

Children's Time Outdoors: Results and Implications of the National Kids Survey

Lincoln R. Larson
Gary T. Green
H. K. Cordell

EXECUTIVE SUMMARY: A growing body of literature suggests that children today are spending less time outdoors than their predecessors. This assertion, however, is confounded by the absence of a baseline for detecting trends in children's activities and time spent outdoors. The U.S.D.A. Forest Service initiated the National Kids Survey to address this problem. This general population random digit dialing telephone survey reached 1,450 U.S. households with children from 2007-2009. A proxy household member (e.g. parent or guardian) age 20 or older spoke for children between the ages 6 and 15. Teens between ages 16 and 19 were interviewed directly. Participants were asked about a variety of topics including time children spend outdoors, common outdoor activities, and reasons for not spending time outdoors. Data showed that, in general, most children (> 62.5%) spent at least two hours outdoors daily. Results also indicated that children spent either more time (39.5%) or about the same amount of time (44.8%) outdoors this year as they did last year. Males, younger children, and Hispanics spent more time outside than other demographic groups. Playing or simply hanging out was the most common outdoor activity (84.0% of respondents). Other common activities included biking, jogging, or running (79.9%) and using electronic media outdoors (65.3%). Children participated in outdoor nature-based activities less frequently than many alternatives. Interest in other activities such as listening to music, art, or reading (57.0%), watching TV, DVDs, or playing video games (48.1%), and using electronic media including internet and texting (47.8%) were the most common reasons for not spending time outside. African American and Hispanic respondents cited more reasons for not going outside than other racial/ethnic groups. Comparisons using contingency coefficients showed that children's outdoor time on weekdays, weekend days, and time spent outdoors relative to last year were strongly correlated with the amount of time their parents/guardians were spending outdoors. Results suggest that, contrary to popular beliefs, many children today are spending a substantial amount of time outdoors. However, the nature of children's outdoor time may be changing. For example, playing or hanging out, physical activities, and technology-centered activities are more popular than nature-based activities. Electronic media consumption and parental involvement in outdoor recreation activities seem to be important factors influencing children's time outdoors.

Future research efforts should continue to monitor these trends and measure the frequency and type of children's outdoor activities across diverse recreation settings. To remain relevant in the lives of American youth, park and recreation professionals could use instruments such as the National Kids Survey to adapt current services and develop innovative outdoor recreation opportunities that appeal to multiple audiences.

KEYWORDS: Children, leisure time, National Kids Survey, nature-deficit disorder, outdoor recreation, technology

AUTHORS: Lincoln R. Larson is with the Warnell School of Forestry & Natural Resources, University of Georgia, Athens, GA, 30602-2152, Phone: (919) 724-2443, Email: LarsonL@warnell.uga.edu. Gary T. Green is with the Warnell School of Forestry & Natural Resources, University of Georgia. H. K. Cordell is with the USDA Forest Service

ACKNOWLEDGMENTS: The authors wish to acknowledge the contributions to this manuscript of Ms. Becky Stephens of the Shelton Group and Dr. Mark Fly and Susan Schexnayder of the Human Dimensions Lab at the University of Tennessee, Knoxville.

Children derive a variety of benefits from spending time outdoors. For instance, outdoor activities can help strengthen children's physical health (Maller, Townsend, Pryor, Brown, & St. Leger, 2006; Sallis, Prochaska, & Taylor, 2000), mental health (Burdette & Whitaker, 2005b; Taylor, Kuo, & Sullivan, 2001; Taylor & Kuo, 2009), conservation attitudes (Chawla, 2006; Wells & Lekies, 2006), academic achievement (Coyle, 2010), and social relationships (Ginsburg, 2007). Given these diverse benefits, it is not surprising that many organizations (e.g., Children and Nature Network, No Child Left Inside Coalition) are now exclusively devoted to increasing children's time outside. Park and recreation professionals, recognizing the value of outdoor recreation, have also worked to validate the important contributions of parks and public green space to healthy lifestyles, with a major focus on children (Kellert, 2005; Sherer, 2006). This enhanced emphasis on the child-nature relationship has been echoed by the U.S. government, which recently launched an agenda to make the outdoors relevant in lives of children across the nation (America's Great Outdoors Report, 2011).

Research on Children's Time Outdoors

The movement to reconnect children and nature is fueled by the assumption that today's kids are spending less time outside than their predecessors. Although researchers have provided anecdotal and empirical evidence to support a decline in Americans' participation in outdoor leisure and recreation (Louv, 2008), few studies have systematically investigated trends in children's time outdoors on a large geographic scale. For example, archived records and historical analyses have been used to assess changes in children's outdoor play in several different cities including New York (Gaster, 1991; Wridt, 2004) and Amsterdam (Karsten, 2005). These investigations suggest that children's time outdoors has declined for a variety of reasons, but findings are based on personal reflections from relatively small, localized samples. Clements's (2004) national survey of U.S. mothers asked participants to compare their outdoor play during childhood with that of their own children. She noted marked declines in active outdoor play across generations, but her conclusions were also constrained by potential generational recall bias and nostalgia associated with adults reflecting on their past. More compelling and objective evidence to indicate that children's time outdoors is declining comes from time diary research studies

that, over several decades, have periodically documented the discretionary time activities of children ages 6-12 (Juster, Ono, & Stafford, 2004; Hofferth, 2009; Hofferth & Sandburg, 2001). Although these studies highlight reduced outdoor time and declining outdoor activity participation in the home environment among American youth, generalizations are somewhat limited because of a focus on general free-time leisure (not outdoor time), coarsely defined activity categories, and a lack of comparability between repeated measures due to changes in instrument structure and seasonal variation across samples (Charles & Louv, 2009).

Annual studies conducted by the Outdoor Foundation reveal a similar pattern. These reports show decreasing participation rates in outdoor activities for youth ages 6-17 each of the past four years, from about 76% of youth participating in 2006 to about 60% participating in 2009 (Outdoor Foundation, 2008, 2009, 2010). The latest iteration of the U.S. Fish and Wildlife's Services National Survey of Fishing, Hunting, and Wildlife-associated Recreation mirrors these findings, noting a 9% decrease from 1995 to 2005 in participation among U.S. sportspersons and wildlife watchers between ages 6 and 15 (USFWS, 2006). However, both of these studies focus specifically on outdoor sports activities (e.g. camping, fishing, hiking, hunting) and not children's overall time outdoors. Because youth derive many benefits from simply being outdoors and not necessarily participating in outdoor recreation activities (Burdette & Whitaker, 2005b; Charles, Louv, Bodner, Guns, & Stahl, 2009), this is an important distinction to make. Though existing literature suggests that children's outdoor play and outdoor recreation activities—particularly those that are nature-based—may be declining, an updated study is needed to address multiple limitations and begin to assess changes in children's outdoor time on a national scale.

Many people who argue that children's outdoor leisure time is decreasing cite another trend that is well documented: the concurrent rise of communications and entertainment media in the lives of kids (Zaradic & Pergams, 2007). Research from the Kaiser Foundation has tracked children's use of electronic media over the past decade. Results indicate that in 2009 children ages 8-18 engaged in over seven hours of media time (e.g., watching TV, listening to music, using Internet/computer, playing video games) each day, a substantial increase over previous years (Rideout, Foehr, & Roberts, 2010). Total media use was highest among African Americans, Hispanics, and teens. Elevated levels of media exposure could compete with children's desire and time to go outside. For example, Pergams and Zaradic (2006) suggested that the rise in electronic entertainment media is correlated with a decline in per capita national park visits among adults. Anderson, Economos, and Must (2008) also discovered an inverse relationship between children's screen time and levels of active play. Other researchers, however, have shown that media saturation might not directly influence the amount of time children spend outdoors (Burdette & Whitaker, 2005a; Vandewater et al., 2007), possibly because children are now capable of doing both things simultaneously. Considering these conflicting results and the increasing mobility of electronic media, the relationship between the use of electronic devices and children's time outdoors remains uncertain.

Although the value of children's time outdoors cannot be disputed, the absence of an objective baseline for detecting trends in children's time spent outdoors has confounded popular interpretations of reported declines in outdoor recreation participation levels (Charles & Louv, 2009). To address this problem, the U.S.D.A. Forest Service developed the National Kids Survey. The goal of the National Kids Survey was to build a national baseline regarding children's time outdoors and to determine what kids are or are not doing outside, including factors that affect children's outdoor activity choices. Specifically, this study was designed to address several research questions that will help researchers and park and recreation professionals understand patterns in children's outdoor time across demographic (gender, age, and racial/ethnic) groups:

RQ1: How much time are children spending outside?

RQ2: How does children's time outside this year compare to the previous year?

RQ3: What are the most popular outdoor activities for children?

RQ4: What are the reasons that children do not spend more time outdoors?

RQ5: What is the relationship between time spent outdoors for parents/
guardians and their children?

Method

Children's time outdoors was examined with the National Kids Survey, a module of questions designed to provide more information about children's time outdoors (Cordell, Betz, Green, & Dunleavy, 2009). The National Kids Survey was conducted as part of a general population, random-digit-dialed, in-the-home telephone survey of more than 120,000 households across the United States. Telephoning targeted a random, cross-sectional sample of non-institutionalized U.S. residents age 16 years or older. The person with the most recent birthday was selected for interviewing. Teens between the ages 16 of 19 were interviewed directly. A proxy household member (e.g., parent, guardian, older sibling) age 20 years or older was interviewed to speak for the child between the ages of 6 and 15 who had most recent birthday. Researchers in the Human Dimensions Research Laboratory at the University of Tennessee-Knoxville conducted the household interviews almost daily from September 2007 to August 2009. The computer-assisted system helped trained interviewers automatically code and enter data as telephone interviews were conducted. The average length of an interview was restricted to 14 minutes, with questions related to children's outdoor time representing a subset of the total interview time. Data continues to be collected, but the sample analyzed in this paper came from a screen of approximately 3,000 households, which resulted in a sample of 1,450 youth (response rate = 48.3%). Throughout this paper, the term "children" refers to all youth included in the survey (ages 6-19). Specific age categories are explicitly mentioned as necessary to highlight specific comparisons.

Within the National Kids Survey, participants were asked about a variety of topics including time children spend outdoors (during the past week, weekdays), common outdoor activities, and reasons for not spending time outdoors. Example questions regarding time outdoors included: "To the best of your knowledge, how much time did this young person spend outdoors on a typical week day this past week?" and "In your opinion, does this young person spend less, about the same, or more time outdoors now than they did this time last year?" The multiyear time span for data collection also allowed for direct assessments of changes in children's outdoor time across two ten-month periods within the sample (September 2007 to July 2008 and July 2008 to April 09). These two periods were roughly equivalent in that they both included weeks within all four seasons of the year. In this study, outdoor time was assumed to encompass all of a child's time spent outside (including home, neighborhood, school, sporting events, etc.).

Outdoor activities were captured with the following question: "During the past week, which of the following types of outdoor activities did this young person participate in?" Respondents were asked to choose all that applied from a list of 17 general activity categories (including an open-ended option). These categories, based on preliminary pilot tests, included active and passive outdoor activities with varying degrees of structure. Respondents were also asked to identify their or their children's primary (most time spent—one choice allowed) and favorite (most enjoyed—two choices allowed) outdoor activities. Reasons for not spending time outdoors were addressed with this question: "Which of the following are reasons why this young person doesn't spend more time outdoors than they already do?" Respondents could again check all answers that applied and provide other reasons as necessary through the open-ended option.

Data Analysis

Prior to analysis, all data were weighted to account for any over or under-representation of gender, age, race/ethnicity, education, or place of residence relative to general population proportions based on U.S. Census estimates for each data-collection year (e.g., U.S. Census Bureau, 2007). Data weighting occurred in two steps. The first stage weight, applied to all respondents age 16 years or older, was calculated using the product of interim weights

based on gender (male, female), age (16-24, 25-34, 35-44, 45-54, 55-64, 65 years and older) and race/ethnicity (White, Black or African American, American Indian, Asian American, Hispanic or Latino) categories. These designations produced a total of $6 \times 2 \times 5 = 60$ strata, with each individual being placed into one of these 60 categories. The demographic weights were then multiplied by additional weights based on educational attainment (less than high school, high school graduate, some college, bachelor's degree, and post-graduate degree) and place of residence (metro or non-metro), resulting in a single weight for each individual respondent in the sample. The second stage weight for the National Kids Survey built upon the first stage weight to account for gender (male, female) and age (6-9, 10-12, 13-15, 16-19 years) ratios for youth ages 6-19. This second weighting variable provided an adjustment to align sample proportions of children with corresponding Census strata. Final weights were therefore normalized ratios of National Kids Survey to U.S. Census strata proportions, creating a balanced sample that was not over or underrepresented by any particular group (Table 1).

Data were analyzed using SPSS (SPSS, 2008). Chi-square tests of independence were used to compare time spent outside, activity participation, and reasons for not spending time outside among different demographic groups. Contingency coefficients (symmetrical matrices) and the Cramer's V statistic (asymmetrical matrices) were used to examine the relationship between children's time outdoors and the outdoor time of their parents/guardians.

Table 1

Demographic Characteristics of National Kids Survey (NKS) Sample Before Weighting (N = 1450)

Variable	N	Portion of Valid NKS Sample (%)	Portion of U.S. Population (%) ^a
Gender			
Males	741	51.3	49.1
Females	703	48.7	50.9
(missing)	6		
Age			
6-9 year olds	420	29.0	29.1
10-12 year olds	316	21.8	21.9
13-15 year olds	305	21.2	21.2
16-19 year olds	405	27.9	27.9
(missing)	4		
Race/Ethnicity			
White	875	61.1	62.6
Black	197	13.8	12.3
Hispanic	284	19.8	12.5
Other	76	5.3	12.5
(missing)	18		

^a Estimated U.S. population percentages based on 2000 Census Data (U.S. Census Bureau, 2000). Weights for all strata in the sample were updated annually to account for demographic changes.

Results

Time Spent Outdoors

Data showed that, in general, most children were spending at least two hours of time outdoors daily during the week preceding the household interview (62.5 % of children spent two or more hours outdoors on a weekday, 78.2% on a weekend). Children generally spent more time outside on weekends, and about one-half (51.3%) of the children spent four or more hours outdoors on a typical weekend day. Less than five percent of children reported spending no time outdoors on either a weekday or a weekend (Figure 1).

Boys tended to spend more time outside than girls did on both weekdays, $\chi^2 = 28.0$ (df = 5), $p < 0.001$, and weekend days, $\chi^2 (5, 1433) = 28.9, p < 0.001$ (Table 2). The percentage of boys spending two or more hours outdoors was higher than girls for weekdays (67.6% of boys vs. 57.0% of girls) and weekend days (81.4% vs. 74.9%). Girls were more likely than boys to spend less than one-half hour outdoors on both weekdays (8.2% of girls vs. 6.0% of boys) and weekend days (7.8% vs. 5.0%).

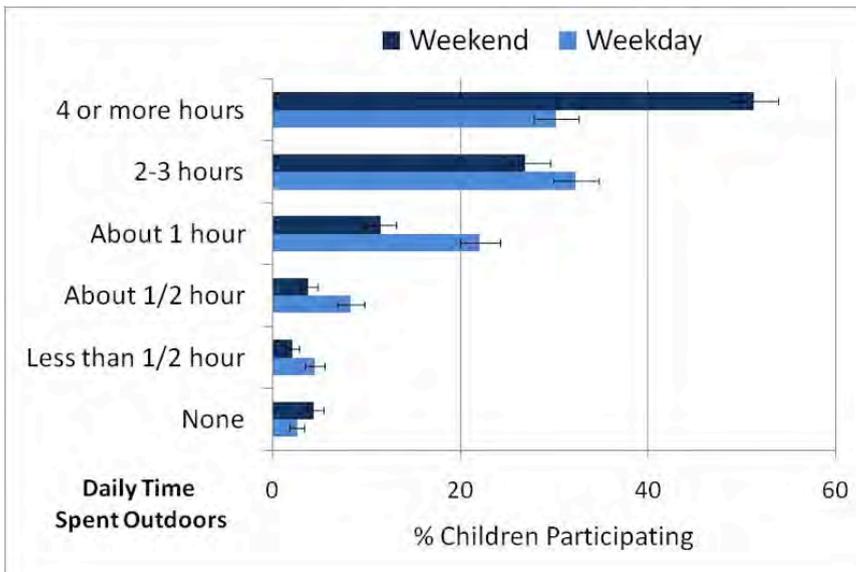


Figure 1. Children's time spent outdoors (with 95% CI). (Source: National Kids Survey, interview dates = 9/15/07 to 8/16/09, N = 1,437)

Children's time outside was also significantly different among the different age groups for both weekdays, $\chi^2 (15, 1434) = 30.1, p < 0.001$, and weekend days, $\chi^2 (15, 1434) = 89.8, p < 0.001$ (Table 2). Younger children (ages 6-9 and 10-12) spent more time outside on weekend days than children age 13 or older (Table 3). Weekday time outdoors was highest for children ages 13-15 (69.2% spent two or more hours outside), but lowest for children ages 16-19 (59.0% spent two or more hours outside). More children ages 16-19 spent less than one-half hour a day outdoors compared to children in the other age groups (Table 3).

Significant differences in children's time outdoors also emerged among racial/ethnic groups for both weekdays, $\chi^2 (15, 1421) = 41.4, p < 0.001$, and weekend days, $\chi^2 (15, 1421) = 38.1, p = 0.001$ (Table 4). In general, Hispanic youth spent more time outside on both weekdays (68.0% spent two or more hours outside) and weekends (87.8% spent two or

Table 2

Children's Time Outdoors (on both Weekdays and Weekend Days) by Gender (with % of Total Children in Category)

Gender (by Day)	Time Spent Outdoors Each Day					
	None	Less than 1/2 hour	About 1/2 hour	About 1 hour	2-3 hours	4 or more hours
Weekdays						
Boys	2.8	3.2	7.2	19.2	32.1	35.5
Girls	2.3	5.9	9.4	25.4	32.4	24.6
Weekend Days						
Boys	4.2	0.8	3.4	10.2	24.2	57.2
Girls	4.5	3.3	4.2	13.1	29.9	45.0

Source: National Kids Survey. Interview dates: 9/15/07 to 8/16/09.

Gender sample sizes: boys (n = 739), girls (n = 694); total N = 1,433

Table 3

Children's Time Outdoors (on both Weekdays and Weekend Days) by Age Group (with % of Total Children in Category)

Age (by Day)	Time Spent Outdoors Each Day					
	None	Less than 1/2 hour	About 1/2 hour	About 1 hour	2-3 hours	4 or more hours
Weekdays						
6-9 year olds	2.1	3.8	8.6	26.0	33.7	25.8
10-12 year old	3.2	2.6	6.4	23.6	31.0	33.2
13-15 year olds	1.7	4.3	8.6	16.2	36.4	32.8
16-19 year olds	1.7	4.3	8.6	16.2	36.4	32.8
Weekend Days						
6-9 year olds	3.3	7.2	9.3	21.3	28.5	30.5
10-12 year olds	2.4	1.3	1.7	8.9	29.7	55.7
13-15 year olds	3.8	1.0	4.2	6.1	27.2	57.7
16-19 year olds	2.7	1.0	4.0	11.0	29.2	52.2
	8.3	4.3	5.8	19.0	22.3	40.5

Source: National Kids Survey. Interview dates: 9/15/07 to 8/16/09.

Age group sample sizes: ages 6-9 (n = 419), ages 10-12 (n = 313), ages 13-15 (n = 302), ages 16-19 (n = 400); total N=1,434

Table 4

Children's Time Outdoors (on both Weekdays and Weekend Days) by Racial/Ethnic Group (with % of Total Children in Category)

Race/ Ethnicity (by Day)	Time Spent Outdoors Each Day					
	None	Less than 1/2 hour	About 1/2 hour	About 1 hour	2-3 hours	4 or more hours
Weekdays						
White	1.9	5.2	9.5	22.3	33.4	27.7
Black	3.6	2.0	10.2	20.4	31.1	32.7
Hispanic	2.1	4.9	4.2	20.8	30.3	37.7
Other	9.1	1.3	6.5	29.9	28.6	24.7
Weekend Days						
White	4.2	2.3	4.2	12.0	25.9	51.4
Black	6.6	2.6	4.1	12.2	27.0	47.4
Hispanic	2.5	0.7	1.8	7.2	27.7	60.1
Other	7.9	1.3	6.6	21.1	32.9	30.3

Source: National Kids Survey. Interview dates: 9/15/07 to 8/16/09.

Racial/ethnic group sample sizes: White (n = 864), Black (n = 196), Hispanic (n = 284), Other (n = 77); total N = 1,421

more hours outside) relative to other groups. The greatest shift in hours per day outdoors was for White children spending four or more hours outdoors, whose numbers increased from 27.7% outdoors on weekdays to 51.4% outdoors on weekend days.

Time Spent Outdoors This Year Compared to Last Year

Results suggested that children were spending either more time (39.5%) or about the same amount of time (44.8%) outdoors this year compared to last. More boys (43.2%) displayed an increase in time outdoors than girls (35.7%), while more girls (17.4%) displayed a decline than boys (13.8%), $\chi^2(2, 1433) = 9.3, p = 0.010$. Fewer children ages 6-12 (13.5%) reported a decrease in time spent outdoors this year compared to last than children ages 13-19 (17.9%), $\chi^2(6, 1434) = 15.8, p = 0.015$. Relative to other groups, more Hispanic children (55.0%) spent additional time outside this year compared to last, $\chi^2(6, 1421) = 68.0, p < 0.001$. A larger percentage of African American children (21.5%) exhibited a decrease in outdoor recreation time compared to other groups.

Comparisons between the two sampling periods showed that the percentage of children spending two to three (33.0% vs. 30.2%) and four or more hours (28.6% vs. 30.4%) outside on weekdays remained relatively constant between 2007 and 2009. On weekends, the percentage of children spending two to three hours (27.7% in 2007-08 vs. 26.6% in 2008-09) and four or more hours (47.0% vs. 51.7%) outdoors also displayed little change. Short-term trends indicated a modest decline between 2007 and 2009 in the percentage of children who did not spend any time outdoors on weekdays (4.6% in 2007-08 vs. 1.1% in 2008-09) and weekend days (6.2% vs. 3.3%).

Most Common Outdoor Activities

Respondents indicated that playing or simply hanging out was children's most common outdoor activity (84.0%), followed by active outdoor activities such as biking, jogging, or running (79.9%), and using electronic media outdoors (65.3%). Outdoor, nature-based

activities such as bird watching and wildlife viewing (30.7%) or hiking, camping, and fishing (29.0%) were not as common among youth as other alternatives (Table 5). When respondents were asked to identify the single activity that occupies a majority of their or their child's outdoor time, hanging out or playing outdoors (24.4%), land-based sports (22.1%), and physical activities such as biking, jogging, or walking (20.4%) were by far the most frequent responses. Nature-based activities (e.g., hiking, camping, wildlife viewing) were the primary activity for just 5.4% of children. Even though the use of electronic devices outdoors was among the most commonly reported activities, it was the primary activity for only 2.8% of children. When asked to select children's favorite activities, respondents indicated that hanging out or playing with friends (25.5%), land-based sports (25.2%), physical activities such as biking, jogging, or walking (16.1%), and water-based activities such as swimming (8.1%) were the most enjoyed. Nature-based activities were the favorite activities for only 5.6% of respondents.

Gender comparisons showed that more boys than girls went outdoors to just play or hang out (88.1% of boys vs. 79.9% of girls), participate in team sports (61.1% vs. 37.8%), and ride motorcycles, ATVs, and other off-road vehicles (23.8% vs. 15.0%). Girls were more likely to be outside reading or studying compared to boys (52.1% of girls vs. 39.8% of boys; Table 5). When asked about favorite activities, boys showed a stronger affinity than girls for land-based sports (30.4% of boys vs. 19.7% of girls) and nature-based activities (7.9% vs. 3.0%). Girls favored water-based activities like swimming more than boys (10.4% of girls vs. 6.2% of boys).

Age comparisons showed that more children ages 6-12 than children ages 13-19 played or hung out outdoors (92.5% of ages 6-12 vs. 75.9% of ages 13-19) and participated in outdoor physical activities such as biking, jogging, or walking (84.3% vs. 75.7%; Table 5). Children ages 13-19 were more likely than children ages 6-12 to listen to music, watch movies, or use electronic devices outside (78.6% of ages 13-19 vs. 52.8% ages 6-12). More children ages 13-15 (58.9%) played or practiced team sports, but fewer children ages 13-15 (37.5%) participated in reading or studying outdoors relative to the other age categories. Bird watching and wildlife viewing were more common among children ages 6-9 (39.8% participating) and 10-12 (40.8%), significantly higher than children ages 13-15 (22.5%) or 16-19 (19.4%). Motorized outdoor activities (e.g., riding motorcycles, ATVs, boating, jet skiing) were more common among children ages 13-19 (23.1% participating) than children ages 6-12 (16.4%). In terms of favorite activities, children ages 6-9 (34.8%) preferred just hanging out or playing outdoors more than other groups. Swimming was more popular among children ages 6-12 (preferred by 11.6%) than children ages 13-19 (4.3%). Sports gradually increased in popularity until age 15, reaching a peak in children ages 13-15 (preferred by 31.7%) before dropping in children ages 16-19 (22.5%). The use of electronic devices outdoors was more popular among children ages 13-19 (preferred by 5.1%) than children ages 6-12 (1.4%).

Racial/ethnic differences in outdoor recreation generally suggested that Hispanic and White children were engaged in a larger variety of activities than African American children or children from other ethnic backgrounds (Table 5). For example, Hispanic children (87.8%) displayed the highest levels of land-based physical activities (e.g., biking, jogging, walking), ten percentage points higher than any other racial/ethnic group. Children from all minority groups (56.5%) were more involved in team sports than White children (45.5%). However, White children demonstrated the highest levels of participation in motorized sports on land (22.6%) and water (10.7%). Nature-based activities were more common among White (33.9% hiked, camped, fished; 31.2% participated in wildlife viewing) and Hispanic (28.4% hiked, camped, fished; 40.0% participated in wildlife viewing) children than African American children (12.1% hiked, camped, fished; 18.9% participated in wildlife viewing). Using electronic devices outside was the only activity more common among African American children (76.5%) than the other racial/ethnic groups. In terms of favorite activities, more African American (36.7%) and Hispanic children (27.6%) preferred sports than children in the other categories (White = 22.7%, Other = 11.0%). Hanging out or playing outdoors was the most popular among African Americans (34.7%)

Table 5

Most Common Outdoor Activities for Children ages 6 to 19 (by Demographic Groups) (N=1421)

Outdoor Activity	Total Children Participating (%)	Gender Diff^a	Age Diff^b	Ethnic Diff^c
Just playing or hanging out	84.0	^B ***	^6-9, 10-12 ***	
Biking, jogging, walking, skate boarding, etc.	79.9		^6-9, 10-12 ***	^H **
Listening to music, watching movies, or using electronic devices	65.3 ^d		^16-19, 13-15 ***	^B, H ***
Playing or practicing team sports	49.8	^B ***	^13-15, 10-12 **	^H, B, O **
Reading or studying while sitting outdoors	45.8	^G ***	^10-12, 16-19 ***	^H, O ***
Playing other sports (golf, tennis, etc.)	37.9		^6-9, 10-12 ***	
Attending camps, field trips, and outdoor classes	36.7	^G *	^6-9 *	^H, O *
Swimming, diving, snorkeling, etc.	33.2			^W, H *
Bird watching, wildlife viewing, etc.	30.7		^6-9, 10-12 ***	^H, W ***
Hiking, camping, fishing, etc.	29.0		^6-9 *	^W, H ***
Riding motorcycles, ATVs, other off-road vehicles	19.5	^B ***	^16-19, 13-15 **	^W **
Boating, jet skiing, water skiing, etc.	8.4			^W ***
Snow skiing, snowboarding, cross country-skiing	8.8			^W **
Rowing, kayaking, canoeing, surfing, etc.	7.8		^10-12, 6-9 *	^H, W **
Other outdoor activities	5.8		^10-12, 13-15, 16-19 **	

*, **, *** denotes significance of chi-square test at $\alpha = 0.05, 0.01, \text{ and } 0.001$ respectively

^a Significant differences between genders reported. (^ = more, B = boys, G = girls)

^b Significant differences between age groups reported. (^ = more, age groups = 6-9, 10-12, 13-15, and 16-19 year olds)

^c Significant differences between racial/ethnic groups reported. (^ = more, B = black, H = Hispanic, W = White, O = other)

^d Item was added to survey during data collection (n = 917)

Source: National Kids Survey. Interview dates: 9/15/07 to 8/16/09

and children in the Other category (38.3%). White children preferred nature-based activities (7.4%) and motorized outdoor activities (7.3%) more than kids in other racial/ethnic groups (aggregate group means of 2.9% and 1.2%, respectively). Physical activities such as biking, jogging, or walking were the only outdoor activities preferred more often by children in the Other category (28.8%) than children in other groups.

Reasons for Not Spending More Time Outdoors

Respondents indicated that general interest in other activities was the most common reason for children not spending time outside (Table 6). Specifically, listening to music, art, or reading (57.0% of respondents), watching TV, DVDs, or playing video games (48.1%), and using electronic media such as internet and texting (47.8%) were the most commonly cited reasons. Participation in indoor sports (34.9%) was also listed as a reason for not being outside. Neighborhood access to outdoor recreation locations (27.7%), lack of transportation (20.7%), and safety concerns (12.9%) were less common but significant reasons that children did not spend time outdoors. About one-half (49.4%) of the participants cited other reasons children did not go outside, most commonly weather-related issues and a lack of time because of homework or school commitments.

For boys, the most commonly cited reason for not being outside more often was an interest in video games, DVDs, and TV (56.2% of boys vs. 39.9% of girls). For girls, listening to music, art, and reading (63.2% of girls vs. 51.2% of boys) and playing on the Internet and text messaging (54.3% vs. 42.0%) were more common reasons for not going outside (Table 6). Girls were also more likely than boys to list playing indoor sports (41.2% of girls vs. 29.2% of boys) and spending time at the mall (26.5% vs. 19.8%) as reasons for not being outdoors. Interestingly, slightly more boys than girls avoided outdoor time because they did not feel safe or because they were injured or suffering from health problems. Poor neighborhood access and lack of transportation, though not a primary obstacle to outdoor recreation, were equally problematic for both genders.

Children ages 10-19, especially those in the 13-19 age category, were more likely than younger children to list interest in the internet or text messaging (57.8% of ages 13-19 vs. 24.9% of ages 6-12) as a reason for not going outside. Video, games, DVDs, and TV were more significant distractions for children ages 10-15 (56.6%) than for their older or younger counterparts (42.5%). Involvement in indoor sports was a substantial reason for not participating in outdoor activities for children ages 13-19 (42.3%). Spending time at the mall, shopping, and hanging out were major reasons children ages 16-19 did not spend time outside (48.2% compared to 29.4% for ages 13-15, 8.4% for ages 6-12). Lack of transportation appeared to be a more prominent issue for children ages 13-15, and safety was a larger concern for children ages 10-12.

In general, compared to White children, African American and Hispanic respondents listed many more reasons children do not go outside (Table 6). For example, the percentage of African American children whose outdoor time was impacted by video games, DVDs, and TV (57.2%) or internet and text messaging (61.1%) was higher than any other group. Spending time at the mall, shopping, and hanging out were also commonly cited by African Americans (39.5%) as reasons children do not go outside. Although neighborhood access was a larger concern for African American children (36.5%) than other racial/ethnic groups, lack of transportation appeared to be a larger concern among Hispanics (26.1%). Safety and injury/health concerns were more prevalent among Hispanics (22.7%) than other groups, and more common among minorities in general. Other reasons for not spending time outside (e.g., school activities or homework) were listed most often for children in the Other racial/ethnic category (67.1%).

Results provided other evidence that technology-related activities may affect children's time outdoors. Children's time outside on weekends appeared to be significantly influenced by the presence of a computer in their rooms (Cramer's $V = 0.158$, $p < 0.001$). More children with a computer in their room (9.1%) spent less than one-half hour outside on an average weekend day than children without a computer in their room (5.6%). Additionally, significantly more children without a computer (81.5%) spent two or more hours outdoors outside on weekend days compared to children with a computer (68.6%).

Table 6*Reasons Children Do Not Spend Time Outdoors (by Demographic Groups) (N-1432)*

Reason	Total Children Affected (%)	Gender Diff ^a	Age Diff ^b	Ethnic Diff ^c
Interested in listening to music, art, reading, etc.	57.0	^G ***	^10-12 ***	^B, H *
Interested in video games, DVDs, and TV	48.1	^B ***	^10-12, 13-15 ***	^B *
Interested in Internet, text messaging, etc.	47.8	^G ***	^13-15, 16-19 ***	^B, H ***
More involved in indoor sports	34.9	^G ***	^13-15 **	^B, H **
Neighborhood does not have good access	27.7			^B *
Spend time at mall, shopping, hanging out	23.0	^G **	^16-19, 13-15 ***	^B ***
Don't have anyone to play outdoors with	21.4			
Don't have transportation	20.7		^13-15 ***	^H *
It is not safe to play or do sports outside	12.9	^B **	^10-12 ***	^H, B ***
Was injured or developed a health problem	8.5	^B **	^13-15, 16-19 **	^H ***
Other reasons time not spent outdoors	49.4 ^d	^G ***	^10-12, 16-19 *	^O ***

*, **, *** denotes significance of chi-square test at $\alpha = 0.05, 0.01, \text{ and } 0.001$ respectively

^a Significant differences between genders reported. (^ = more, B = boys, G = girls)

^b Significant differences between age groups reported. (^ = more, age groups = 6-9, 10-12, 13-15, and 16-19 year olds)

^c Significant differences between racial/ethnic groups reported. (^ = more, B = black, H = Hispanic, W = White, O = other)

^d Most common responses for write-in item were school activities/homework and weather

Source: National Kids Survey. Interview dates: 9/15/07 to 8/16/09.

Children with TVs in their rooms also spent less time outside on weekends (Cramer's $V = 0.089$, $p = 0.047$). On weekdays, the presence of a TV in a child's room was the only technology factor inversely related to the amount of time that child spent outdoors (Cramer's $V = 0.133$, $p < 0.001$).

Time Spent Outdoors: Comparing Parents/Guardians and their Children

Most interviews in the National Kids Survey (72.1%) were conducted with a parent/guardian of the specific child, allowing for direct comparisons of time outdoors for adults and their children. Contingency coefficients (C) showed that children's outdoor time on weekdays ($C = 0.399$, $p < 0.001$), outdoor time on weekend days ($C = 0.511$, $p < 0.001$), and time spent outdoors relative to last year ($C = 0.266$, $p < 0.001$) were strongly correlated with the amount of time their parents/guardians were spending outdoors. On weekend days, children who had an adult who accompanied them for outdoor recreation activities were more likely to spend time outdoors than children who did not (Cramer's $V = 0.191$, $p < 0.001$). In fact, 19.7% of children who were not accompanied by an adult for outdoor activities typically spent less than one hour outside each weekend day. For children regularly accompanied by adults, the percent spending less than one hour outside was only 8.1%. Although a similar pattern was observed in weekday time outdoors for children accompanied by adults and those not accompanied by adults, the difference was not statistically significant (Cramer's $V = 0.068$, $p = 0.251$).

Discussion and Implications

Results of the National Kids Survey suggest that, contrary to popular beliefs, many children today are spending a substantial amount of time outdoors. In fact, nearly two-thirds of all children in this sample spent at least two hours outside during the average day. Respondents stated that a majority of the children in their households spent at least as much or more time outside this year than the year before. Reported outdoor activity rates over the two-year survey period also showed no sign of declining and, in some cases, revealed a modest increase. Although the National Kids Survey offers some of the most comprehensive and holistic information regarding children's time outdoors across all environments (e.g., home, neighborhood, school) to date, the findings seem to contrast with other research focused on children's outdoor play and recreation (e.g., Clements, 2004; Hofferth, 2009; Outdoor Foundation, 2010; USFWS, 2006). This apparent contradiction could be explained by an expanded concept of what constitutes outdoor time. When the typical set of outdoor recreation activities (e.g., fishing, hiking, hunting) is broadened and a diverse array of potential outdoor leisure opportunities are considered, America's children are still going outside. This emerging pattern parallels existing research focused on adults. These reports based on the U.S. Forest Service's National Survey on Recreation and the Environment indicate that overall outdoor recreation participation in America may actually be on the rise, with participation trending towards non-traditional activities such as picnics, family gatherings, and driving for pleasure (Cordell, 2008; Cordell, Betz, & Green, 2008). In fact, pilot tests of the National Kids Survey showed that using electronic media outdoors—an activity that was not possible ten years ago—was consistently listed as a popular outdoor activity among children. This item was subsequently included in updated versions of the survey. These patterns suggest that, as the nature of outdoor recreation continues to change, researchers and recreation professionals should adapt and account for new types of outdoor activities. Managers hoping to sustain outdoor recreation at their sites and maintain growth in Americans' time outdoors could pay special attention to what particular groups of children are or are not doing outside (Bruyere, Teel, & Newman, 2009; Kimbell, Schuhmann, & Brown, 2009).

Accounting for Demographic Differences in Children's Outdoor Recreation

An examination of demographic differences in children's time outdoors showed that, in general, boys spend more time outside than girls. Despite the growing popularity of girls' sports in the U.S. (Daniels & Leaper, 2006), boys in this study were more likely to

participate in sports and more likely to rate sports as their favorite outdoor activity. Girls appeared to spend more of their free time than boys indoors at places like malls or doing things like reading, studying, or schoolwork. Specific initiatives, incentives, or promotions may be necessary to encourage more girls to participate in outdoor recreation and engage in outdoor physical activities.

Age differences in children's outdoor time were noticeable as well. Children ages 13-19 displayed lower levels of outdoor recreation participation compared to children ages 6-12, particularly on weekends. Considering the myriad benefits enjoyed by adolescents who spend leisure time outdoors (Larson & Verma, 1999), the decline in outdoor activities as age progresses is concerning. Other research has revealed a similar decrease in children's affinity for nature-related activities at the onset of adolescence (Larson, Green, & Castleberry, 2010). Multiple factors could explain this shift in recreation behavior. Older children often have less free time as schedules become filled with school and family activities (Skar & Krogh, 2009). Children ages 13-19 might also be more inclined to participate in indoor social activities, interacting with peers instead of interacting with nature. For instance, this study showed that text messaging and hanging out at malls were major reasons children ages 13-19 did not go outside. To fulfill adolescents' need for social networking, park and recreation professionals could specifically target teens through outdoor recreation programming that emphasizes peer interactions. Managers could also capitalize on existing social structures within youth communities, partnering with organizations such as churches to get more teenagers outdoors.

Outdoor activity participation and behavior also differed among racial/ethnic groups. For instance, African American children did not appear to spend as much time outdoors as Hispanics or Whites, a trend that has been observed in other studies (e.g., Outdoor Foundation, 2010). Even if they were outdoors, African American children were more likely to be using electronic devices than children from other demographic groups. African American children were also more likely to choose other leisure time activities such as playing with electronic media (especially Internet and video games) and hanging out with friends at the mall over time outdoors. Similar racial/ethnic differences in recreation behavior have been observed in adults (Dwyer, 1994; Johnson, Bowker, English, & Worthen, 1998; Shinew, Floyd, & Parry, 2004), and these cultural norms and values likely influence children's outdoor leisure activities. A lack of access to suitable neighborhood sites and safety concerns, both major constraints to outdoor recreation in minority communities (Grow, Saelens, Kerr, Durant, Norman, & Sallis, 2008; Weir, Etelson, & Brand, 2006), were also cited by African American and Hispanic youth in this study as reasons for not going outside. Park managers should work to address these potential outdoor recreation barriers, providing opportunities for minority children to get outdoors and interact with nature. As the racial/ethnic composition of the U.S. population changes, additional research is needed to build upon this baseline and document the leisure preferences, behaviors, and outdoor time of children in diverse communities (Shinew, Stodolska, Floyd, Hibbler, Allison, & Johnson, 2006).

Developing Diverse Recreation Activities

Although any amount of time outdoors is likely to benefit children to some extent (Burdette & Whitaker, 2005b; Charles et al., 2009), certain activities may offer more advantages than others. For example, in the National Kids Survey and other nationwide studies (e.g., Outdoor Foundation, 2010), parents said that many of their children regularly engage in outdoor physical activities such as biking, jogging, walking, or organized team sports. These activities appeared to be popular across all gender, age, and racial/ethnic groups. Numerous studies have shown that time outdoors is a critical component of physically active and healthy lifestyles and an important antidote to the obesity epidemic currently plaguing America's youth (Cleland, Crawford, Baur, Hume, Timperio, & Salmon, 2008; Roemmich, Epstein, Raja, Yin, Robinson, & Winiewicz, 2006; Sallis, Prochaska, & Taylor, 2000). Therefore, park and recreation managers should continue working to promote physical activities at their sites, helping to ensure that physical activity opportunities are

available and accessible for children in all neighborhoods. Efforts to provide and maintain athletic courts and fields or sponsor regular athletic tournaments for kids could especially benefit minority children, a group who displays a strong affinity for team sports-related activities.

Of some concern, however, is the fact that none of the most commonly referenced outdoor pastimes incorporate direct interaction with nature. Hence, despite positive trends in children's time outdoors, fear of a pervasive shift away from certain nature-based recreation activities could still be warranted. Pergams and Zaradic (2008) highlighted this issue by documenting declines in per capita participation rates for U.S. adults in a number of nature-related recreation activities such as public land visitation, camping, and backpacking. In this study, data for children showed that nature-related activities (e.g. hiking, camping, fishing, wildlife viewing) were not as common as many other alternatives. A reduced role of nature-based recreation could become problematic. Direct play in nature is critical for youth cognitive and social development, especially during middle childhood (Kellert, 2005; Louv, 2008; Taylor & Kuo, 2006). Outdoor experiences during childhood may also contribute to positive attitudes toward outdoor recreation and nature in adulthood (Bixler, Floyd, & Hammitt, 2002; Larson, Whiting, & Green, 2011; Thompson, Aspinall, & Montarzino, 2008; Wells & Lekies, 2006). Other studies have shown that indirect and vicarious experiences with nature, often through the use of technology, are inadequate substitutes for actual time in the natural environment (Duerden & Witt, 2010; Harrington, 2009; Kellert, 2002). Hence, despite the popularity of outdoor activities across age groups, park and recreation professionals should make a concerted effort to increase nature-based recreation opportunities (Charles et al., 2009). Summer camp programs represent one effective strategy for helping children connect with nature (Larson, Castleberry, & Green, 2010). Park managers could also cultivate relationships with local schools to ensure that children get outside and enjoy positive outdoor nature experiences early in their lives.

Researchers have noted another important factor to consider in children's outdoor recreation: the distinction between structured and unstructured outdoor play (Hofferth & Sandburg, 2001). Saturated schedules and reduced leisure time have become a hallmark of the efficient, modern American family. For children, these busy lifestyles primarily consist of structured play opportunities such as organized sports and youth programs (Skar & Krogh, 2009). However, the value of free and unstructured play in promoting children's cognitive, emotional, physical, and social well-being should not be overlooked (Ginsburg, 2007; Louv, 2008). This study suggests that, given the amount of time children spend outdoors, the opportunity for play exists. However, parents must be willing to allow their children to engage in unstructured outdoor activities. Research has shown that safety concerns such as "stranger danger" and the need for adult supervision are often cited by parents as major factor constraining their child's independence and outdoor play, particularly in low income neighborhoods (Karsten, 2005; Timperio, Crawford, Telford, & Salmon, 2004; Veitch, Bagley, Ball, & Salmon, 2006; Weir et al., 2006). Although safety concerns did not emerge as a major reason for avoiding the outdoors among children in this study, data may have been slightly skewed by the number of older respondents (ages 16-19). Safety appeared to be a more substantial issue for younger children and racial/ethnic minorities.

Equally problematic is the recognition that, in contrast to child development experts, parents often view unstructured play activities as less beneficial to children than structured activities (Fisher, Hirsh-Pasek, Golinkoff, & Gryfe, 2008). The parent or guardian's viewpoint is critical because parental involvement and participation in outdoor activities seem to be among the most important factors contributing to children's time outdoors (Chawla, 2006; Outdoor Foundation, 2010). Results from the National Kids Survey confirmed this relationship, providing additional evidence that children's time outdoors is strongly influenced the amount of time their parents or guardians are willing and able to spend with them in outdoor settings. Because the recreation behavior of children and their parents may be relatively inseparable, managers should strive to conceptualize recreation from the family-based perspective.

Combining Technology and Children's Outdoor Recreation

To some extent, the National Kids Survey also suggests that the growing prominence of technology in children's lives will continue to influence their outdoor time. Reports have shown that media consumption currently occupies a major portion of children's free time, and the prevalence of media-driven leisure time seems to be increasing (Rideout et al., 2010). Other researchers have suggested that this "videophilia" may replace outdoor recreation in the lives in many Americans (Louv, 2008; Zaradic & Pergams, 2007). Data from the National Kids Survey generally supports these conclusions. For example, many parents highlighted use of electronic media (e.g., internet, TV, video games, DVDs) as one of the primary reasons children are not spending more time outside. Children's time outdoors was also inversely related to the presence of a personal TV and/or a computer in their rooms, which has been shown to correlate with increased media time (Rideout et al., 2010). Children ages 13-19 and African Americans appeared to be particularly engaged with technology-driven activities, affirming results of other studies (Rideout et al., 2010). However, findings suggest that despite the rising prevalence of electronic media in children's leisure time, America's youth still find time to spend outdoors. In fact, results show that media use and outdoor time may not be mutually exclusive. For example, listening to music, watching movies, and using electronic media outside were among the most commonly reported outdoor activities for children in all demographic groups.

Perhaps park and recreation professionals could integrate children's passion for electronic media with their affinity for the outdoors through technology-centered activities in outdoor settings. Geocaching, for example, has become a popular family-oriented activity that promotes children's interaction with nature (Flett, Moore, Pfeiffer, Belonga, & Navarre, 2010). In an exploratory study with children ages 6-17, Chavez (2009) showed that technology-based outdoor activities (camera safari and geocaching) received more positive votes than outdoor nature activities that were not technology based. Park managers could take advantage of children's propensity for using electronic media outdoors by augmenting existing programs with handheld electronic media connections (e.g., podcasts) to be used on iPods or smartphones. In some places, electronic playground equipment has been built to entice more children to go outside (Lynn, 2010). Covered areas or pavilions with public wireless internet access could also lure more children to parks where, after using electronic devices, they might engage in active or nature-based outdoor recreation. Special outdoor park activities such as movies screenings or public concerts might attract more youth (particularly teens) by catering to their interest in outdoor media consumption. To remain relevant in the lives of children, park and recreation professionals must continue to adapt current services and develop innovative outdoor recreation opportunities that appeal to multiple audiences.

Study Limitations

Several limitations should be acknowledged when interpreting results of this research. First, this study relied heavily upon information about children's leisure time provided by self-reports (for children ages 16-19) or adult proxies (adult caregivers for children ages 6-15). Hence, data may be affected by recall bias or inadequate familiarity with a child's discretionary time. However, this data collection strategy has been effectively employed and interpreted in a variety of other national-level studies (e.g., Outdoor Foundation, 2010; USFWS, 2006). Additionally, though researchers attempted to clarify the broad definition of "outdoor time" in the context of this study, preconceived notions of what it meant to be outdoors may have influenced responses. To address this issue, interviewers provided a list of possible outdoor activities (developed through pilot testing) that helped to minimize confusion associated with potentially different interpretations. The generalizability of a sample and corresponding inferences are a major concern in any national survey, but the systematic data weighting approach outlined above helped adjust sample proportions to reflect ratios in the general U.S. population. It should also be noted that links between parent or guardian time outdoors, technology use, and children's time outdoors are based on correlational evidence, and do not necessarily suggest causal relationships. Despite

these limitations, the results of the National Kids Survey provide an important and unprecedented baseline for measuring the amount and type of time spent outdoors for children across America.

Conclusion

The first iteration of the National Kids Survey indicated that many children in the U.S. are spending a substantial amount of time outdoors. However, the nature of contemporary outdoor time is changing. While familiar outdoor activities such as hanging out or playing with friends and team sports remain popular, novel activities such as using electronic media outdoors are beginning to emerge. To maintain the outdoor recreation participation of children across America, park and recreation professionals may need to embrace the expanding role of technology, especially when targeting particular demographic groups such as teens and African Americans. Managers should find ways to sustain interest in outdoor physical activities and create opportunities for children to renew what appears to be a diminishing connection with nature. As the U.S. population grows and becomes more heterogeneous (Cordell & Overdeest, 2001), the National Kids Survey will provide an invaluable baseline for assessing trends in the outdoor recreation activity patterns of children from different demographic backgrounds. Park and recreation professionals could use instruments such as the National Kids Survey to inform management practices and enhance outdoor experiences for America's youth.

References

- America's Great Outdoors. (2011). *America's Great Outdoors: a promise to future generations*. Retrieved April 30, 2011, from <http://americasgreatoutdoors.gov/report/>
- Anderson, S. E., Economos, C. D., & Must, A. (2008). Active play and screen time in U.S. children aged 4 to 11 years in relation to sociodemographic and weight status characteristics: a nationally-representative cross-sectional analysis. *BMC Public Health*, 8(13), 366-379. doi:10.1186/1471-2458-8-366
- Bixler, R. D., Floyd, M. F., & Hammitt, W. E. (2002). Environmental socialization: Quantitative tests of childhood play hypothesis. *Environment and Behavior*, 34(6), 795-818. doi: 10.1177/001391602237248
- Bruyere, B. L., Teel, T., & Newman, P. (2009). Response to "More Kids in the Woods: Reconnecting Americans with Nature." *Journal of Forestry*, 107(7), 378-379.
- Burdette, H. L., & Whitaker, R. C. (2005a). A national study of neighborhood safety, outdoor play, television viewing, and obesity in preschool children. *Pediatrics*, 116(3), 657-662. doi:10.1542/peds.2004-2443
- Burdette, H. L., & Whitaker, R. C. (2005b). Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Archives of Pediatrics and Adolescent Medicine*, 159(1), 46-50.
- Charles, C., & Louv, R. (2009). *Children's nature deficit: what we know - and don't know*. Retrieved April 30, 2011, from Children & Nature Network: <http://www.childrenandnature.org/downloads/CNNEvidenceoftheDeficit.pdf>
- Charles, C., Louv, R., Bodner, L., Guns, B., & Stahl, D. (2009). *Children and Nature 2009: A report on the movement to reconnect children to the natural world*. Retrieved April 30, 2011, from Children & Nature Network: <http://www.childrenandnature.org/downloads/CNNMovement2009.pdf>
- Chavez, D. J. (2009). Youth day in Los Angeles: Evaluating the role of technology in children's nature activities. *Children, Youth and Environments*, 19(1), 102-124.
- Chawla, L. (2006). Learning to love the natural world enough to protect it. *Barn*, 2, 57-78.
- Cleland, V., Crawford, D., Baur, L. A., Hume, C., Timperio, A., & Salmon, J. (2008). A prospective examination of children's time spent outdoors, objectively measured physical activity and overweight. *International Journal of Obesity*, 32(11), 1685-1693. doi:10.1038/ijo.2008.171

- Clements, R. (2004). An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*, 5(1), 68-80. doi:10.2304/ciec.2004.5.1.10
- Cordell, H. K. (2008). The latest on trends in nature-based outdoor recreation. *Forest History Today*, Spring 2008, 4-10.
- Cordell, H. K., Betz, C. J., & Green, G. T. (2008). Nature-based outdoor recreation trends and wilderness. *International Journal of Wilderness*, 14(2), 7-13.
- Cordell, H. K., Betz, C. J., Green, G. T., & Dunleavy, P. G. (2009). *National Kids Survey Part V: Kids outdoor summary* (Internet Research Information Series Report). Athens, GA: USDA Forest Service Research. Retrieved April 30, 2011, from USDA Forest Service: <http://warnell.forestry.uga.edu/nrrt/nsre/IRISRec/IRISRec18rpt.pdf>
- Cordell, H. K., & Overdeest, C. (2001). *Footprints on the land: An assessment of demographic trends and the future of natural lands in the United States*. Champaign, IL: Sagamore.
- Coyle, K. J. (2010). *Back to school: Back outside!: How outdoor education and outdoor school time create high performance students*. Reston, VA: National Wildlife Federation. Retrieved December 14, 2011, from National Wildlife Federation: <http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Get-Outside/2010/09-01-10-Back-to-School.aspx>
- Daniels, E., & Leaper, C. (2006). A longitudinal investigation of sport participation, peer acceptance, and self-esteem among adolescent girls and boys. *Sex Roles*, 55(11-12), 875-880. doi:10.1007/s11199-006-9138-4
- Duerden, M. D., & Witt, P. A. (2010). The impact of direct and indirect experiences on the development of environmental knowledge, attitudes, and behavior. *Journal of Environmental Psychology*, 30(4), 379-392. doi:10.1016/j.jenvp.2010.03.007
- Dwyer, J. F. (1994). *Customer diversity and the future demand for outdoor recreation (General Technical Report RM-252)*. Fort Collins, CO: USDA Forest Service, North Central Forest Experiment Station.
- Fisher, K. R., Hirsh-Pasek, K., Golinkoff, R. M., & Gryfe, S. G. (2008). Conceptual split? Parents' and experts' perceptions of play in the 21st Century. *Journal of Applied Developmental Psychology*, 29(4), 305-316. doi:10.1016/j.appdev.2008.04.006
- Flett, M. R., Moore, R. W., Pfeiffer, K. A., Belonga, J., & Navarre, J. (2010). Connecting children and family with nature-based physical activity. *American Journal of Health Education*, 41(5), 292-300.
- Gaster, S. (1991). Urban children's access to their neighborhood: Changes over three generations. *Environment and Behavior*, 23(1), 70-85. doi:10.1177/0013916591231004
- Ginsburg, K. R. (2007). The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*, 119(1), 182-191. doi:10.1542/peds.2006-2697
- Grow, H. M., Saelens, B. E., Kerr, J., Durant, N. H., Norman, G. J., & Sallis, J. F. (2008). Where are youth active? Roles of proximity, active transport, and built environment. *Medicine and Science in Sports and Exercise*, 40(12), 2071-2079. doi:10.1249/MSS.0b013e3181817baa
- Harrington, M. C. R. (2009). An ethnographic comparison of real and virtual reality field trips to Trillium Trail: the salamander find as a salient event. *Children, Youth and Environments*, 19(1), 74-101.
- Hofferth, S. (2009). Changes in American children's time, 1997-2003. *International Journal of Time Use Research*, 6(1), 26-47.
- Hofferth, S., & Sandburg, J. F. (2001). How American children spend their time. *Journal of Marriage and the Family*, 63(2), 295-308. doi:10.1111/j.1741-3737.2001.00295.x
- Johnson, C. Y., Bowker, J. M., English, D. B. K., & Worthen, D. (1998). Wildland recreation in the rural south: An examination of marginality and ethnicity theory. *Journal of Leisure Research*, 30(1), 101-120.
- Juster, F. T., Ono, H., & Stafford, F. P. (2004). *Changing times of American youth: 1981-2003*. Ann Arbor, MI: Institute for Social Research, Univ. of Michigan.
- Karsten, L. (2005). It all used to be better? Different geographies on continuity and change in urban children's daily use of space. *Children's Geographies*, 3(3), 275-290. doi:10.1080/14733280500352912

- Kellert, S. R. (2002). Experiencing nature: Affective, cognitive, and evaluative development in children. In P. H. Kahn & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural, and evolutionary investigations* (pp. 117-151). Cambridge, MA: The MIT Press.
- Kellert, S. R. (2005). Nature and childhood development. In S. R. Kellert (Ed.), *Building for life: Designing and understanding the human-nature connection* (pp. 63-89). Washington, DC: Island Press.
- Kimbell, A. R., Schuhmann, A., & Brown, H. (2009). More kids in the woods: Reconnecting Americans with nature. *Journal of Forestry*, 107(7), 373-377.
- Larson, L. R., Castleberry, S. B., & Green, G. T. (2010). Effects of an environmental education program on the environmental orientations of children from different gender, age, and ethnic groups. *Journal of Park and Recreation Administration*, 28(3), 95-113.
- Larson, L. R., Green, G. T., & Castleberry, S. B. (2010). I'm too old to go outside! Examining age-related differences in children's environmental orientations. In C. W. Watts & C. L. Fisher (Eds.), *Proceedings of the 2009 Northeastern Recreation Research Symposium (GRT-NRS-P-66)*. Newton Square, PA: USDA Forest Service, Northern Research Station.
- Larson, L. R., Whiting, J. W., & Green, G. T. (2011). Exploring the influence of outdoor recreation participation on pro-environmental behaviour in a demographically-diverse population. *Local Environment*, 16(1), 67-86. doi:10.1080/13549839.2010.548373
- Larson, R. W., & Verma, S. (1999). How children and adolescents spend time across the world: Work, play, and developmental opportunities. *Psychological Bulletin*, 125(6), 701-736. doi:10.1037/0033-2909.125.6.701
- Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Lynn, A. (2010). Playground equipment goes techie: Electronic playgrounds lure kids outside. *Parks and Recreation*, 45(12), 61-63
- Maller, C., Townsend, M., Pryor, A., Brown, P., & St. Leger, L. (2006). Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promotion International*, 21(1), 45-54. doi: 10.1093/heapro/dai032
- Outdoor Foundation. (2008). *Outdoor Recreation Participation Report 2008*. Boulder, CO: The Outdoor Foundation. Retrieved December 14, 2010, from Outdoor Foundation: <http://www.outdoorfoundation.org/pdf/ResearchParticipation2008.pdf>
- Outdoor Foundation. (2009). *Outdoor Recreation Participation Report 2009*. Boulder, CO: Outdoor Foundation. Retrieved December 14, 2010, from Outdoor Foundation: <http://www.outdoorfoundation.org/research.participation.2009.html>
- Outdoor Foundation. (2010). *Outdoor Recreation Participation Report 2010*. Boulder, CO: Outdoor Foundation. Retrieved December 14, 2010, from Outdoor Foundation: <http://www.outdoorfoundation.org/research.participation.2010.html>
- Pergams, O. R. W., & Zaradic, P. A. (2008). Evidence for a fundamental and pervasive shift away from nature-based recreation. *Proceedings of the National Academy of Sciences of the United States of America*, 105(7), 2295-2300. doi:10.1073/pnas.0709893105
- Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). *Generation M2: Media in the lives of 8- to 18-Year-Olds*. Menlo Park, CA: Kaiser Family Foundation.
- Roemmich, J. N., Epstein, L. H., Raja, S., Yin, L., Robinson, J., & Winiewicz, D. (2006). Association of access to parks and recreational facilities with the physical activity of young children. *Preventive Medicine*, 43(6), 437-441. doi:10.1016/j.ypmed.2006.07.007
- Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise*, 32(5), 963-975.
- Sherer, P. M. (2006). *The benefits of parks: Why America needs more city parks and open space*. San Francisco, CA: The Trust for Public Land.
- Shinew, K. J., Floyd, M. F., & Parry, D. (2004). Understanding the relationship between race and leisure activities and constraints: Exploring an alternative framework. *Leisure Sciences*, 26, 181-199. doi:10.1080/01490400490432109
- Shinew, K. J., Stodolska, M., Floyd, M., Hibbler, D., Allison, M., & Johnson, C. (2006). Race and ethnicity in leisure behavior: Where have we been and where do we need to go? *Leisure Sciences*, 28(4), 403-408. doi:10.1080/01490400600745902

- Skar, M., & Krogh, E. (2009). Changes in children's nature-based experiences near home: from spontaneous play to adult-controlled, planned and organised activities. *Children's Geographies*, 7(3), 339-354. doi:10.1080/14733280903024506
- SPSS. (2008). SPSS Version 18.0 for Windows. Chicago, IL: SPSS, Inc.
- Taylor, A. F., & Kuo, F. E. (2006). Is contact with nature important for healthy child development? State of the evidence. In C. Spencer & M. Blades (Eds.), *Children and their environments: Learning, using and designing spaces* (pp. 124-140). Cambridge, UK: Cambridge University Press.
- Taylor, A. F., Kuo, F. E., & Sullivan, W. C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment and Behavior*, 33(1), 54-77. doi:10.1177/00139160121972864
- Taylor, A. F., & Kuo, F. E. (2009). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders*, 12(5), 402-409. doi:10.1177/1087054708323000
- Thompson, C. W., Aspinall, P., & Montarzino, A. (2008). The childhood factor—adult visits to green places and the significance of childhood experience. *Environment and Behavior*, 40(1), 111-143. doi:10.1177/0013916507300119
- Timperio, A., Crawford, D., Telford, A., & Salmon, J. (2004). Perceptions about the local neighborhood and walking and cycling among children. *Preventive Medicine*, 38(1). doi:10.1016/j.ypmed.2003.09.026
- United States Fish and Wildlife Service. (USFWS). (2006). *2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation*. Washington, DC: U.S. Dept. of the Interior, Fish & Wildlife Service, U.S. Dept. of Commerce, U.S. Census Bureau. Retrieved May 2, 2011, from U.S.F.W.S: http://library.fws.gov/pubs/nat_survey2006_final.pdf
- United States Census Bureau. (2000). *Census 2000 Profiles of General Demographic Packages*. Washington, DC: U. S. Census Bureau, Population Division. Retrieved May 1, 2011, from U.S. Census Bureau: http://www.census.gov/mp/www/cat/decennial_census_2000/census_2000_profiles_of_general_demographic_characteristics_state_packages.html
- United States Census Bureau. (2007). *U. S. Census Bureau Population Estimates*. Washington, DC: U. S. Census Bureau, Population Division. Retrieved December 12, 2010, from U.S. Census Bureau: http://www.census.gov/popest/archives/2000s/vintage_2007/
- Vandewater, E. A., Rideout, V. J., Wartella, E. A., Huang, X., Lee, J. H., & Shim, M. S. (2007). Digital childhood: Electronic media and technology use among infants, toddlers, and preschoolers. *Pediatrics*, 119(5), E1006-E1015. doi:10.1542/peds.2006-1804
- Veitch, J., Bagley, S., Ball, K., & Salmon, J. (2006). Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & Place*, 12(4), 383-393. doi:10.1016/j.healthplace.2005.02.009
- Weir, L. A., Etelson, D., & Brand, D. A. (2006). Parents' perceptions of neighborhood safety and children's physical activity. *Preventive Medicine*, 43(3), 212-217. doi:10.1016/j.ypmed.2006.03.024
- Wells, N. M., & Lekies, K. S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth and Environments*, 16(1), 1-24.
- Wridt, P. J. (2004). An historical analysis of young people's use of public space, parks, and playgrounds in New York City. *Children, Youth and Environments*, 14(1), 86-106.
- Zaradic, P. A., & Pergams, O. R. W. (2007). Videophilia: Implications for childhood development and conservation. *Journal of Developmental Processes*, 2, 130-144.