Free Play

Frequency statistics indicated that the vast majority of respondents indicated that their children spent between 30 minutes to 1 hour in outdoor free play each day (Figure 1). An additional 28 parents indicated that their children spent more than 1 hour outdoor in free play each day.

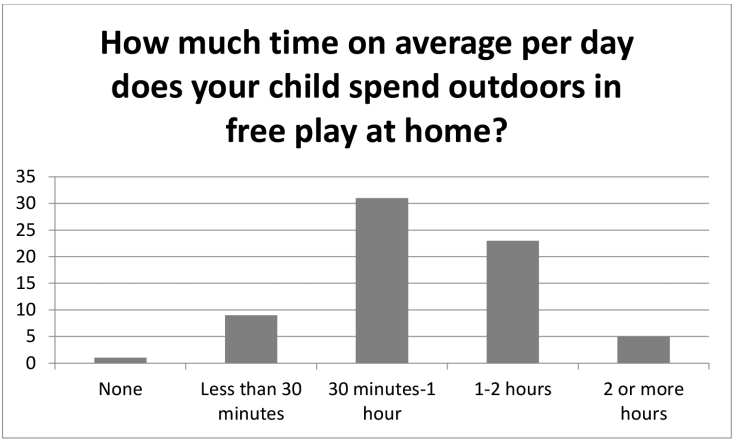

Figure 1. Respondent (N=69) indication of the average amount of time their children spent in outdoor free play each day in the study of the relationship between parental attitudes toward nature and the amount of time children spend in outdoor play.

The remaining 10 parents indicated that their children spent less than 30 minutes outdoors in free play each day. This suggests that children do not spend enough time in outdoor play considering current recommendations for physical activity (Burdette et al., 2004; Burdette & Whitaker, 2005; Burke 2005; Kavey et al., 2003).

Comparisons between Parental Scores and Children's Time Spent in Outdoor Free Play

A Pearson's product moment correlation analyzing the relationship between PAN scale score and the amount of time parents reported their children spending in outdoor free play was calculated. A moderate positive statistically significant relationship was identified ($R^2 = 0.365$; $P = 0.002$) (Levin & Fox, 2006) (Table 2). This remains significant with a Bonferonni correction applied to the a priori alpha level for multiple analyses. This indicated that as parents' scores on the PAN scale increased, so did the amount of time they reported their children spending in outdoor free play.

Table 2

Pearson's Product Moment Correlation Indicating the Relationship between PAN Scale Score and PACOR Scale Score with the Average Amount of Time Parents Reported their Children Spending in Outdoor Free Play Per Day in the Study of the Relationship between Parental Attitude toward Nature and the Development of Fine and Fross Motor Skills in Children.

Scale	Measurement[z]	How much time on average per day does your child spend outdoors in free play at home?
PAN[y]	Pearson's correlation	0.365
	P	0.002*
PACOR[x]	Pearson's correlation	0.464
	P	0.001*

[z]N=69

[y]Parental attitude toward nature scale score.

[x]Parental attitude toward their child's outdoor recreation scale score.

*Statistically significant at the 0.05 level with a Bonferroni correction applied.

A Pearson's product moment correlation was also calculated to analyze the relationship between the PACOR scale score and the amount of time parents reported their children spending in outdoor free play was calculated and was a moderate positive statistically significant correlation ($R^2 = 0.464$; $P = 0.001$) (Levin & Fox, 2006) (Table 2). This also remains significant after a Bonferonni correction is applied. This indicated that as parents' scores on the PACOR scale increased, do did the amount of time they reported their children spending in outdoor free play.

These finding offers support for the hypothesis one and two. Parental attitudes toward nature and toward their children's outdoor recreation positively related to the amount of time their children spent in outdoor activities.

Discussion

The results of this study combined with other research reinforce the concept popularized by Richard Louv's (2008) book, *The Last Child in the Woods*, which argued that children today

are spending little time in outdoor activities when compared to children of previous generations Clements, 2004; Hofferth & Sandberg, 2001; Karsten, 2005; Tranter & Doyle, 1996; Oliver, Schofield, & Kolt, 2007). The results of this study also suggest that children in the 3 to 5 years age group seemed to be restricted in the quantity of time spent outdoors to less than necessary to achieve the recommended amount of moderate to vigorous physical activity assuming that the majority of this type of physical activity occurs as previous research has indicated (Burdette et al., 2004; Burdette & Whitaker, 2005; Burke, 2005; Graf et al., 2004). Perhaps this restriction, though it may hinder childhood development, makes sense due to the need for higher levels of parental supervision (and therefore, a higher time commitment from increasingly busy parents) when compared to older children. However, in order to encourage healthy levels of physical activity, parents of even young children should encourage and offer opportunities for free play outdoors. Also, since this sample is drawn from southeast and central Texas, the climate may also explain their restricted time outdoors with extremes between heat and cold. However, this trend has been documented across the nation, where children are spending reduced time outdoors when compared to children of previous generations (Clements, 2004; Hofferth & Sandberg, 2001). The results of this study conflict with the findings of Burdette (2004), who reported that children in a Cincinnati study spent a mean of 146 minutes in outdoor free play per day. Most parents in this study reported that their children spent between 30 minutes to 1 hour in outdoor play per day.

Children who participate in outdoor recreation for an hour less than an hour are unlikely to reach the guidelines of at least 60 minutes of vigorous activity since most physical activity in preschool-aged children occurs in the form of outdoor free play (Burdette et al., 2001; Kavey et al., 2003). Even those children who play outdoors for a full hour may not reach the 60 minutes of vigorous activity guidelines since children's free outdoor recreation is characterized only by short bursts of activity with frequent rest periods (Burdette et al., 2004; Kavey et al., 2003).

The relationship found in this study between the time spent in outdoor free play and parents' responses to the PACOR scale supports research that found that parental attitudes had a strong influence on their children's activities (Brown, 1990; Collins et al., 2000; Hutchinson & Baldwin, 2005). However, parental attitudes toward nature and their child's outdoor recreation only accounted for a part of the differences observed in the types of activities in which their children participated.

Children spend more time in outdoor activities when they had parents who also spent more time in outdoor activity (Beets, Vogel, Chapman, Pitetti, & Cardinal, 2007). However, the current study did not measure the amount of time parents actually spent in outdoor activities, which may be an important correlate this study overlooked and one worthy of further investigation. Psychologists have found considerably varying results when analyzing the relationship between attitudes and behavior. Social psychologists have used attitudes as a measurement to predict behaviors for decades. However, many psychologists have suggested that attitudes do not always completely predict behavior, which results in internal conflict and potential for cognitive dissonance (Festinger, 1957; Fishbein & Ajzen, 1975; Glassman & Albarracin, 2006). This is particularly true in the area of health attitudes and actions (Ajzen, 1985). The theory of planned behavior suggests that measuring attitudes is not enough in predicting behavior, but instead the measurement of behavior intentions is necessary. In the case of outdoor recreation and physical activity, children may model their parents' behaviors, which may differ from their parents' attitudes. Parents may not model outdoor recreation and physical activity even though they have positive attitudes toward such activities. This would suggest that a change in parents' own physical activity levels would likely influence a change in the physical activity level of children.

Research found activity levels in children tend to increase as parents' physical activity increases, which might suggest that children model their parents' examples in physical activity (Klesges et al., 1984; Klesges, Malott, Boschee, & Weber, 1986; McKenzie et al., 1991).

It may be the case that while parents are allowing their children to spend time outdoors and have positive attitudes toward such activities, that children do not participate in such activities because their parents do not model outdoor free play to the extent necessary for positive health. The theory of planned behavior may be a better model for predicting children's outdoor play and future research should attempt to measure parental intentions toward their own outdoor activity or play and toward their children's outdoor activity or play.

Programs aimed at improving parents' attitudes toward their childen's outdoor recreation may be beneficial for those children whose parents greatly restrict their outdoor recreation to less than 30 minutes per day by providing children with an alternative role model suggesting physical activity outdoors. Doctors, nurse practitioners, school nurses, and other professionals from whom parents may seek advice or information should try to influence parents by encouraging additional outdoor recreation and teaching parents of the benefits of outdoor recreation or by finding and providing lists of nearby neighborhood safe park spaces in which to inform parents of outdoor recreation and play opportunities. Concerned community groups might offer neighborhood nature-watching dates and other opportunities to help improve nature attitudes of parents within their local area by providing exposure and education about opportunities for activity and fun outdoors.

However, for other parents, simple programs aimed at attitude improvement may not be enough to promote their influence toward their child's outdoor recreation. Future research aimed at investigating parental intentions toward their children's outdoor recreation and the development of programs aimed at improving parental intentions may prove beneficial for increasing understanding of the correlates of children's physical activity accessed through outdoor recreation and play.

Limitations and Suggestions for Future Research

This study is certainly not without limitations. The self-report nature of the study may impact the findings resulting from parents responding in socially desirable ways. Parents are likely to overreport the amount of time children are spending in what they consider to be healthy activities regardless of the actual time spent in those activities. Furthermore, parents are likely to underreport the amount of screen-time in which their children are participating, particularly since the amount of screen time reported by parents in this study does not seem to support recent findings. Responding in socially desirable ways is a potential problem in all survey-based research, although ensuring anonymity and confidentiality is expected to reduce the potential for this problem.

This study, in particular, also seems to be impacted by a ceiling effect, and increasing the possible range of responses in the future may allow a greater variation in responses. Repeating this study with time diaries or as an observational study instead of a survey may also produce richer results that may be less impacted by social desirability. Furthermore, this study limits the potential responses for time spent in various activities, as well as removes the possibility of multi-tasking. Again, time diaries or observational studies may produce richer results in this regard as well. Additional inaccuracies may result from the small sample size in groups for some comparisons. A larger sample of parents responding may yield different results.

Additionally, this study does not address the inherent difference with regards to "outdoor play" and "outdoor recreation." The scale used for this study contained questions related to both

constructs, and a study that investigates the individual components of each construct may be useful in furthering the understanding of why young children engage in various activities and how it is related to their parents attitudes.

Finally, the current study found that although parents seem to have positive attitudes toward nature and toward their children's outdoor recreation, a major difference in the quantity of time spent in those activities does not seem to be present. Some construct other than parents' attitudes toward nature and toward their childen's outdoor recreation is inhibiting parents from allowing their children ages 3 to 5 years old from spending the necessary amount of time in outdoor play that is recommended to achieve physical activity levels for healthy development. Further investigation, perhaps via qualitative methods such as case studies or focus groups, may help to identify this constraint. A study investigating whether or not children are modeling their parents' time spent in free, outdoor play may be helpful in further delineating where differences lie in those who do participate in enough activity for positive health and those who do not meet the recommendations proposed in the previous decade. A final suggestion for future research is to explore a more diverse sample. Although the statistics from this study indicated that the demographic limitation did not impact the results, investigating a more diverse audience may still yield additional insight.

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