

RESEARCH ARTICLE

Physical and Social Contexts of Physical Activity Behaviors of Fifth and Seventh Grade Youth*

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ABSTRACT

BACKGROUND: The purpose of this study was to characterize the temporal, social, and physical contexts for physical activities commonly reported in a diverse cohort of 753 boys and girls from fifth to seventh grade.

METHODS: Data were obtained from a multilevel longitudinal study, the Transitions and Activity Changes in Kids. The Physical Activity Choices instrument assessed previous 5-day participation in specific physical activities and their temporal, social, and physical contexts. Mixed model repeated measure analyses of variance and multinomial analyses examined sex differences and change over time.

RESULTS: Fifth grade boys and girls reported participation in similar activities at similar frequencies, which declined significantly by seventh grade. One temporal pattern, playing with younger children, changed over time from “both inside/outside” to “outside” school. Boys and females reported more activities performed in class/team groups over time. Most activities took place primarily at home for all participants in both grades.

CONCLUSIONS: Boys and girls reported declines in the variety and frequency of activities from fifth to seventh grade. There were sex-specific patterns in physical activities and groups; however, all participants reported home as the primary location and a shift to class/team groups over time. Schools are well-positioned to provide additional physical activity opportunities.

Keywords: physical fitness and sport; child and adolescent health; public health.

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Physical activity levels decline from childhood through adolescence and adulthood, with declines greater in girls than boys.¹⁻⁴ These declines increase health risks for children, adolescents, and young adults, because participation in physical activity provides numerous health benefits.^{5,6} Furthermore, in recent decades physical activity levels have declined in adolescent populations.^{7,8} These developmental declines in physical activity, coupled with the

population reductions in physical activity over recent decades, create cause for concern, given the public health benefits of physical activity throughout the lifespan.

Declines in physical activity during childhood and adolescence are associated with maturational processes, as well as with more proximal psychological and social factors.² The importance of the social context for engaging in physical activity, with

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whom one is physically active, is supported by the environmental component of social cognitive theory.⁹ Close contacts, such as friends, peers, and family, influence physical activity participation through social persuasion, modeling and imitation, and social comparison,¹⁰ as well as through conveying social support, norms, acceptance or victimization, and crowd affiliation.^{11,12}

Empirical evidence also supports the important role of social context in physical activity participation. Children are more active with peers than when alone.¹¹⁻¹⁵ A recent review indicated that encouragement, physical activity among friends, and participation in physical activity with friends are associated with higher levels of physical activity in children.¹⁶ The social environment may be especially important for children and adolescents.^{16,17} Therefore, understanding with whom children and adolescents are active, and how this changes over time, is fundamental to understanding social environmental influences on physical activity, especially during developmental transitions.

The physical environment also influences physical activity in youth, especially having access to places for play.¹⁸⁻²⁰ Reported common locations for physical activity in children vary greatly, which may reflect differing study methodologies and variations in local opportunities and resources. For example, one research team reported that one children are physically active primarily outdoors away from home, followed by indoors at home, with other locations such as a gym or recreation facility being less common.²¹ Another found that home/neighborhood and school were the most common locations,²² whereas a third study found that indoor and outdoor community facilities and parks were the most common locations for physical activity.²³

The social environment may exert more influence on youth physical activity than the physical environment.^{23,24} However, the physical and social environments are also inextricably linked,²⁵ which suggests that a full understanding of the contexts in which youth engage in physical activity requires an understanding of both the people with whom youth are active and the places where they are active.

Few studies have simultaneously examined the physical and social contexts of youth physical activity, especially as they relate to sex differences,^{13,21,22,24,25} and fewer have examined contextual factors during developmental transitions.^{26,27} Researchers and practitioners need to understand age- and sex-specific contextual patterns of engaging in physical activity in order to design effective programs and policies to promote physical activity in youth.^{16,22,24} Therefore, the purpose of this study was to characterize the physical and social contexts for the physical activities reported most commonly in a diverse community cohort of boys and girls in grades 5 through 7.

METHODS

Participants

Data were obtained from an ongoing multi-level longitudinal study, the Transitions and Activity Changes in Kids Study (TRACK), which examined the influences on changes in children's physical activity as they transitioned from elementary to middle school. The study presented here analyzed data on the cohort of students with both fifth and seventh grade data to examine physical activities commonly reported and to describe/compare the temporal, social, and physical contexts of specific physical activities for boys and girls.

The fifth to seventh grade cohort included 753 participants. The mean age of the participants in grade 5 was 10.5 (SD = 0.55) years, and in grade 7 the mean age was 12.5 (SD = 0.53) years. Slightly over half (54.7%) were female. The racial/ethnic composition of the cohort was 38.9%, 35.2%, 10.2%, and 15.8% black, white, Hispanic, and other, respectively. Slightly more than half of the parents (56.3%) had more than a high school education.

Instruments

Physical activity behavior and temporal, physical, and social contexts. The Physical Activity Choices (PAC) instrument was used to assess participation in specific types of physical activities, whether the activities took place during and/or outside school (ie, temporal context), with whom these activities were done (ie, social context), and locations where the activities took place. As previously reported^{28,29} the PAC was adapted from the Three Day Physical Activity Recall (3DPAR) instrument.³⁰ Unlike the 3DPAR, which required participants to report engagement in physical activity during specific time blocks, the PAC asked participants to report any participation in a given activity during the past 5 days (eg, "Between [5 days ago] and today did you do the following activity . . ."). There were 49 possible activities in fifth grade and 52 in seventh grade; hunting, fishing, and rock/wall climbing were added in the seventh-grade assessment.

For each activity in which a child participated during the past 5 days, he/she was asked to identify: (1) the broad temporal context, in which the single most common context was selected from: during school, outside of school, or both; (2) the primary social context, in which the single most common social context was selected from: alone, with one other person, with several other people, or as part of a team or class; and (3) the primary locations, in which multiple locations were indicated from: school, recreation center, park, gym, church, neighborhood, and/or home. If the participant did the activity only during school, the questions stopped, with the assumption that the social context was class/team and location was school. If the participant answered outside

of school or both, the questions continued with the “where” and “with whom” items.

Sociodemographics. Participants self-reported their age, sex, and race/ethnicity. For race/ethnicity, participants were asked to identify with the following races (check all that apply): White, Black/African American, Asian, American Indian/Alaskan Native, and Other. They were also asked to self-identify as Hispanic or Latino. Race/ethnicity was recoded as Black, White, Hispanic, and other/mixed race. The highest level of parent education, reported by the parent, (high school or less OR more than high school) was used as a proxy for socioeconomic status.

Procedure

As previously reported,²⁸ children were recruited from 21 public elementary schools in 2 school districts in South Carolina. School district approval was obtained prior to approaching the schools. All 7 of the elementary schools in 1 district, Site A, and 14 of the 17 elementary schools in the other district, Site B, agreed to participate. Recruitment assemblies were held in all schools, during which students learned about the study and were invited to participate. Informed consent packets were sent home with the children in the fifth grade to obtain parental consent and child assent, prior to beginning the study procedures. Sixty-four percent and 57% of the students at Sites A and B were recruited, respectively. The demographics of the students recruited were representative of all students attending the schools in those districts.

Participants completed the Physical Activity Choices instrument using a computer-assisted, self-administered protocol, and were guided through a list of sedentary and physical activities; this paper focuses on the physical activities.

Data Analysis

Frequencies were run to assess the prevalence of each physical activity behavior reported in the previous 5 days, for the cohort of boys and girls in the fifth and seventh grades. Mixed model repeated measure analyses of variance (ANOVAs) were used to determine sex and grade differences in the prevalence of the most common activities, reported by at least one third of sample, in boys and girls in the fifth to seventh grade cohort, adjusting for race/ethnicity and parent education. Frequencies were used to examine the temporal, social, and physical contexts in which common physical activity behaviors took place for boys and girls separately. Temporal, social, and physical contexts were examined for physical activities common in the fifth grade and maintained through the seventh grade by at least 20% of the cohort, to ensure sufficient numbers for multiple contextual categories. In addition, changes in the patterns of

reported location and social context categories for physical activity were examined from fifth to seventh grade, separately for boys and girls. Patterns of changes from fifth to seventh grades for temporal and social contexts were examined using multinomial analyses controlling for school. Patterns of change in location over time were examined descriptively because respondents could select multiple locations.

RESULTS

Physical Activity Participation in Fifth and Seventh Grades

Table 1 shows 8 of the activities most commonly reported for the previous 5 days were the same for fifth grade boys and girls: calisthenics/exercise, basketball, playing with younger children, walking for exercise, running/jogging, playground games, playing catch, and bicycling. One activity, football, was unique to fifth grade boys; activities unique to fifth grade girls were dancing and jumping rope.

The percentage of boys and girls reporting previous 5-day participation in all activities decreased significantly by grade 7. One third or more of both boys and girls still reported participating in calisthenics and running/jogging. One third or more of boys also reported previous 5-day participation in football and basketball, whereas one third or more of girls reported playing with younger children and dancing. Across both grades, significantly more boys engaged in basketball, football, and playing catch than did girls, and girls reported higher frequencies for playing with younger children, dancing, jumping rope, and walking for exercise (Table 1).

Activities with high prevalence in grade 5 (with at least one third of sample reporting previous 5-day participation) and maintained by at least 20% of both boys and girls in grade 7 were calisthenics/exercise, running/jogging, basketball, and playing with younger children. Boys also maintained football and playing catch, and girls maintained dance and walking for exercise (Table 1).

Temporal Contexts for Physical Activity Participation in the Fifth to Seventh Grade Cohort

Table 2 depicts the temporal contexts (ie, during school, outside school, or both) for physical activities that were common for boys and girls in grade 5 and maintained through grade 7. In the fifth grade nearly half or more boys reported all activities as taking place “outside of school”; nearly half also reported calisthenics/exercise and running/jogging as taking place “both” during and outside school. Few boys reported activities that took place only during school at either grade level. Multinomial analysis for change over time revealed a significant change in the temporal pattern for playing with children, which took place

Table 1. Frequencies and Percentages of Commonly Reported Physical Activities During the Past 5 Days for Boys and Girls in Fifth to Seventh Grade Cohort

Physical Activities	Boys					
	Fifth Grade			Seventh Grade		
	N	Frequency	%	N	Frequency	%
<i>Calisthenics/exercise*</i>	332	212	63.9	275	109	39.6
<i>Running, jogging*</i>	333	193	58.0	275	86	31.3
<i>Basketball*†</i>	334	185	55.4	275	115	41.8
<i>Football*†</i>	332	171	51.5	275	102	37.1
Playground games: tetherball, four square*	333	148	44.4	275	31	11.3
Bicycling, mountain biking*	331	141	42.6	275	32	11.6
<i>Playing with younger children**</i>	329	127	38.6	275	62	22.6
<i>Playing catch*†</i>	328	127	38.7	275	63	22.9
<i>Walking for exercise**</i>	328	127	38.7	275	48	17.5

Physical Activities	Girls					
	Fifth Grade			Seventh Grade		
	N	Frequency	%	N	Frequency	%
<i>Calisthenics/exercise*</i>	399	273	68.4	335	140	41.8
<i>Playing with younger children**</i>	400	259	64.8	335	149	44.5
<i>Dancing, at home, in a class, in school*†</i>	401	252	62.8	335	136	40.6
<i>Running, jogging*</i>	401	238	59.4	334	116	34.6
<i>Walking for exercise**</i>	398	211	53.0	335	91	27.2
Playground games: tetherball, four square*	401	193	48.1	335	26	7.8
Jumping rope*†	398	176	44.2	323	32	9.9
Bicycling, mountain biking*	397	158	39.8	335	29	8.7
<i>Basketball*†</i>	398	143	35.9	335	71	21.2
<i>Playing catch*†</i>	402	132	32.8	335	58	17.3

Italicized activities have high prevalence ($\geq 33\%$) in fifth grade which was maintained at $\geq 20\%$ through seventh grade.

*Significant time main effect: decrease in frequency of previous 5-day participation.

†Significantly higher in boys.

**Significantly higher in girls.

“outside” school, versus “outside” and “both,” by most participants in grade 7.

As shown in Table 2, half or more fifth grade girls reported that activities took place “outside” school, except for calisthenics/exercise and running/jogging, which half or more reported as “both” inside and outside school. Few activities took place primarily “during” school in fifth grade. The pattern for 2 activities changed significantly from fifth to seventh grade; by grade 7 playing with children took place “outside” school only, versus “outside” and “both” inside and outside, by most participants, and calisthenics/exercise also took place “during” school in addition to “outside” and “both” inside and outside of school.

Social Contexts for Physical Activity Participation in the Fifth to Seventh Grade Cohort

Table 3 depicts the social contexts for physical activities that were common in fifth grade boys and girls and maintained through grade 7. Fifth grade boys participated in the 6 activities listed in a variety of social contexts, including alone, with one other, with several others, and with class/team. By grade 7, multinomial

analyses indicated a statistically significant shift in patterns for all activities, except for playing with younger children. Visual inspection indicates increased shifts toward participation in class/team contexts.

Fifth grade girls also reported activities in multiple social categories, including alone and with 1 or several others; however, few reported activities in a class/team context (Table 3). By grade 7, multinomial analyses revealed significant shifts in patterns for calisthenics/exercise and basketball; visual inspection of Table 3 indicates a shift to participation in class/team contexts. Thus, the primary social context pattern for boys and girls over time appears to shift to more activities performed in class/team contexts.

Physical Contexts

A striking finding evident upon visual inspection of Table 4 is that the primary location for all activities for grade 5 and 7 boys is the home. All activities except calisthenics/exercise also took place, to a lesser extent, in the neighborhood. Several activities also were reported to take place at the gym (ie, calisthenics/exercise), park (ie, football and playing

Table 2. Percent of Boys and Girls in the Fifth to Seventh Grade Cohort Reporting Temporal Contexts for Common Physical Activities During Past 5 Days

Physical Activities	Percentage of Boys Reporting During School, Outside School or Both								p*
	Fifth Grade				Seventh Grade				
	N	During	Outside	Both	N	During	Outside	Both	
Calisthenics/exercise	223	5.8	48.0	46.2	113	16.8	38.9	44.3	.25
Running, jogging	204	6.4	47.6	46.1	91	14.3	38.5	47.3	.71
Basketball	197	7.1	53.8	39.1	121	13.2	33.1	53.7	.10
Football	185	5.4	60.5	34.1	107	10.3	46.7	43.0	.26
Playing with younger children	134	6.0	67.2	26.9	66	1.5	86.4	12.1	.03
Playing catch	134	8.2	64.9	26.9	65	9.2	66.2	24.6	.50

Physical Activities	Percentage of Girls Reporting During School, Outside School or Both								p*
	Fifth Grade				Seventh Grade				
	N	During	Outside	Both	N	During	Outside	Both	
Calisthenics/exercise	289	10.0	40.1	49.8	143	25.9	35.0	39.2	.001
Running, jogging	249	4.8	42.2	52.6	119	16.8	33.6	49.6	.11
Basketball	153	6.5	54.3	39.2	71	19.7	39.4	40.9	.34
Playing with younger children	269	3.7	68.8	27.5	152	.7	89.5	9.9	<.001
Dancing (home, class, school)	265	4.5	58.5	36.6	139	6	64.8	31.7	.37
Walking for exercise	224	5.8	52.2	41.5	95	6.3	55.8	37.9	.45

Italicized areas indicate $\geq 20\%$ prevalence in sample.
 *p value for multinomial test for change over time.

Table 3. Percent of Boys and Girls in the Fifth to Seventh Grade Cohort Reporting Social Contexts for Common Physical Activities During Past 5 Days

Physical Activities	% of Boys Reporting "With Whom"										p*
	Fifth Grade					Seventh Grade					
	N	Alone	1 Other	Several	Class/Team	N	Alone	1 Other	Several	Class/Team	
Calisthenics/Exercise	208	48.6	22.1	16.8	11.5	94	40.4	19.2	13.8	26.6	.05
Running, jogging	187	31.0	31.0	30.5	7.5	78	28.2	23.1	21.8	26.9	.05
Basketball	181	10.5	22.1	47.0	20.4	105	5.7	12.4	47.6	34.	.05
Football	176	4.6	15.9	47.7	31.8	96	2.1	7.3	47.9	42.7	.02
Playing with younger children	124	20.2	29.8	47.6	2.4	65	16.9	29.2	50.8	3.1	.43
Playing catch	123	6.5	39.8	43.1	10.6	59	1.7	33.9	45.8	18.6	.03

Physical Activities	% of Girls Reporting "With Whom"										p*
	Fifth Grade					Seventh Grade					
	N	Alone	1 Other	Several	Class/Team	N	Alone	1 Other	Several	Class/Team	
Calisthenics/Exercise	251	29.5	33.8	22.1	13.6	105	21.0	21.0	20.0	38.1	.05
Running, jogging	235	20.4	37.5	35.3	6.8	99	20.0	32.3	26.3	21.2	.11
Basketball	142	11.3	29.6	44.4	14.8	57	0.0	17.5	61.4	21.1	.05
Playing with younger children	257	17.1	35.0	45.9	2.0	150	19.3	38.0	42.0	0.7	.28
Dancing (home, class, school)	246	26.4	20.7	41.5	11.4	133	24.1	14.3	46.6	15.0	.10
Walking for exercise	207	22.7	40.6	34.8	1.9	89	21.4	39.3	34.8	4.5	.67

Italicized areas indicate $\geq 20\%$ prevalence in sample.
 *p value for multinomial test for change over time.

catch), school and park (ie, running/jogging), and park and gym (ie, basketball). Few participants reported activities in recreation centers or churches. By grade 7, only 3 activities also took place outside the home and neighborhood: running/jogging at school, and basketball and football at the park.

As shown in Table 5, findings for girls are similar in that the home was the primary location for all activities in grades 5 and 7; all activities, except calisthenics/exercise and dancing, also took place in the neighborhood. In addition, in grade 5, all activities, except for playing with younger children, also took

Table 4. Frequency and Percent of Boys in Fifth to Seventh Grade Cohort Reporting Specific Locations for Common Physical Activities During the Past 5 Days

Physical Activities	N	Locations Fifth Grade						
		School	Rec	Park	Gym	Church	Neigh	Home
Calisthenics/exercise	212	41 (19.3)	17 (8.0)	34 (16.0)	63 (29.7)	2 (1.0)	25 (11.8)	127 (59.9)
Running, jogging	193	51 (26.4)	12 (6.2)	47 (24.4)	27 (14.0)	5 (2.6)	64 (33.0)	101 (52.3)
Basketball	185	31 (16.8)	14 (7.6)	53 (28.6)	55 (29.7)	9 (4.9)	45 (24.3)	94 (50.8)
Playing with younger children	127	17 (13.4)	9 (7.1)	21 (16.5)	6 (4.7)	5 (3.9)	28 (22.0)	81 (63.8)
Football	171	25 (14.6)	12 (7.0)	48 (28.1)	24 (14.0)	2 (1.2)	55 (32.2)	88 (51.5)
Playing catch	126	19 (15.1)	10 (7.9)	30 (23.8)	11 (8.7)	2 (1.6)	30 (23.8)	70 (55.6)

Physical Activities	N	Locations Seventh Grade						
		School	Rec	Park	Gym	Church	Neigh	Home
Calisthenics/exercise	109	1 (1.0)	10 (9.2)	11 (10.1)	16 (14.7)	1 (1.0)	7 (6.4)	78 (71.6)
Running, jogging	109	32 (29.4)	5 (5.0)	15 (13.8)	6 (5.5)	3 (2.8)	24 (22.0)	39 (35.8)
Basketball	86	5 (5.8)	11 (12.8)	21 (24.4)	26 (16.3)	14 (16.3)	29 (33.7)	63 (73.3)
Playing with younger children	62	7 (11.3)	5 (8.1)	6 (9.7)	0 (0)	4 (6.5)	17 (27.4)	48 (77.4)
Football	102	1 (1.0)	10 (9.8)	25 (24.5)	2 (2.0)	6 (5.9)	27 (26.5)	55 (53.9)
Playing catch	63	14 (22.2)	2 (3.2)	12 (19.0)	3 (4.8)	2 (3.2)	18 (28.6)	37 (58.7)

Neigh, neighborhood; Rec, recreation center.
 Italicized areas is ≥20% respondents reporting physical activity in this setting.

Table 5. Frequency and Percent of Girls in Fifth to Seventh Grade Cohort Reporting Specific Locations for Common Physical Activities During the Past 5 Days

Physical Activities	N	Locations Fifth Grade						
		School	Rec	Park	Gym	Church	Neigh	Home
Calisthenics/exercise	273	72 (26.4)	9 (3.3)	35 (12.8)	56 (20.5)	6 (2.2)	43 (15.8)	182 (66.7)
Running, jogging	238	89 (37.4)	18 (7.6)	60 (25.2)	28 (11.8)	11 (4.6)	96 (40.3)	128 (53.8)
Basketball	143	29 (20.3)	7 (4.9)	37 (25.9)	24 (16.8)	10 (7.0)	37 (25.9)	81 (56.6)
Playing with younger children	259	39 (15.1)	8 (3.1)	47 (18.1)	5 (1.9)	34 (13.1)	81 (31.1)	163 (62.9)
Dancing	252	52 (20.6)	16 (6.3)	25 (9.9)	17 (6.7)	22 (8.7)	48 (19.0)	171 (67.9)
Walking for exercise	211	54 (26.6)	10 (4.7)	45 (21.3)	18 (8.5)	10 (4.7)	83 (39.3)	115 (54.5)

Physical Activities	N	Locations Seventh Grade						
		School	Rec	Park	Gym	Church	Neigh	Home
Calisthenics/exercise	140	1 (1.0)	7 (5.0)	12 (8.6)	22 (15.7)	4 (2.9)	14 (10.0)	70 (50.0)
Running, jogging	116	43 (37.1)	2 (1.7)	17 (14.7)	15 (12.9)	3 (2.6)	36 (31.0)	59 (50.9)
Basketball	71	3 (4.2)	1 (1.4)	12 (16.9)	14 (19.7)	7 (9.9)	20 (24.7)	45 (63.4)
Playing with younger children	149	10 (6.7)	2 (1.3)	24 (16.1)	5 (3.4)	19 (12.8)	38 (25.5)	125 (83.9)
Dancing	136	2 (1.5)	5 (3.7)	11 (8.1)	8 (5.9)	14 (10.3)	19 (14.0)	96 (70.6)
Walking for exercise	91	0 (0)	2 (2.2)	15 (16.5)	11 (12.1)	3 (3.3)	40 (44.0)	50 (54.9)

Neigh, neighborhood; Rec, recreation center.
 Italicized areas is ≥20% respondents reporting physical activity in this setting.

place at school. In fifth grade, calisthenics also took place at the gym, and running, walking for exercise, and basketball also took place at the park. By grade 7, few activities took place outside of the home and neighborhood, although running was also reported at the school.

DISCUSSION

Physical Activity Participation in Fifth and Seventh Grades

Fifth grade boys and girls reported previous 5-day participation in many of the same physical activities at similar frequencies, including calisthenics/exercise,

running/jogging, playground games, and bicycling, and the frequency of participation in all activities for boys and girls declined from grades 5 to 7. More boys reported participation in basketball, football, and playing catch, whereas more girls reported playing with younger children, dance, walking for exercise, and jumping rope. Free play types of activities, such as playground games and bicycling for boys and girls and jumping rope for girls, were reported by few boys and girls in grade 7 compared to 5. Few boys reported walking for exercise in grade 7 whereas few girls reporting playing catch, revealing additional sex-related divergence in prevalent physical

activities over time. Participants reported little active transportation, which contrasts with other reports in the literature.^{22,26} This may be due, in part, to the largely rural nature of the home settings for many participants. Overall, these results are generally consistent with previously reported findings for common activities in which male and female children and adolescents engage.³¹⁻³⁴

The substantial decline in the number and variety of physical activities in both boys and girls from grades 5 to 7 is consistent with reports in the literature on the overall decline in physical activity,^{1-3,7,31} though few studies have documented declines in specific activities for boys and girls. Boys were more likely to engage in sport-skill activities, such as basketball, football, and playing catch, whereas girls were more likely to engage in noncompetitive leisure activities, such as playing with younger children, dance, and walking for exercise. This is consistent with findings on age and sex differences in the existing literature.^{31,32,34,35}

Temporal Contexts of Physical Activities

Descriptively, fifth and seventh grade boys and girls reported participating in activities “outside school” and “both” during and outside school. By grade 7 playing with younger children reflected a significant change in pattern over time for boys and girls, with an increase reported “outside” of school. This may reflect a decrease in the likelihood of interaction with younger children in middle compared to elementary school. Except for the significant shift in pattern for calisthenics/exercise for seventh grade girls, few fifth or seventh grade participants reported activities performed primarily during school. It appears that few physical activities take place solely at school, which emphasizes the importance of time outside of school for physical activity in youth.

Social Contexts of Physical Activities

Most boys and girls in fifth and seventh grade reported physical activity in social groups, with 1 or several others, for most activities, and some activities, such as running and calisthenics, were also performed alone. The primary social pattern for boys and girls over time was a shift to more activities performed in a class/team context. These results are consistent with the few studies that have examined change in social contexts for middle school youth over time²⁶ and are partially consistent with cross sectional studies with methodologies that differ from the present study.^{21,22} Dunton et al²¹ who did not examine sex differences, found that most activity takes place with multiple categories of people together, followed by alone, and friends only. Yan et al²² found that boys engaged in more recreational activity regardless of social context, whereas girls participated in more occupational or

home chore-related physical activity; they did not assess domain and social context separately.

Visual examination revealed that boys tended to participate in unstructured activities, such as calisthenics, running, and playing with younger children, alone and with 1 or more others. For activities requiring at least 2 people, such as playing catch, boys tended to do them primarily in social groups, and sports were done in social and class/team groups. By seventh grade, most activities shifted toward class/team groups. Fifth grade girls participate primarily in unstructured activities, except basketball; however, few participants reported activities in class/team groups. By grade 7, a significant shift in the pattern occurred in that calisthenics/exercise and basketball were also performed in social and class/team groups. Therefore, there appears to be a trend over time toward boys and girls participating in physical activities in group contexts which are likely more structured.

Physical Contexts of Physical Activities

Most participants in grades 5 and 7 reported that activities took place primarily at home and, to a lesser extent, in the neighborhood. Few boys reported the school as a common location for physical activity in grades 5 and 7 except for running. Boys reported using community locations, park and gym, in the grade 5 but only the park in grade 7. Few reported participating in activities in the church or recreation center. Fifth grade girls reported school settings for 5 activities, but by grade 7 only running was commonly reported in school settings. Girls reported using community locations less than boys reporting 2 activities in parks in fifth grade and none in seventh.

These results are consistent with those reported in a cross sectional study with home/neighborhood and school being the most common locations for physical activity.²² Our results are partially consistent with those of a longitudinal study conducted in a different region of the United States in which parent-reported home, school, and neighborhood were common physical activity locations; however, unlike the present study, children also commonly engaged in physical activity in indoor and outdoor recreational facilities and parks.²³ These differences could be due in part to differences in study methodology and perhaps regional differences in preferences or availability of/access to facilities.

The shift in the types, locations, and social contexts of physical activities found in this study could reflect, in part, the change in the types of physical activity opportunities provided in elementary and middle schools. For example, opportunities for recess are often reduced or become nonexistent as children transition from elementary to middle school, which may explain

in part the decrease in play activities found among boys and girls.^{3,26} Conversely, some opportunities may be available in middle but not elementary school, particularly through physical education or sport teams. Sex differences were present, which could reflect male/female activity preferences due to sex-related social norms and/or the characteristics of preferred activities, particularly in grade 7.

It is difficult to separate the effects of personal preference, sex-related social norms, and other social influences from opportunity; additional research is needed to examine the specific mechanisms operating. It is also possible that the physical and social environments influence boys and girls differently.^{22,35-39} Furthermore, the social context, the people with whom one is physically active, may be more salient for girls than boys.^{16,22,39} Similarly, different elements of the physical environment may be salient for boys and girls.^{24,39}

Limitations

Strengths of this study include addressing a variety of physical activity behaviors and their social contexts in a racially/ethnically diverse sample of boys and girls using a longitudinal design. Limitations include relying on self-reports of the activities and the contexts, and limited generalizability because data collection was limited to 2 communities within South Carolina. The Physical Activity Choices questionnaire was based on the 3DPAR questionnaire, which has been shown to be reliable and valid,³⁰ but the validity and reliability of this questionnaire have not been examined. Nevertheless, this study informs the current scientific literature about sex-specific physical activities, the physical and social contexts of these activities, and how these change between elementary and middle school.

Conclusions

Fifth grade boys and girls reported previous 5-day participation in calisthenics/exercise, running/jogging, playground games, and bicycling at similar frequencies and the frequencies of participation in all previous 5-day activities for boys and girls declined from grades 5 to 7. The percentage of boys and girls reporting playing with younger children outside of school significantly increased from fifth to seventh grade. In grade 7 compared to grade 5, boys and girls reported participating in more class/team contexts. Additional work is needed to discern the effects of changes in opportunity versus norms on changes in temporal and social patterns over time. Home and neighborhood were common locations for activities for boys and girls in fifth and seventh grades. Activities also took place at school and other community locations for boys and girls in grade 5; by grade 7 activities were still reported

in home and neighborhood but fewer participants reported activities in school and community settings.

IMPLICATIONS FOR SCHOOL HEALTH

These findings have important implications for physical activity programming and policies in school settings. The home and neighborhood were prominent locations for physical activities, with relatively few participants reporting being active in school or community settings or engaging in active transport, which suggests that physical activity opportunities in the school setting can play an enhanced role.⁴⁰⁻⁴² Specifically, daily physical education is recommended by many authoritative bodies including the Centers for Disease Control and Prevention, yet 4% or fewer elementary, middle, and high schools require daily physical education.⁴³ One review concluded that physical activity, including but not limited to recess, physical activity breaks, and physical activity in the classroom, is associated with academic benefits such as improved paying attention, concentrating, and on-task behavior,⁴⁴ and another review highlights the contribution of recess to social, emotional, and physical development.⁴⁵ Finally, although evidence for the benefits of active transport to school is accumulating, it is relatively uncommon in the United States, particularly in disadvantaged and rural areas.⁴⁶⁻⁴⁸ Walking or biking to school is more common among students who live closer to school,⁴⁹ but creative approaches, such as multimodal travel, may facilitate active transport among other youth.⁴⁶

Despite the potential benefits of integrating physical activity opportunities into the school routine, many challenges have been reported including a higher priority on academics and lack of facilities,⁵⁰ as well as inadequate capacity and insufficient funds.⁵¹ These barriers to school physical activity can be addressed by developing (1) supportive school leadership and champions;^{48,50,51} (2) collaborative partnerships between schools and local, regional and state resource agencies including establishing health councils;^{48,50,51} and (3) teacher and staff implementation capacity.⁵¹ These recommendations are consistent with Whole School, Whole Community, Whole Child,^{41,50} and Comprehensive School Physical Activity Program⁴⁰ approaches.

Finally, our results suggest that it is important to provide school physical activity opportunities that attend to the social environment of boys and girls by addressing their social preferences. Specifically, most activities for boys and girls take place in social groups with 1 or several others and, especially by grade 7, in class/team groups. This suggests the importance of building a social element into physical activity promotion for children and adolescents in school settings; for example, promoting physical activity as a

time to have fun with your friends. A similar approach has been successful with adolescent girls in high school settings.^{52,53} Additional research that examines the combinations of social support, encouragement, participation with, and/or social norms that are mediating the influence of the social environment on physical activity will better enable researchers and practitioners to develop policies and practices to promote physical activity for boys and girls.

Human Subjects Approval Statement

The Institutional Review Board at the University of South Carolina approved all study protocols (University of South Carolina Assurance number: FWA 00000404 /IRB Registration number: 00000240).

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