

Parental Perception of Neighborhood Safety and Children's Physical Activity

Karla I. Galaviz, Deena Zytneck, Michelle C. Kegler, and Solveig A. Cunningham

Background: We examined the relationship between parents' perception of neighborhood safety and children's physical activity and use of recreation facilities in a US nationally representative sample of fifth grade children. **Methods:** We used data from the Early Childhood Longitudinal Study Kindergarten cohort, fifth grade sample ($N = 9827$). Multivariate logistic and linear regression models were used to examine associations between parents' perception of neighborhood safety for outside play and number of days children engage in physical activity, as well as children's use of recreational facilities for physical activity. **Results:** Children who used recreational facilities engaged in physical activity on more days of the week compared with children who did not use a facility (3.3 days vs. 3.8 days, $P < .0001$). Children from neighborhoods perceived as unsafe by parents engaged in almost 1 less day per week in physical activity ($\beta = -.89$, $P < .0001$). Children from neighborhoods perceived as unsafe were less likely to use recreational facilities compared with children from neighborhoods perceived as safe (odds ratio = 0.72, $P < .0001$). Children from less affluent families across rural and urban areas had half the odds of using recreational facilities compared with children from the wealthiest families living in urban areas. **Conclusions:** Parents' perception of neighborhood safety for outside play can deter or promote children's physical activity and use of recreational facilities. Children from less affluent families are less likely to use facilities than children from wealthy families, regardless of place of residence.

Keywords: exercise, recreational facilities, safety

Regular physical activity in childhood can benefit children's health and well-being.¹⁻³ Physical activity protects children against obesity, metabolic syndrome, cardiovascular diseases, and mental health problems.¹⁻⁴ Children 6 to 17 years old should engage in 60 minutes or more of moderate-to-vigorous aerobic physical activity each day, which should include muscle and bone strengthening activities, such as gymnastics or push-ups, 3 times per week.⁵ Still, nationally representative data from 2009 to 2010 show that only 30% of 6- to 11-year-old children in the United States met these guidelines.⁶ Since physical activity levels tend to decline as children grow,⁷ those with low activity levels face higher risks for inactivity-related health risks later in life.⁸

Time spent outdoors is a strong correlate of children's physical activity.^{9,10} Outdoor active play represents a unique opportunity for children to engage in health-enhancing physical activity.^{11,12} Supportive environments are also important, namely recreational facilities and spaces (eg, parks, playgrounds, and community centers) where children can be physically active, and have been shown to promote daily engagement in physical activity.^{10,13-18} However, parents' perceptions of neighborhood safety can affect how much they encourage and support children's outdoor active time.¹⁹⁻²¹ Parents are less likely to encourage their children toward outdoor activities if they feel their neighborhood is unsafe due to dangers from strangers or road traffic.^{20,22-24} If they are concerned about safety, parents set physical activity time limits, restrict the distance

their children go, and only allow activities done in a group or under adult supervision.^{25,26} Parents' perception of neighborhood safety is one of the factors determining whether children and youth meet physical activity recommendations.²⁷

Over the last decade, children's active play has become more structured, supervised, and increasingly performed indoors,^{12,28,29} in part due to parents' safety concerns.¹³ Nationally representative studies and systematic reviews have examined relationships between parents' perceptions of neighborhood safety and children's physical activity^{9,20,21,27}; links between perceived safety, recreation facility use, and activity levels are less understood. One qualitative study showed that parents restrict children's physical activity regardless of the availability of recreational facilities in the neighborhood,³⁰ whereas a European study found that perceptions of neighborhood safety can influence adults' readiness to encourage children to use playgrounds.¹⁹ The implications may be particularly large for children in lower-income neighborhoods, because recreational facilities are generally less common and of poorer quality in low- than in high-income areas.^{31,32} The goal of this study is to examine the associations between parents' perception of neighborhood safety, children's use of recreation facilities, and physical activity in a nationally representative sample of children in the fifth grade.

Methods

Participants

We conducted a secondary data analysis using the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K). Multistage probability sampling was used to select a nationally representative cohort of 21,387 children in kindergarten in 1998.^{33,34} Data were collected via computer-assisted telephone or in-person interviews with primary caregivers, who were most often mothers,

Galaviz and Cunningham are with the Emory Global Diabetes Research Center, Hubert Department of Global Health, Emory University, Atlanta, GA. Zytneck is with the Dept of Public Health and Community Medicine, Tufts University, Boston, MA. Kegler is with the Dept of Behavioral Sciences and Health Education, Emory University, Atlanta, GA. Zytneck (deena.zytneck@tufts.edu) is corresponding author.

grandparents, or fathers of the sampled children.^{34,35} We used data collected on the cohort in the spring of their fifth grade year, when they were 10 to 12 years old, and 11,820 children remained in the study.³⁶ Our analytic sample consisted of 9827 children after list-wise deletion of observation with missing data on key variables.

Measures

The outcome variables for this analysis pertain to children's physical activity and use of recreational facilities. Parents were asked to report how many days in a typical week the child got physical activity that caused rapid breathing, perspiration, and a rapid heartbeat for 20 continuous minutes or more. Possible responses ranged from 0 to 7 days in the week. Parents also reported if the child regularly engaged in physical activities in the last 12 months through an organization such as a public park or recreation center, church or other place of worship, sports team or league, health club or private spa, YMCA/YWCA, club scouts, or farm clubs. For analyses, we categorized children as facility users if they used at least 1 of the listed facilities and as nonusers if they did not use any facility.

The main exposure was parents' perception of neighborhood safety, which was measured by asking parents how safe it is for children to play outside during the day in their neighborhood. Response categories were not at all safe, somewhat safe, and very safe.

Variables that may influence physical activity were controlled for in multivariate analyses: children's age in years, gender, race (white, Black, Asian, Hispanic, other), family socioeconomic status (SES) quintile (ECLS-K composite variable created from household income and parents' education and occupation with categories ranging from quintile 1 [lowest] to quintile 5 [highest]), how the child prefers to spend his/her free time (in sedentary activities or in physical activities or both), and school location (large/medium city, suburb/large town, small town/rural).

Data Analysis

Survey adjustments were used as appropriate for the fifth grade ECLS-K data.³³ χ^2 tests were used to explore the distribution of children characteristics across categories of perceived safety and *t* tests were employed to compare physical activity levels between girls and boys and between recreational facility users and nonusers. Multivariate logistic regression models were used to assess associations between parents' perception of neighborhood safety and recreational facility use. Multivariate linear regression models were used to examine associations between parents' perception and children physical activity. In both regression models, we tested the effect of the interaction between SES and school location on children physical activity and facility use. Analyses were performed using the Statistical Package for Social Sciences (version 23; IBM Corporation, Irvine, CA).

Results

The children included in this analysis had a mean age of 11 years, 51.1% were female, 57.0% were non-Hispanic white, and 41.8% lived in large and mid-size suburban areas or large towns (Table 1). Most children (81.6%) used at least 1 recreational facility in the previous 12 months for physical activity and engaged in physical activity on average 4 days per week. Boys engaged in physical activities on more days of the week than girls (3.4 days vs. 4.0 days, $P < .05$). Children who used at least 1 recreational facility during the

Table 1 Children Characteristics, Demographic Characteristics, and Descriptive Statistics of Analyzed Variables (N = 9827)

Variables ^a	Percentage or mean (SE)
Children characteristics	
Age in years	11.1 (0.00)
Male	48.9% (0.92)
Female	51.1% (0.92)
White, non-Hispanic	57.0% (1.84)
Black, non-Hispanic	16.4% (1.18)
Hispanic	19.4% (1.40)
Asian	2.8% (0.24)
Other ^b	4.5% (1.02)
Family SES ^c	
Quintile 1 (lowest)	20.6% (0.96)
Quintile 2	20.6% (0.74)
Quintile 3	20.1% (0.82)
Quintile 4	19.3% (0.74)
Quintile 5 (highest)	19.4% (0.91)
Location type	
Large and midsize city	35.4% (1.53)
Large and midsize suburb and large town	41.8% (2.58)
Small town and rural	22.9% (2.37)
Parental perception of neighborhood safety	
Not at all safe	2.5% (0.30)
Somewhat safe	24.3% (0.98)
Very safe	73.2% (1.08)
Children's activity preferences	
Sedentary activities	17.5% (0.68)
Physical activities	22.9% (0.73)
Both	59.6% (0.83)
Regular use of recreational facilities	
Yes	81.6% (0.74)
No	18.4% (0.74)
Physical activity days in a week	3.7 (0.04) ^d

Abbreviations: ECLS-K, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999; SES, socioeconomic status.

^a From ECLS-K 5th grade data collection, round 6 child assessment and parent interview, based on survey-adjusted data.

^b Other race includes Native Hawaiian or Pacific Islander, American Indian, Alaska native, or multiracial.

^c ECLS-K composite variable created from household income and parents' education and occupation.

^d Mean days per week in which children engage in 20 or more continuous minutes of physical activity.

previous 12 months engaged in physical activities on more days of the week than children who did not use a facility (3.3 days vs. 3.8 days, $P < .05$). Approximately 60% of children were from families in the poorest SES quintiles (quintiles 1 to 3), and 40% from families

in the wealthiest quintiles (quintiles 4 to 5). The majority of parents perceived their neighborhood to be very safe for children to play outside during the day (73.2%).

More parents of white children (85.2%) perceived their neighborhood as very safe for children to play outside during the day than parents of children from other races (53.7% to 72.7%, $P < .0001$). Similarly, more parents in the highest SES quintile (90.0%) and living in small towns/rural areas (83.8%) perceived their neighborhood as very safe than parents in lower SES quintiles (51.3% to 83.6%, $P < .0001$) and those from urban areas (61.3% to 77.4%, $P < .0001$). More children whose parents perceived their neighborhood as very safe used recreational facilities (75.0%) than children whose parents perceived their neighborhood as somewhat safe (22.9%) and not at all safe (2.1%, $P < .0001$). Likewise, children whose parents perceived their neighborhood as very safe engaged in physical activity on more days of the week (3.9 days) than children whose

parents perceived their neighborhood as somewhat safe (3.4 days) or not at all safe (2.9 days, $P < .0001$; Table 2).

In model 1 of Table 3, we show patterns of recreational facility use, based on a multivariate logistic regression. Children from neighborhoods perceived as unsafe were less likely to use recreational facilities compared with children from neighborhoods perceived as very safe (odds ratio [OR] = 0.72). Similarly, children from neighborhoods perceived as somewhat safe were less likely to use recreational facilities compared with children from neighborhoods perceived as very safe (OR = 0.94).

In model 2 of Table 3, we show results of a multivariate linear regression model exploring children's physical activity. Compared with children whose parents perceived their neighborhood as very safe, children whose parents perceived their neighborhood as unsafe engaged in almost 1 less day (0.89) per week in physical activity. Children whose parents reported that their neighborhood

Table 2 Associations Among Demographic Variables, Children Physical Activity, and Facility Use With Parental Safety Perception (N = 9827)^a

Characteristics	Parental Perception of Neighborhood Safety			
	Not at all safe	Somewhat safe	Very safe	P value
Child race (%)				
White, non-Hispanic	1.1	13.8	85.2	<.0001
Black, non-Hispanic	3.0	43.3	53.7	
Hispanic	5.9	38.2	55.9	
Asian	4.4	22.9	72.7	
Other ^b	3.2	29.6	67.3	
Family SES ^c (%)				
Quintile 1 (lowest)	5.6	43.1	51.3	<.0001
Quintile 2	2.7	30.3	67.0	
Quintile 3	3.0	21.5	75.5	
Quintile 4	0.7	15.6	83.6	
Quintile 5 (highest)	0.2	9.7	90.0	
Location type (%)				
Large and midsize city	4.0	34.7	61.3	<.0001
Large and midsize suburb/town	1.8	20.8	77.4	
Small town and rural	1.3	14.9	83.8	
Child activity preferences (%)				
Sedentary activities	2.3	29.5	68.2	<.0001
Physical activities	3.1	19.4	77.5	
Both	2.3	24.7	72.9	
Regular use of recreational facilities (%)				
Yes	2.1	22.9	75.0	<.0001
No	4.0	30.7	65.2	
Physical activity days in a week (mean)	2.9 ^d	3.4 ^d	3.9 ^d	<.000 ^e

Abbreviations: ECLS-K, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999; SES, socioeconomic status.

^a From ECLS-K 5th grade data collection, round 6 child assessment and parent interview, based on survey-adjusted data.

^b Other race includes Native Hawaiian or Pacific Islander, American Indian, Alaska native, or multiracial.

^c ECLS-K composite variable created from household income and parents' education and occupation.

^d Mean days per week in which children engage in 20 or more continuous minutes of physical activity.

^e Analysis of variance P value.

Table 3 Logistic and Linear Regression Multivariate Models Exploring Associations Between Parent Perceptions of Neighborhood Safety and regular Use of Recreational Facilities or Number of Days of Physical Activity (N = 9827)^a

Variables	Model 1	Model 2
	Facility use ^b (OR [95% CI])	Physical activity days (β [SE])
Parental perception of neighborhood safety		
Not at all safe	0.72 [0.71–0.73]**	–0.89 [0.01]**
Somewhat safe	0.94 [0.93–0.95]**	–0.34 [0.00]**
Very safe (ref)	1.0	1.0
Child age in years	1.06 [1.05–1.06]**	–0.04 [0.00]**
Child gender		
Female (ref)	1.0	1.0
Male	1.34 [1.33–1.34]**	0.58 [0.00]**
Child race		
White, non-Hispanic (ref)	1.0	1.0
Black, non-Hispanic	0.65 [0.64–0.65]**	0.16 [0.01]**
Hispanic	0.52 [0.51–0.52]**	0.08 [0.00]**
Asian	0.44 [0.43–0.45]**	–0.21 [0.01]**
Other ^c	1.08 [1.06–1.09]**	0.30 [0.01]**
Child activity preferences		
Sedentary activities	0.62 [0.62–0.63]**	–0.86 [0.00]**
Physically active activities	1.19 [1.18–1.20]**	0.51 [0.00]**
Both (ref)	1.0	1.0
Family SES ^d by location ^e		
Poorest 60% in small town or rural area	0.48 [0.48–0.49]**	0.05 [0.00]**
Poorest 60% in urban area	0.51 [0.51–0.52]**	–0.16 [0.00]**
Wealthiest 40% in small town or rural area	1.59 [1.56–1.62]**	–0.02 [0.00]**
Wealthiest 40% in urban area (ref)	1.0	1.0

Abbreviations: CI, confidence interval; ECLS-K, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999; OR, odds ratio; ref, reference; SES, socioeconomic status.

^a From ECLS-K 5th grade data collection, round 6 parent interview, based on survey-adjusted data.

^b Recreational facility could be a public park, recreation center, a church or other place of worship, a sports team or league not affiliated with churches, YMCA, health club or private spa, Cub scouts, Brownies, or other scouts, 4-H or other farm clubs.

^c Other race includes Native Hawaiian or Pacific Islander, American Indian, Alaska native, or multiracial.

^d ECLS-K composite variable created from household income and parents’ education and occupation. Lower quintiles category includes quintiles 1–3. Upper quintiles category includes quintiles 4–5.

^e Large/medium size city and large town/suburb categories were collapsed to form the urban category and to compare it against the small town/rural category.

***P* < .0001.

was somewhat safe engaged in 0.34 fewer days of physical activity per week. This translates to ~52 more days per year of physical activity for children in neighborhoods perceived as safe and ~15 more days for those in neighborhoods perceived as somewhat safe compared with children from neighborhoods perceived as unsafe for outside play.

Because we found a significant interaction effect of SES by location type (*P* < .0001), we examined whether poorer children in rural and urban areas had different patterns of physical activity and use of recreational facilities than wealthier children from rural and urban areas. We found that children from the 60% poorest families (SES quintiles 1 to 3) in urban and rural areas were about half as

likely to use recreational facilities than children in urban areas from the wealthiest 40% of families (SES quintiles 4 to 5). Conversely, children from the 40% wealthiest families in small towns or rural areas were 60% more likely to use recreational facilities than children in the wealthiest quintiles in urban areas. Regarding physical activity, children from the 60% poorest families in small towns and rural areas engaged in 0.05 more days of physical activity per week than children in the wealthiest 40% of families in urban areas. Children from the 60% poorest families in urban areas and those from the 40% wealthiest families in rural areas engaged in 0.16 and 0.02 less days of physical activity, respectively, than children from the wealthiest 40% of families in urban areas (Table 3).

Discussion

This study examined the associations between parents' perception of neighborhood safety and children's physical activity and recreational facility use in a nationally representative cohort of fifth graders. We found that children who lived in neighborhoods perceived as very safe by their parents engaged in almost 1 more day of physical activity per week than children who lived in neighborhoods parents perceived as unsafe. Likewise, children who used recreational facilities engaged in physical activity on more days per week than those who do not. The likelihood of children using recreational facilities was lower in neighborhoods perceived as unsafe and lower among children from less affluent families, regardless of place of residence. Our findings suggest that children whose parents perceive their neighborhood to be safe were more physically active and more likely to use recreational facilities, than children from neighborhoods perceived as unsafe.

Our results align with previous findings^{20,21} showing that parents' safety concerns deter children's physical activity and strengthen the evidence by employing data from a large, nationally representative sample of children. Major reasons for parental anxiety around safety include stranger danger and car traffic.^{20,22–24} These concerns drive parents to set time limits on outdoor activities, restrict the distance their children can go, and prefer activities done in group or under adult supervision.^{25,26} However, outdoor play is safer than parents believe; the US Department of Justice reported in 2002 that very few children nationally were victims of a kidnapping involving a stranger.³⁷ Thus, addressing parents' safety concerns may be an important step for enhancing physical activity opportunities for children.

Children from neighborhoods perceived as unsafe were less likely to use recreational facilities compared with children from neighborhoods perceived as safe. Because our recreational facilities measure included public parks and recreation centers, our findings suggest that unsafe neighborhoods may be acting as a barrier between children and outdoor recreational facility use. However, since our recreational facility measure also included other facilities (eg, church, sports leagues, health clubs) that may or may not have been in the neighborhood, socioeconomic factors may also explain our recreational facility use findings. For instance, we found that children from less affluent families were less likely to use facilities than children from wealthy families, regardless of place of residence, whereas children from affluent families in rural areas had the highest facility use odds. Disparities in availability of recreational facilities between low- and high-income neighborhoods have been documented before,^{31,32} so it is possible that children from poorer families may have less access to recreational facilities. Thus, economic disparities, in addition to parental safety perceptions, are strong factors driving children's facility use.

The present findings should be interpreted in light of our study limitations. Specifically, this study provides evidence of associations and not causality, and associations between parental safety perceptions and children physical activity and facility use should be interpreted accordingly. Children's physical activity was measured by parent report, which may be prone to overestimation due to social desirability. Further, because our neighborhood safety measure focused on children in general, we cannot ascertain whether parents responded with their children or other children in mind. Likewise, we cannot ascertain what specific safety concerns parents had (eg, stranger danger or road/traffic safety), or what were safety concerns at specific types of recreational places (eg, park, facilities, or backyard). Finally, parents were not asked whether the recreational

facilities used were in their neighborhood, so findings refer to recreational facilities not necessarily specific to the neighborhood.

Although measures of the social environment at the neighborhood level were not included (eg, collective safety or sense of community), parental safety perceptions could account for these. Indeed, unlike objective measures, parental safety perception measures allow parents to determine what is relevant to their children in their neighborhood and to simultaneously account for various aspects of the physical and social environment.²¹ This may explain why objective safety measures may not always align with perception measures^{38,39} and highlights the influence parental perceptions can have on children physical activity and recreational facility use. The main strength of this study is the large, nationally representative sample of fifth graders included in this study, which provided sufficient statistical power to explore meaningful associations that can be generalizable to fifth graders in the United States.

Conclusions

Outdoor active play and recreational facilities represent important opportunities for children to engage in health-enhancing physical activity. We found that children whose parents perceived their neighborhood to be safe engaged in more days of physical activity and were more likely to use recreational facilities than children from neighborhoods perceived as unsafe. Parental perceptions of neighborhood safety thus influence children's physical activity and should be considered in strategies to improve physical activity opportunities for children. Addressing parents' safety concerns and improving neighborhood safety features, such as lighting, represent potential strategies to improve opportunities for physical activity among children. Active play is essential for children's mental, physical, and social development and opportunities to engage in physical activities should exist in multiple settings including their home, school, and neighborhood environments.

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