California Adolescents Are More Physically Active When They Have Greater Opportunities for Physical Activity in Their School and Community

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Summary

Physical activity is an important component of a healthy lifestyle, yet most teens fall short of recommended levels. This brief report presents research identifying community and school opportunities that predict how much physical activity California adolescents get. It also identifies differences in predictors for teen boys and girls that may help explain the marked gender disparities that currently exist in teen physical activity. Effective strategies to improve access to opportunities for teens to be physically active may help Californian teens meet physical activity guidelines and improve their overall health.

Background

Obesity is a serious public health issue affecting not only adults, but also children and adolescents.[1,2] Physical activity (PA) plays a central role for adolescents in attaining and maintaining a healthy weight, improving cardiovascular health, building bone and muscle strength, reducing chronic disease risk, and possibly reducing symptoms of anxiety and depression. To achieve these benefits of PA, all children and adolescents age 6-17 should get at least 60 minutes of moderate to vigorous intensity PA daily, through activities such as active play, sports, aerobic activities, and activities of daily life.[3,4]

Unfortunately, the majority of adolescents do not get sufficient PA. Nationwide, only 15% of high school students (grades 9-12) report getting 60 minutes of PA a day.[5] In a California survey of 12-17 year olds, 16% of teens met this same target.[6] Both surveys found that teen boys were twice as likely as teen girls to get 60 minutes of daily PA. A growing body of evidence supports the notion that when adolescents have greater opportunities to be physically active at school, safer neighborhoods, and better access to PA facilities in the community, they will be more physically active.[7-10]

This brief report describes the school and community PA opportunities found to predict the PA frequency (number of days in the last week with at least 60 minutes) and PA duration (number of minutes yesterday) of California adolescents. A second goal of this brief report is to identify whether there are differences in the PA opportunities that are important for predicting PA for adolescent boys and girls.

Data presented in this brief report were taken from the 2012 *California Teen Eating, Exercise, and Nutrition Survey* (*CalTEENS*). *CalTEENS* is a biennial statewide survey of 12-17 year old adolescents, designed to track changes in key dietary and PA indicators and related factors. (See Data Sources and Methods for a detailed description of this survey and Appendix 1 for a list of all variables included for this analysis).

Survey Findings

Physical Activity Opportunities at School

Teens spend a substantial amount of time at school, and the school environment can potentially offer numerous PA opportunities, such as physical education (PE) classes, school sports teams, and structured and unstructured activity on campus during the after school period. Our analyses showed that teens, both boys and girls, are physically active about one-fifth day more each week when they have more days per week of PE class, and two-thirds of a day more when they have more opportunities for PA after school[a]. In addition, having more after-school opportunities also predicts increased minutes of PA on the prior day for all teens (15 minutes for boys; 17 for girls), but PE only predicts increased minutes of PA for girls (6 minutes). Table 1 presents the changes in boys' and girls' PA associated with each variable. Detailed findings are presented in Appendices 2 and 3.

Table 1. Changes in Physical Activity Associated with School Opportunities

	Number of Days During the Week with ≥ 60 minutes of Physical Activity		
	Boys	**Girls**	**All Teens**
Average Number of Days During the Week with ≥ 60 minutes of Physical Activity	4.4	3.8	4.1
Household poverty status*	ns	+0.20	ns
School based factors			
Number of days/week in PE class	+0.22	+0.20	+0.25
After-school PA related opportunities**	+0.58	+0.75	+0.67
	Number of Minutes Physically Active Yesterday		
	Boys	**Girls**	**All Teens**
Total Number of Minutes Physically Active Yesterday	68.9	63.2	66.1
Household poverty status*	ns	+10.3	ns
School based factors			
Number of days/week in PE class	ns	+6.3	ns
After-school PA related opportunities**	+15.2	+16.9	+16.4

ns = non-significant

* Household poverty status was defined by the following four categories: Supplemental Nutrition Assistance Program (SNAP) participant household, ≤130% Federal Poverty Level (FPL)–not SNAP participant household, >130% to ≤185% FPL, and >185% FPL

** This is a composite, scaled variable representing four survey questions about school-site after-school physical activity opportunities and organized sports.

[a] After-school PA opportunities were assessed by combining four survey items: In the past 7 days, how many days did you participate in physical activity or sports on school grounds during after school programs? In the past 7 days, how many days did you participate in physical activity or sports on school grounds after school not as part of a program? How many days each week do you usually use the school gym or other sports facilities at school for physical activity after school and on weekends? During the past 12 months, on how many sports teams did you play? (Include any teams run by your school or community groups.)

Physical Activity Opportunities in the Community

Opportunities outside of school, as well as having a safe place to be active can be important for adolescents. Our analyses showed that all teens, both boys and girls, reported more days being physically active in the prior week when they participate in "individual sports" (e.g., martial arts, gymnastics, or dance), resulting in more than a half day more for boys and over a third of a day more for girls.

Boys participating in individual sports also reported an 8 minute longer duration of PA on the prior day compared to other boys. In addition, higher perceived neighborhood safety was a significant predictor of greater frequency (0.29 days per week) and duration of PA (12 minutes per day) for adolescent boys, but not girls. Detailed findings are presented in Appendices 2 and 3.

Table 2. Changes in Physical Activity Associated with Community Opportunities

	Number of Days During the Week with ≥ 60 minutes of Physical Activity		
	Boys	**Girls**	**All Teens**
Average Number of Days During the Week with ≥ 60 minutes of Physical Activity	4.0	2.5	3.3
Household poverty status*	ns	+0.20	ns
Community/Home based factors			
Perceived neighborhood safety**	-0.29	ns	-0.26
Participation in individual sports	+0.58	+0.38	+0.38
	Number of Minutes Physically Active Yesterday		
	Boys	**Girls**	**All Teens**
Total Number of Minutes Physically Active Yesterday	80.8	34.1	56.4
Household poverty status*	ns	+10.3	ns
Community/Home based factors			
Perceived neighborhood safety**	-12.0	ns	-8.3
Participation in individual sports	+8.4	ns	+6.6

ns = non-significant

* Household poverty status was defined by the following four categories: Supplemental Nutrition Assistance Program (SNAP) participant household, ≤130% Federal Poverty Level (FPL)–not SNAP participant household, >130% to ≤185% FPL, and >185% FPL

** "It is safe to be physically active by myself in my neighborhood" scaled 1=strongly agree to 5=strongly disagree

Summary and Conclusions

Being physically active is fundamental to health, yet few teens are sufficiently active to support good health. With a key priority of obesity prevention efforts focused on increasing low rates of PA, this analysis identified several important opportunities and behaviors at school and in the community that predict higher PA among California teens. California adolescents reported more PA or PA more often when they also reported:

SCHOOL

- More days per week spent in physical education (PE) class;
- More opportunities to be active after school;

COMMUNITY

- Participating in individual sports activities such as dance, gymnastics, or martial arts; and
- Perceiving that their neighborhood is a safe place to be physically active (teen boys only);

HOUSEHOLD POVERTY

- In addition to the school and community factors described above, household poverty status was associated with PA for teen girls. Girls from middle and higher income homes reported greater PA (teen girls only).
- There was no evidence of a link between household poverty status and PA for teen boys.

Different sets of predictors were found for adolescent boys and girls, suggesting that different strategies may be needed to most effectively reach them. In addition, these analyses found that lower income adolescents – especially lower income adolescent girls – are not getting sufficient PA, and may need a more supportive environment to help them change that.

This study points to evidence-based strategies that schools, communities, and policy makers can implement to provide a PA-friendly environment for teens. Policy makers should consider how they can support schools' efforts to require and provide daily PE, to offer sports and active programming after school, and to allow access to school facilities after hours through joint use agreements, especially in areas that lack parks and recreational facilities. Community groups, such as parks and recreation departments, community-based organizations, and faith organizations, can promote adolescent PA by offering a safe space, facilities, and equipment for team sports and individual sport activities, and to ensure the affordability of these programs for the populations they serve. Policy makers, neighborhood organizations, residents, and even teens themselves can collaborate to improve the safety of their communities so that all teens can get PA in their own neighborhoods. Identifying and utilizing effective strategies to improve opportunities for teens to be active in the places where they live, learn, and play can improve the health of California teens.

Data Sources and Methods

CalTEENS used both random-digit-dial (RDD) for a general population sample and Medi-Cal (CalFresh) list-assisted telephone interviews with random samples of California households receiving CalFresh to gather its data. The telephone interviews, conducted in English and Spanish, collect information from teens 12-17 years old regarding dietary intake, physical activity, weight status, and knowledge, attitudes, and beliefs about diet and exercise. The analyses in this report used information regarding physical activity and related factors (see Appendix 1 for all variables tested). In total, 1,143 teens completed the telephone interview. Cooperation rates were 46% for the CalFresh sample and 50% for the RDD sample. The weighting procedure included standard CalFresh and RDD and population adjustments. The data were post-stratified to adjust for variability in sex, age, and race/ethnicity between the sample and the population. The California population data are from the 2010 United States Census (U.S. Census Bureau).

This study used hierarchical multiple regression analyses to identify potential determinants of physical activity. Specifically, hierarchical multiple regression analyses were conducted entering poverty status in the first step to control for the effects of this variable, then the set of variables related to physical activity were entered in the second step. R^2 change values were used to determine significance of the set of variables and t-tests were used to determine significant individual variables. Analyses of *CalTEENS* data were conducted using SPSS Statistics 20.0 (SPSS Inc., 2011, Chicago, IL).

Limitations

There are some limitations of *CalTEENS* data used in this report. First, these analyses were conducted using both a sample of CalFresh recipients in California and a sample from the California general population, and therefore the results may not be generalizable to the general population in the State, other states, or the nation. However, all data were weighted and analyses controlled for the level of poverty status. Second, there is both a self-report and social desirability bias that may impact the data reported by respondents.

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References

1. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *JAMA.* 2012;307(5):483-490.
2. Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among US adults, 1999-2008. *JAMA.* 2010;303(3):235-241.
3. United States Department of Health and Human Services. *Physical Activity Guidelines for Americans, 2008.* Washington D.C.: United States Department of Health and Human Services;2008.
4. Physical Activity Guidelines for Americans Midcourse Report Subcommittee of the President's Council on Fitness Sports & Nutrition. *Physical Activity Guidelines for Americans Midcourse Report: Strategies to Increase Physical Activity Among Youth.* Washington, DC: U.S. Department of Health and Human Services;2012.
5. Centers for Disease Control and Prevention. Physical activity levels of high school students — United States, 2010. *MMWR.* 2011;60(23).
6. University of California Los Angeles Center for Health Policy Research. *2011-2012 California Health Interview Survey data file.* Los Angeles, CA: UCLA Center for Health Policy Research;2012.
7. Ding D, Sallis JF, Kerr J, Lee S, Rosenberg DE. Neighborhood environment and physical activity among youth a review. *Am J Prev Med.* 2011;41(4):442-455.
8. Millstein RA, Strobel J, Kerr J, et al. Home, school, and neighborhood environment factors and youth physical activity. *Pediatr Exerc Sci*. 2011;23(4):487-503.
9. Kim J. Are physical education-related state policies and schools' physical education requirement related to children's physical activity and obesity? *J Sch Health.* 2012;82(6):268-276.
10. Mota J, Almeida M, Santos R, Ribeiro JC, Santos MP. Association of perceived environmental characteristics and participation in organized and non-organized physical activities of adolescents. *Pediatr Exerc Sci.* 2009;21(2):233-239.

Appendix

Appendix 1. List of All Variables Tested

Dependent Variables
During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
Yesterday, about how many minutes were you physically active doing moderate or vigorous activities such as basketball, dancing, soccer, or brisk walking? Include ALL activities, such as PE class or classes outside of school.
Independent Variables
Demographic and Socioeconomic Factors
Gender (boy and girl)
Household Poverty Status (SNAP participant, ≤ 130% FPL, > 130% to ≤ 185% FPL, and > 185% FPL) [1]
School and After-School Factors
In an average week when you are in school, on how many days do you go to physical education (PE) classes?
How many days in a usual week do you walk, ride a bike, or skateboard on the way TO school?
Does your school offer physical activities after school, other than sports, such as dance, yoga, gymnastics, weight training, or martial arts?
After-School Physical Activity Opportunities (Composite of four questions below) [2]
In the past 7 days, how many days did you participate in physical activity or sports on school grounds during after school programs?
In the past 7 days, how many days did you participate in physical activity or sports on school grounds after school not as part of a program?
How many days each week do you usually use the school gym or other sports facilities at school for physical activity after school and on weekends?
During the past 12 months, on how many sports teams did you play? (Include any teams run by your school or community groups.)
Community Factors
It is safe to be physically active by myself in my neighborhood. Would you say you… [3]
There are playgrounds, parks, or gyms close to my home that are easy for me to get to. Would you say you… [3]
Are you currently involved in any individual sports such as dance, martial arts, or yoga?

Independent variables with a significant relationship to either dependent variable in the final model are shown in this table with italics.

[1] Household poverty status was defined by the following four categories: Supplemental Nutrition Assistance Program (SNAP) participant household, ≤ 130% Federal Poverty Level (FPL)–not SNAP participant household, > 130% to ≤ 185% FPL, and > 185% FPL.

[2] This is a composite, scaled variable representing four survey questions about school-site after-school physical activity opportunities and organized sports. Questions were combined due to high inter-correlations among them.

[3] Responses scaled 1=strongly agree to 5=strongly disagree.

Appendix 2. Opportunities to be Physically Active that Predict Frequency of Physical Activity, 2012 *CalTEENS*

Summary of Hierarchical Regression Model	All Teens (n = 1,036)			Teen Boys (n = 471)			Teen Girls (n = 564)		
	B	***SE***	***ß***	***B***	***SE***	***ß***	***B***	***SE***	***ß***
Variables									
Step 1									
Household Poverty Status[1]	.030	.027	.033	-.032	.037	-.036	.097	.038	.107*
Step 2									
Household Poverty Status[1]	.023	.026	.025	-.040	.036	-.044	.088	.036	.097*
Perceived neighborhood safety for PA[2]	-.304	.066	-.127***	-.336	.095	-.141***	-.171	.092	-.071
Number of days of PE per week	.121	.027	.122***	.114	.040	.111**	.092	.037	.097*
After-school PA-related opportunities[3]	.127	.011	.322***	.108	.014	.286***	.143	.015	.359***
Participation in individual sports (e.g. dance or martial arts)	.895	.130	.183***	1.180	.208	.214***	.832	.170	.185***
Model Fit	R^2	R^2_{change}		R^2	R^2_{change}		R^2	R^2_{change}	
Step 1	.001			.036			.107*		
Step 2	.197	.196***		.428	.182***		.473	.213***	

[1] Household poverty status was defined by the following four categories: Supplemental Nutrition Assistance Program (SNAP) participant household, ≤ 130% Federal Poverty Level (FPL)–not SNAP participant household, > 130% to ≤ 185% FPL, and > 185% FPL.

[2] "It is safe to be physically active by myself in my neighborhood" scaled 1=strongly agree to 5=strongly disagree.

[3] This is a composite, scaled variable representing four survey questions about school-site after-school physical activity opportunities and organized sports. Questions were combined due to high inter-correlations among them.

* p < .05, ** p < .01, *** p < .001

Appendix 3. Opportunities to be Physically Active that Predict Duration of Physical Activity, 2012 *CalTEENS*

Summary of Hierarchical Regression Model	All Teens (n = 1,035)			Teen Boys (n = 470)			Teen Girls (n = 564)		
	B	***SE***	***ß***	***B***	***SE***	***ß***	***B***	***SE***	***ß***
Variables									
Step 1									
Household Poverty Status[1]	1.902	.820	.068*	-.477	1.153	-.017	4.343	1.157	.155***
Step 2									
Household Poverty Status[1]	1.355	.823	.048	-1.692	1.166	-.061	4.515	1.165	.161***
Perceived neighborhood safety for PA[2]	-9.626	2.129	-1.31***	-14.156	3.100	-.190***	-5.457	3.000	-.073
Number of days of PE per week	1.699	.867	.056	.219	1.285	.007	2.866	1.201	.098*
After-school PA-related opportunities[3]	3.109	.342	.257***	2.869	.471	.240***	3.236	.496	.264***
Participation in individual sports (e.g. dance or martial arts)	15.510	4.211	.103***	22.961	6.755	.133**	8.626	5.541	.062
Model Fit	R^2	R^2_{change}		R^2	R^2_{change}		R^2	R^2_{change}	
Step 1	.005*			.000			.024***		
Step 2	.117	.112***		.124	.124***		.135	.111***	

[1] Household poverty status was defined by the following four categories: Supplemental Nutrition Assistance Program (SNAP) participant household, ≤ 130% Federal Poverty Level (FPL)–not SNAP participant household, > 130% to ≤ 185% FPL, and > 185% FPL.

[2] "It is safe to be physically active by myself in my neighborhood" scaled 1=strongly agree to 5=strongly disagree.

[3] This is a composite, scaled variable representing four survey questions about school-site after-school physical activity opportunities and organized sports. Questions were combined due to high inter-correlations among them.

* p < .05, ** p < .01, *** p < .001

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