January 2011

JOHN W. GARDNER CENTER *for Youth and Their Communities*

Community-Based After School Programs and Youth Physical Fitness

Rebecca A. London and Oded Gurantz

Background

At the request of Redwood City partners and with funding from the Robert Wood Johnson Foundation's *Salud America!* initiative, the John W. Gardner Center for Youth and Their Communities (JGC) at Stanford University undertook an analysis examining the extent to which after school program participation is associated with youth physical fitness outcomes using the Youth Data Archive (YDA). This research occurred in tandem with the launch of Redwood City 2020's wellness initiative, which aligns with the newly unveiled federal *Let's Move!* campaign, championed by First Lady Michelle Obama and backed by key federal agencies. Redwood City 2020 has adopted a set of four key goals to improve the wellness of young people in the community: (1) Increase easy everyday physical activity; (2) Make healthy food the easy, affordable and viable option; (3) Build social cohesion and maximize public spaces; and (4) Promote healthy practices in 2020 partner organizations so they serve as models for the community. The aim of *Let's Move!* is to eliminate childhood obesity within a generation and to promote physical activity, and access to and consumption of healthy food. The initiative also urges drawing on the community to promote health from within (Let's Move, 2010). In September 2010, the League of California Cities passed a resolution to support the tenets of *Let's Move!* with specific language related to each of the four Redwood City 2020 wellness goals (League of California Cities, 2010).

An extensive body of medical research shows that specifically designed physical activity-focused after school programming can lead to improvements in youth obesity and fitness outcomes (Ara et al., 2006; Elkins, Cohen, Koralewicz, & Taylor, 2004; Robinson, 1999; Story et al., 2003; Weintraub et al., 2008). Medical research also shows that improvement in physical health occurs both through increased activity level and decreased time spent engaged in sedentary activities such as watching television, playing video games, or excessive snacking, which are associated with increased obesity (Gortmaker et al., 1999; Mahoney, Lord, & Carryl, 2005; Motl, McAuley, Birnbaum, & Lytle, 2006; Robinson, 1999). However, the targeted anti-obesity programs on which these studies were based tended to be small, highly focused, and time-limited rather than the community-designed and led programs. As such, they tend to lack scalability and sustainability, which are critical for addressing this pervasive problem.

The literature on the effectiveness of after school programs more broadly highlights four key areas of adolescent development that after school programming can influence, including physical health (Eccles & Gootman, 2002). These studies are

focused on community-based after school programs, similar to those found in Redwood City. However, according to two recent reviews, the literature has not considered the physical health consequences of after school participation (Durlak & Weissberg, 2007; Lauer et al., 2006). It is therefore unknown whether after school programs that are developed and run by community practitioners and educators accrue health benefits for their participants in the same way as targeted anti-obesity programs.

In order to understand this issue further, we worked with after school providers, partners at Redwood City Schools District (RCSD) and Sequoia Union High School District (SUHSD), the City of Redwood City, and Redwood City 2020 to ask the following research questions:

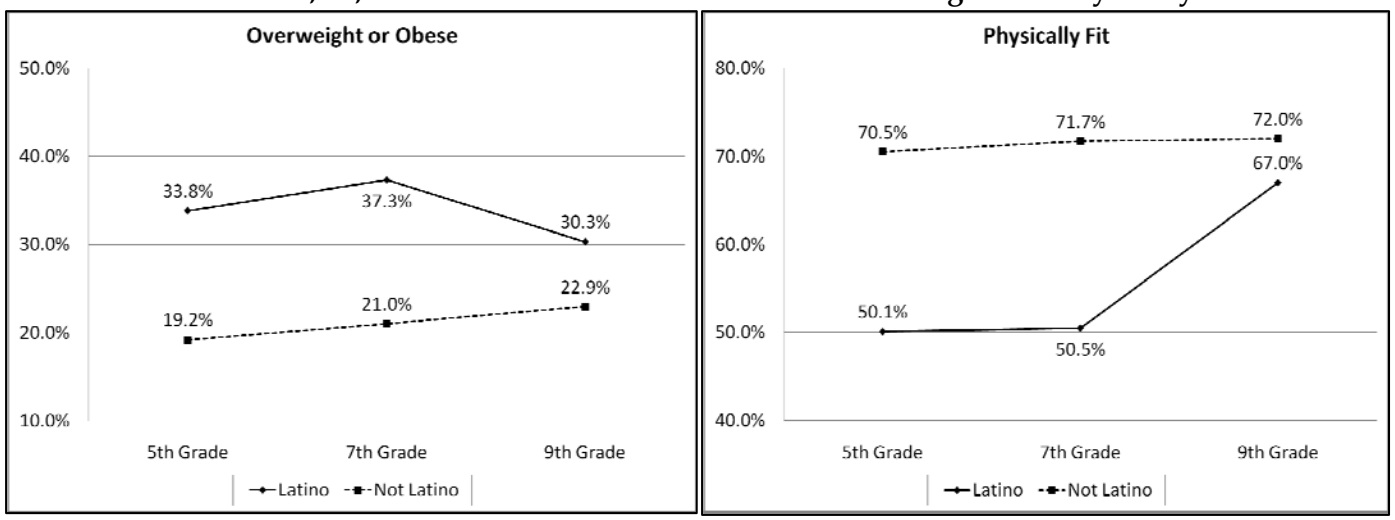
- What is the extent of participation in primarily fitness-focused and other types of after school programs? Which students are most likely to participate in each?
- What are the effects of participation in primarily fitness-focused and other types of programs on students' physical fitness trajectories over time? How does this vary for different student groups?

One caveat to this work is that we focus on physical activity as the conduit for fitness and overweight status. Students' nutrition is also an important input into their physical wellness, but available data do not include information on nutrition. We therefore focus this analysis exclusively on physical activity.

Youth Obesity and Physical Fitness

Exhibit 1 shows the physical fitness and overweight status of students in RCSD and SUHSD. Overweight and fitness status were determined using the California Physical Fitness Test (PFT), which is administered in fifth, seventh, and ninth grades and consists of the following six fitness components: aerobic capacity, body composition, abdominal strength and endurance, trunk extensor strength and endurance, upper body strength and endurance, and flexibility. We defined a student as "physically fit" if they passed five of the six PFT components, the standard used by the California Department of Education.

Exhibit 1: Percent of 5th, 7th, and 9th Grade Students Who Were Overweight and Physically Fit



The left panel shows that Latino students were much more likely to be overweight or obese in the younger grades, but that this gap narrowed for ninth graders, both because Latino rates declined and non-Latino

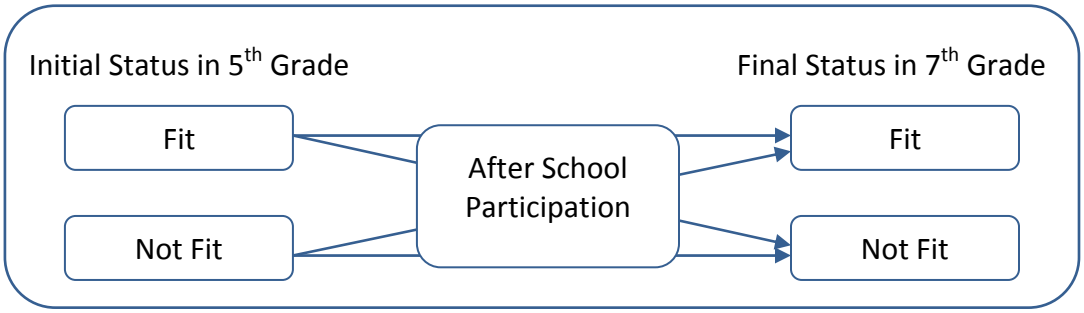
rates increased. This is mirrored in the right panel, which shows a similar physical fitness gap between Latino and non-Latino students in the younger grades that declined for ninth graders.

Participation in After School Programs

The following after school programs were included in this analysis : Redwood City Parks & Recreation, Police Activities League, Sequoia YMCA, Boys & Girls Clubs of the Peninsula, the Riekes Center for Human Enhancement, SUHSD after school sports teams, and other programs funded through RCSD's After School Education and Safety program (ASES). This group comprises some of the largest service providers in the area, but data limitations resulted in the exclusion of one key provider: the Sheriff's Activity League (SAL), which offers a primarily fitness-focused after school programs for the East side of Redwood City, where many of the younger and typically underserved students are located.[1]

To examine how students' physical fitness changed over time, we followed a cohort of students who took the PFT in 2006-07 and 2008-09, and examined their fitness and overweight status at the beginning of the period and then again at the end. This included a younger group of students who took the PFT in both fifth and seventh grades and an older group who took it in seventh and ninth grades. As Exhibit 2 illustrates, we then assessed whether a student participated in after school programs, both those that focused primarily on physical activities and those focused on other enrichment, several of which had fitness components as secondary program activities, between these two time periods. The analysis focused on whether participation in both types of after school programs was associated with higher levels of fitness at the end of the period, after controlling for students' initial fitness status, socioeconomic status, and other factors that might influence students' fitness trajectories.

Exhibit 2. Following Student Fitness and After School Participation Using the YDA

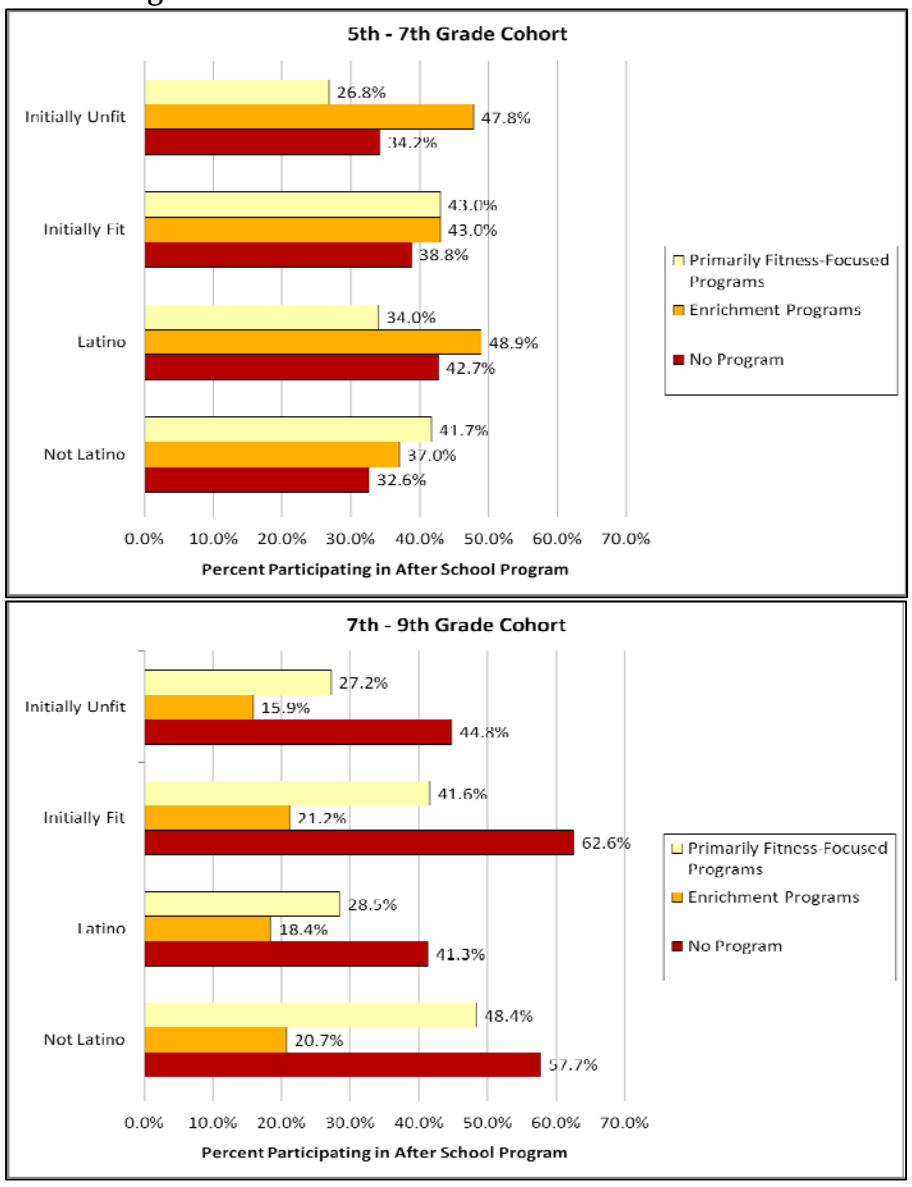


Programs categorized as "primarily fitness-focused" were predominantly concentrated on structured fitness activities, sports, or physical activity. "Other enrichment" or "other programs" were not primarily focused on these activities, but may have included physical activity components as a part of their programming. Overall, 64% of students in the fifth to seventh grade cohort participated in at least one of the after school programs included in this study, with 37% participating in primarily fitness-focused programs and 45% participating in other programs (students can participate in more than one kind). In the older cohort, 49% of students participated in after school programs, but about the same percent participated in primarily fitness-focused after school programs (36%).

[1] We conducted analyses that excluded students on the East Side and the results were unchanged.

Students participated in after school programs at different rates. Those who were physically unfit at the start of fifth grade were less likely to participate in primarily fitness-focused programs over the next two years (27%) than other types of after school programs (48%) (Exhibit 3, top panel). Students who were initially physically fit were equally likely to participate in primarily fitness-focused and other types of programs. Latino students, who were more likely to be overweight and less likely to be physically fit in fifth grade, were also less likely to participate in primarily fitness-focused programs after school than to participate in other programs. This was in part due to the overrepresentation of Latino students in ASES' other enrichment programs, which target students who need extra academic attention, including those still learning English.

Exhibit 3: Percent of Students Participating in Primarily Fitness-Focused and Other Enrichment After School Programs



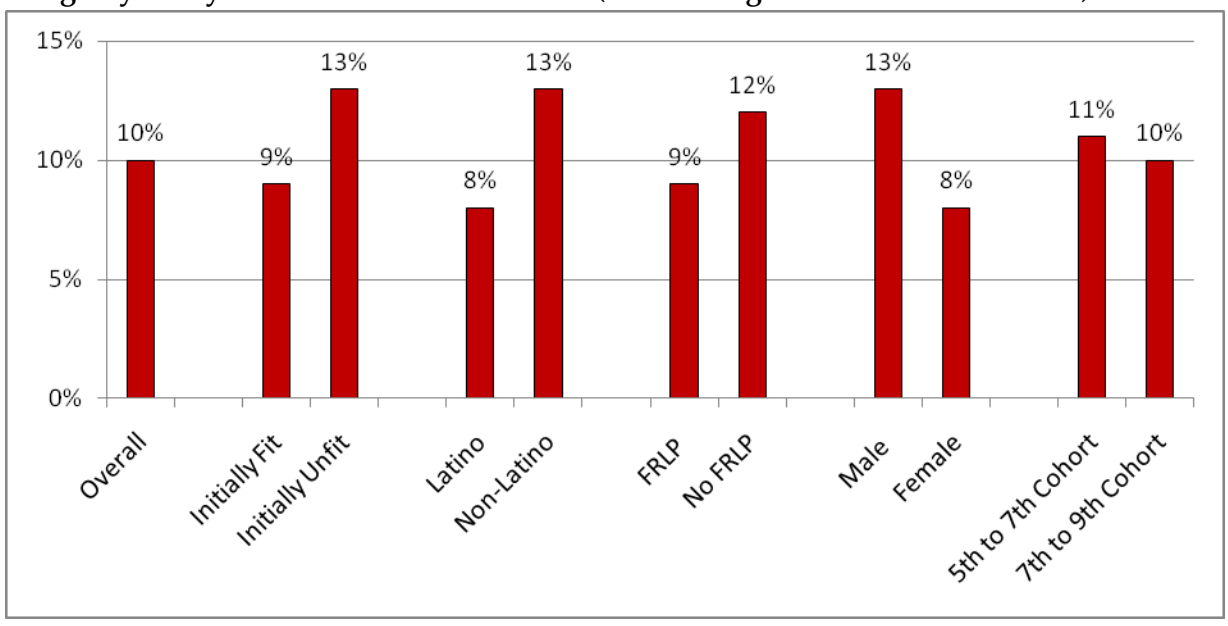
Note: The No Program category indicates that students were not enrolled in any of the programs examined for this study. They may have been enrolled in other programs for which we did not collect data.

Older students were far less likely to participate in after school programs of any kind, but when they did, they were more likely to participate in primarily fitness-focused programs after school, especially among ninth graders, who participated mainly in high school sports (Exhibit 3, bottom panel). Similar disparities in participation existed for the older age group as well, with Latino students or students who began seventh grade physically unfit having lower levels of participation in primarily fitness-focused programs than those who were not Latino or initially fit.

Linking After School Participation to Physical Fitness Outcomes

In order to assess who benefited most from participation in primarily fitness-focused after school programs, we estimated the relationship between after school participation and fitness status for a variety of different subgroups—low and high income students, Latino and non-Latino students, boys and girls, those who were initially fit and unfit. Exhibit 4 shows a positive effect of participating in primarily fitness-focused after school programs overall and for all of the subgroups we examined. Each of these effects is also statistically significant. After controlling for initial fitness level, we found that primarily fitness-focused after school participation was associated with a 10% increase in the likelihood of being physically fit. The effect of participation was largest among those who were initially unfit, male and non-Latino. Although not shown, we also found that students who participated in two years of primarily fitness-focused after school programs were more likely to be physically fit than students with one year of primarily fitness-focused after school participation (15% more likely compared to 9% more likely).

Exhibit 4: Effect of Participating in Primarily Fitness-Focused Programs After School on Likelihood of Being Physically Fit at End of Cohort Period (Controlling for Initial Fitness Level)



We did not find any effect of participating in other enrichment programs, including those with a partial fitness focus, on fitness status overall or for any of the subgroups. We conducted the same analysis using overweight status as the outcome and found that participating in primarily fitness-focused programs after

school reduced the likelihood of being overweight at the end of the cohort period, but the magnitude of the effect was smaller and none of the overall or subgroup findings reached statistical significance.

These results point to the potential for after school programs that are primarily fitness-focused to improve youth fitness. However, this analysis cannot make causal claims about this effect because we are unable to observe whether program participants engaged in other healthy behaviors that might have made them more likely to be physically fit even without their after school participation.

Implications of this Study

Findings from this study support the notion that primarily fitness-focused after school programs run by community organizations and agencies can help students to maintain or improve their fitness levels. Results indicate that participation in primarily fitness-focused programs after school is associated with a 10% increase in the likelihood of being fit over time. However, not all students participate in these programs at the same rate, with students who are Latino, English learners, and unfit participating at lower rates.

These findings also support the approach of Redwood City 2020 and *Let's Move!* to engage community partners in the quest to create healthy communities and children by focusing on after school programs that promote improved fitness. Existing programs run by community organizations in Redwood City are already having an effect on students' health and fitness. However, for the highest risk groups—lower income and Latino students—we found lower levels of participation in primarily fitness-focused programs and smaller effects of participation on fitness outcomes. A number of factors may be influencing participation for these groups, including the cost of sports and fitness programs and gear required to participate. Geographic barriers may also be an issue as the primarily fitness-focused programs utilized in this analysis are more often located in the west part of Redwood City, whereas the Latino population lives predominately in the east part of town. Another reason for lower participation, especially among younger students, may be that those who were struggling in school, including English learners, were more likely to attend to ASES-funded enrichment programs that take place on eight of RCSD's campuses. These programs include multiple components, including a focus on academics, enrichment, and physical activity. Lack of fitness and need for academic support are themselves linked (London & Castrechini, 2009). The duality of these problems is a key challenge for policy makers and practitioners.

There are a variety of ways that communities and schools have begun to address this issue. In spring 2010, the San Mateo County Health System released an update to its Get Healthy San Mateo County initiative that described the need to "improve food and physical activity in the school environment" as one of three major areas of focus (County of San Mateo, 2010). Across communities nationwide, many of the attempted solutions to the problem of childhood obesity revolve around the school day because that is a natural place to address childhood needs. As such, interventions have been introduced before, during, and after school when students are on school campuses. These can include physical activity focused programs, including before school programs – like the walking school bus in Redwood City that aims to get kids to walk or bike to school; after school fitness programs, such as those operated by the Redwood City Parks and Recreation Department; recess-based programs that encourage kids to play; and physical education classes as part of the core curriculum. Programs also focus on nutrition, including the creation of community gardens at school sites, as Redwood City has done; improving the nutritional content of school meals; and removing

unhealthy food and drinks from vending machines on school campuses. Outside the school day, interventions nationwide have focused on parents and families by providing nutrition education and family opportunities for physical activity. The San Mateo County Health System also initiated a Retail Food Environment Index (RFEI) that assesses communities on their balance of healthy and unhealthy food outlets. Additionally, communities have begun addressing built environment issues by opening school facilities on weekends and during the summer for greater access to pools and playing fields, and helping to clean up parks so that they are accessible and safe for families.

Focusing specifically on after school programs, findings from this study point to the importance of identifying and engaging youth in fitness-focused activities after school, and if possible, focusing on student populations less likely to participate. Activities that are primarily focused on sports, fitness or physical activity were shown to have the strongest positive effects on youth physical fitness outcomes. However, Latino and initially unfit students had lower rates of participation in these primarily fitness-focused programs. Findings have ramifications for both the targeting and content of after school programs. This work suggests that communities and school districts looking to align with *Let's Move!* might consider ways to assist academically-focused after school programs to include fitness components that can benefit all students.

References

Ara, I., Vicente-Rodriguez, G., Perez-Gomez, J., Jimenez-Ramirez, J., Serrano-Sanchez, J. A., Dorado, C., et al. (2006). Influence of extracurricular sport activities on body composition and physical fitness in boys: a 3-year longitudinal study. *Intl J Obes, 30*(7), 1062-1071.

County of San Mateo. (2010). *Strategies for Improving Food & Physical Activity Environments in San Mateo County*: Get Healthy San Mateo County.

Durlak, J. A., & Weissberg, R. P. (2007). *The impact of after-school programs that promote personal and social skills*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.

Eccles, J. S., & Gootman, J. A. (2002). *Community Programs to Promote Youth Development*. Washington, D.C.: National Academies Press.

Elkins, W. L., Cohen, D. A., Koralewicz, L. M., & Taylor, S. N. (2004). After school activities, overweight, and obesity among inner city youth. *Journal of Adolescence, 27*(2004), 181-189.

Gortmaker, S. L., Peterson, K., Wiecha, J., Sobol, A. M., Dixit, S., Fox, M. K., et al. (1999). Reducing obesity via a school-based interdisciplinary intervention among youth. *Archive of Pediatric & Adolescent Medicine, 153*, 409-418.

Lauer, P. A., Akiba, M., Wilkerson, S. B., Apthorp, H. S., Snow, D., & Martin-Glenn, M. L. (2006). Out-of-School-Time Programs: A Meta-Analysis of Effects for At-Risk Students. *Review of Educational Research, 76*(2), 275-313.

League of California Cities. (2010). Final Report Resolutions Approved.

Let's Move. (2010). Retrieved October 4, 2010, from http://www.letsmove.gov/

London, R. A., & Castrechini, S. (2009). *Linking physical fitness and academic outcomes among Redwood City youth*. Palo Alto, CA: John W. Gardner Center for Youth and Their Communities at Stanford University.

Mahoney, J. L., Lord, H., & Carryl, E. (2005). Afterschool Program Participation and the Development of Child Obesity and Peer Acceptance. *Applied Developmental Science, 9*(4), 202-215.

Motl, R. W., McAuley, E., Birnbaum, A. S., & Lytle, L. A. (2006). Naturally occurring changes in time spent watching television are inversely related to frequency of physical activity during early adolescence. *Journal of Adolescence, 29*(1), 19-32.

Robinson, T. N. (1999). Reducing Children's Television Viewing to Prevent Obesity: A Randomized Controlled Trial. *JAMA, 282*(16), 1561-1567.

Story, M., Sherwood, N., Himes, J., Davis, M., Jacobs, D. J., Cartwright, Y., et al. (2003). An after-school obesity prevention program for African-American girls: the Minnesota GEMS pilot study. *Ethn Dis, 13*(1 Supplement 1), S54-64.

Weintraub, D. L., Tirumalai, E. C., Haydel, K. F., Fujimoto, M., Fulton, J. E., & Robinson, T. N. (2008). Team Sports for Overweight Children: The Stanford Sports to Prevent Obesity Randomized Trial (SPORT). *Archi Pediatr Adolesc Med, 162*(3), 232-237.

The John W. Gardner Center for Youth and Their Communities (JGC) would like to thank Salud America!, an initiative of the Robert Wood Johnson Foundation spearheaded by the University of Texas Health Science Center at San Antonio for funding this research. The JGC would also like to thank our partners in the school districts and the after school programs for contributing to this project. The JGC also appreciates the comments and suggestions provided by participants at the 2010 Society for Research on Adolescence Bi-Annual Conference in Philadelphia and the 2009 and 2010 Salud America! Conferences in San Antonio, TX.

For more information about the study on "Community-Based After School Programs and Youth Physical Fitness," please contact Rebecca London at rlondon@stanford.edu.

John W. Gardner Center for Youth and Their Communities
Stanford School of Education
505 Lasuen Mall
Stanford, CA 94305-3083

Tel: (650) 723-1137
Fax: (650) 736-7160
Email: gardnercenter@lists.stanford.edu
Web: http://gardnercenter.stanford.edu