

## Targeting the Body and the Mind: Evaluation of a P.E. Curriculum Intervention for Adolescents

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### Abstract

P.E. classes are often the only opportunity for inner-city youth to engage in physical activity, but budget cuts and pressure to perform well on standardized tests has made P.E. an afterthought for many school administrators. This study evaluated the effectiveness of a new P.E. curriculum in five Los Angeles inner-city schools. Interviews were conducted with eight teachers, and surveys were administered to students and parents before and after curriculum implementation. 640 pretest and 584 posttest student surveys, and 234 pretest and 176 posttest parent surveys were completed. FITNESSGRAM test scores for 389 matched pretest/posttest students were also analyzed, and a McNemar's test for significance was applied. The FITNESSGRAM scores were compared with control groups in the five schools and school district and state averages. Teachers found the curriculum "highly effective" and noted higher student participation than in previous curricula. Statistically significant differences were found in student confidence, P.E. enjoyment, knowledge about fitness, and performance at the FITNESSGRAM test. Significantly more students passed the test after the completion of the curriculum and with better scores, performing better than the control groups. The curriculum implementation showed promising results in boosting student confidence levels and performance in physical activity.

**Keywords:** adolescent; fitness; exercise; physical activity, physical education

### 1. Introduction

In the United States, childhood obesity rates have more than tripled since 1980. As a result, more than one-third of children ages 10-17 are today obese or overweight (Ogden et al. 2008). These statistics translate to 23 million children and adolescents who are overweight or obese nationwide. Childhood obesity often leads to serious health conditions in children, and studies have found that significant numbers of overweight children become obese adults (Whitaker et al. 1997). Childhood obesity is also associated with higher risks for cardiovascular disease and several cancers in adults (Biro and Wien 2010). In addition to health risks, obesity has also been linked to negative behavioral effects among adolescents. Thus, scholars have found strong associations between child obesity and absenteeism (Geier et al. 2007), negative behavior and low self esteem (Griffiths et al. 2010). Indeed, obese adolescents have been found to show lower levels of social integration, less positive self-perception, and more problems with peers, when compared with adolescents of normal weight (Ali et al. 2012; Braet et al. 1997; Drukker et al 2009).

Childhood obesity in Los Angeles County is higher than the state and national averages, with 23% of youth characterized as obese and another 19.4% as overweight (LA County Department of Public Health 2011). While obesity rates have stabilized in the last few years, disparities among ethnic/racial groups persist in LA County, with 34.9% of Pacific Islander, 27.4% of Hispanic, and 21.6% of African American adolescents characterized as obese, compared to 12.1% of Asian and 12.8% White obese adolescents (LA County Department of Public Health 2008). Nationwide and in Los Angeles County, childhood obesity is inversely correlated with socioeconomic status (LA County Department of Public Health 2008; Ogden et al. 2010).

A contributor to childhood obesity stems from limited access to free and safe space for physical activity outside of school. For example, the city of Los Angeles has only 6.2 acres of parks per 1000 residents (Trust for Public Land 2010), and this amount is much smaller in the high-density inner city neighborhoods (City Project 2006). Only 25% of children in Los Angeles live within a quarter mile of a park, and often parents perceive inner-city parks as unsafe and gang-controlled (Loukaitou-Sideris and Sideris 2010).

Because of the lack of adequate outdoor space and affordable indoor resources for exercise, physical education (P.E.) classes are often the only opportunity for inner city youth to engage in physical activity. However, with recent budget cuts and increasing pressure to perform well on standardized academic tests, P.E. has become an afterthought for many school administrators (Mahar et al. 2006). The median P.E. budget for U.S. schools was only \$764 per school year in 2010 (National Association for Sports and Physical Education & American Heart Association 2010), and 69% of high school- and 96% of elementary school students do not receive daily physical education classes (Centers for Disease Control and Prevention 2011; Lee et al. 2006). The lack of physical activity among California students is also reflected in their results on the California state-mandated fitness test, the FITNESSGRAM. In 2012, close to half of students in California failed to pass the FITNESSGRAM test (40.6% of 9<sup>th</sup> graders, 44.9% of 7<sup>th</sup> graders). Los Angeles Unified School District (LAUSD) students performed even worse with 51.5% of 9<sup>th</sup> graders and 56.2% of 7<sup>th</sup> graders failing the test (California Department of Education 2013).

To increase the quality of children's physical activity, a nonprofit, the Sound Body Sound Mind Foundation (SBSM), introduced a special P.E. curriculum in a number of inner city Los Angeles schools. The purpose of this study was to provide an evaluation of the effectiveness of the SBSM curriculum as applied at five inner city LAUSD schools and determine its effect on fitness among the participating students.

### 1.1 The SBSM Curriculum

The SBSM curriculum is influenced by Susan Harter's Confidence Motivation Theory that believes that a student's confidence, self-esteem, and competence motivation increase, when he/she successfully masters a task (Harter 1982). Social support from teachers, parents, coaches, and peers plays an important role in students' perception of self-worth (Figure 1).

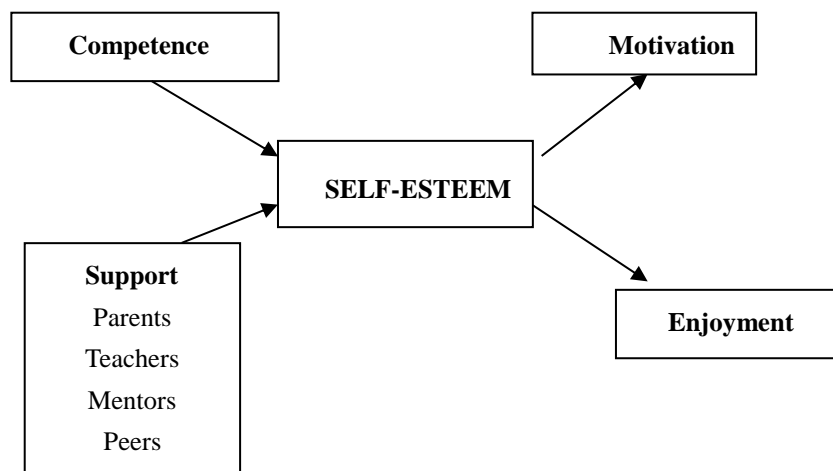


Figure 1. Competence Motivation Theory by Susan Harter (1982)

The curriculum includes training workshops for P.E. teachers including strategies and best practices for building confidence, eliminating intimidation among students, and creating safe, welcoming, and effective P.E. environments. Teachers participate in two 2-hour training workshops prior to the initiation of the curriculum in their classes. The workshops teach P.E. instructors about the benefits of choices to students, breaking social niches, creating opportunities for the development of competence with physical activity, and creating a classroom environment where all students would feel related to the group. Emphasis is placed on the importance of creating activities that are feasible for students of all backgrounds and physical abilities. Teachers are encouraged to (1) greet students by name; (2) not use nicknames; (3) encourage mistakes; (4) not punish with exercise; (5) not let students pick teams; and (6) end each class as a group with a "big finish."

The curriculum includes thirty lessons, which evolve around the mastery of a number of physical tasks by students. Each lesson includes a Warm-up (6-10 minutes), Workout (12-18 minutes), and Cool Down (4-10 minutes) session. The Work Out session takes place at 4-6 "stations" where different P.E. equipment is provided to help a particular physical activity (lower-body strength, core/upper-body strength, coordination, object manipulation, aerobic and locomotor exercises, etc). Student groups rotate from station to station, and depending on the P.E. class duration, students are instructed to complete 3-6 rotations during each P.E. session. P.E. equipment includes balls, cones, free-weights, jumping ropes, exercise mats, agility ladders, and marking tape. These activities are designed for small spaces and do not depend on gyms or large multipurpose rooms, which are rather rare in many inner-city schools.

## 2. Method

### 2.1 Participants and Settings

The SBSM curriculum was introduced in some P.E. classes of five inner city Los Angeles schools between January and April 2013. To conduct an evaluation of the curriculum, we administered pretest and posttest interviews to teachers and pretest and posttest surveys to parents and students participating in the curriculum in January 2013 and April 2013 respectively. All surveys were distributed in English, Spanish, and Korean, and parents and students could choose to respond in any of these languages. We also acquired and analyzed the results of the FITNESSGRAM tests that were administered by the P.E. teachers to their students immediately prior to the initiation of the curriculum (between January 7-11, 2013), and immediately after its completion (between March 11-15, 2013). We compared the pretest and posttest scores, and also examined how the posttest scores for seventh and ninth-grade students compared to the LAUSD and California State averages for the same grades, as well as to the scores of all other seventh and ninth grade classes in each of the 5 schools that did not participate in the SBSM curriculum, and which served as controls for the study.

The research population consisted of students (from 7<sup>th</sup> to 10<sup>th</sup> grade) attending P.E. classes during the academic year 2012-2013 in the five inner-city LAUSD schools. The five schools ranged in size from 410 to 1030 students. Student population matched closely the demographics of the schools' surrounding area, which is heavily Latino and very low-income. A total of 640 (316 girls and 314 boys) students participated in the study. Seventy-seven percent of these students were Latino, 13.5% were Asian American (mostly Korean-American), 3.1% were African American, and 2% were White. Because the study followed a pre/posttest protocol, students were chosen to participate if they were attending the P.E. classes of eight teachers, who had been previously trained in the SBSM curriculum, and who were planning to administer the curriculum in their class.

Students participating in the study, their parents and P.E. teachers were asked to respond to pretest and posttest questionnaires. More specifically, a 17-item pretest survey and a 26-item posttest survey were administered to the students. In addition to gathering information about the socio-demographic characteristics of the students, these surveys asked a series of questions to establish student perceptions and confidence levels towards P.E., fitness, and exercise, favorite P.E. activities, frequency and context of physical activities before and after the administration of the SBSM curriculum. The post survey also inquired about student perceptions regarding the effectiveness of the SBSM curriculum.

A 22-item pretest survey and a 21-item posttest survey were administered to the parents of students participating in the study to identify parental perceptions and behavior in regards to fitness and exercise. More specifically, the surveys asked parents about their perceived efficacy of their children's physical activity in general and at school, their children's confidence levels with P.E., and the importance that they themselves attribute to physical activity. Parents were also asked about their own activity patterns, and if they exercise with their children. The posttest survey also asked parents if they had noticed differences in their children's attitude towards school and exercise.

Face-to-face interviews were also conducted before and after the implementation of the SBSM curriculum with eight teachers who taught it. The pre-curriculum interviews sought to identify the teachers' expectations and anticipated challenges in teaching the curriculum, while the post-curriculum interviews asked teachers to evaluate the curriculum's effectiveness and discuss the encountered challenges and outcomes.

Prior to the initiation of the study the research protocol was approved by the LAUSD Committee for External Research Review. The eight participating P.E. teachers were asked to administer the pre- and post-curriculum student surveys in their classes. The teachers also distributed the parent surveys to students and asked them to take it home for their parents to fill out and bring it back by the end of the week. An information sheet about the study and a consent note were sent to all parents indicating that they had the right to exclude their child from the evaluation. Students were also asked for their consent to participate in the study and were told that nonparticipation would not result in any positive or negative outcome for them. The P.E. teachers were asked to assign a special identification number to each of their students in the study to protect their anonymity. Similar to all other P.E. teachers in California, the eight participating teachers had also been trained to administer the FITNESSGRAM test to their students.

## 3. Results

We received back a total of 640 pretest and 584 posttest student surveys. The study generated a total of 389 participants with matched pre/posttests and FITNESSGRAM tests. We also received 234 pretest and 176 posttest completed surveys from parents.

### 3.1 Teacher Interviews

The eight teachers interviewed were quite diverse in terms of gender (5 male, 3 female); race/ethnicity (3 Latinos, 2 African Americans, 2 Asian Americans, and 1 Caucasian), and years of experience as P.E. instructors (5 to 28 years,

median 13.5 years). In their interviews prior to the initiation of the SBSM curriculum, all eight teachers expressed positive expectations from the curriculum but also anticipated some challenges such as possible lack of motivation from students, large class sizes (ranging from 40 to 68 students), lack of appropriate space for the equipment, and the relatively short length of classes. Some teachers worried that students who want to play sports would not appreciate a curriculum about fitness. As reasoned by one teacher:

“The athletes, they would just want to play games, and they will not want to do the stations. We will have to switch their mindset of how we do things, and why we are doing them—pretty much getting the culture changed in that we do physical fitness now instead of sports” (male, Latino teacher with 5 years of experience).

On the other hand, some teachers expected that students who get intimidated by sports “*can relax and have more fun*” (male, Asian-American teacher with 28 years experience).

During the post-curriculum interview, teachers mentioned encountering some challenges related to the newness of the curriculum, and the tightness of time allocated to P.E. As explained:

“The biggest challenge was to introduce the new concepts. But it did get easier. As we did it more and more, they got used to it pretty quickly” (male, Asian American teacher with 15 years of experience).

“In a short class, such as a 60-minute period where you are dressing and undressing, spending 10 minutes on either side, you only have about 30-40 minutes left, which is just enough time to get the whole circuit done” (female, Caucasian teacher with 9 years of experience).

All teachers assessed the SBSM curriculum as “highly effective” and credited it with an overall improvement in the fitness of their students, and making them more knowledgeable about physical activity and exercise. Despite the initial fear of some teachers that students preoccupied with sports would not enjoy the curriculum, the teachers noted higher student participation rates in the SBSM curriculum than in previous P.E. curricula, and attributed this to the “hands-on” activities and the fact that the rotating-station format managed to engage all students simultaneously. As explained:

“Everyone got the chance to do exercises. And overall they were easy to follow workouts, self-explanatory; so kids participated. It was great to have the SandBells, cones, jumping ropes. There was a lot of active participation and not just waiting in line, which happens a lot in other gym classes” (male, Asian-American teacher with 28 years experience).

“In SBSM, I had about 99% participation, while in swimming right now I have 25-30%” (male, Latino teacher with 5 years of experience)

“Students learned that fitness can be fun, and I think that will help in the long term and create healthy habits” (female, African American teacher with 27 years of experience).

### 3.2 Parent Surveys

The vast majority of parents surveyed expressed the view that physical activity is very important for their children (Table 1). In the posttest survey, 8.3% more parents indicated that their child is physically active at school at least 4 days per week. Most parents (70.9 % pretest-76.1% posttest) found that the amount of P.E. that their child receives at school is “just right,” and the percentage of parents with this view increased slightly after the second survey. Most of the parents in the pre-curriculum survey believed their child to be “somewhat fit” (47.0%) or “very fit,” (42.3%) but such sentiments were often not justified by the child’s performance in the first FITNESSGRAM testing. As indicated by  $\chi^2$ -tests, changes in parental perceptions (as expressed in the pretest and posttest surveys) were not statistically significant (Table 1). When explicitly asked about the impact of the SBSM curriculum on their child, 58.5% of the parents indicated no change, but 33.5% reported that their child exercises more, and 37.5% that their child is more interested in physical activity.

Table 1. Parents' Survey: Selected Pre/Posttest Results

	Pretest N=234	Posttest N=176	p
My child is physically active <u>outside</u> the school everyday	19 (8.2%)	24 (13.6%)	0.07
My child is never physically active <u>outside</u> the school	38 (16.3%)	26 (14.8%)	0.68
My child is physically active <u>at school</u> 4 times per week or more	83 (35.5%)	77 (43.8%)	0.08
My child's school PE class is very effective in making my child physically fit	112 (47.9%)	84 (47.7%)	0.98
My child's school PE class is somewhat effective in making my child physically fit	80 (34.2%)	70 (39.8%)	0.24
My child's school PE class is ineffective in making my child physically fit	14 (6.0%)	5 (2.8%)	0.13
The amount of physical activity that my child gets (inside and outside school) is too little	51 (21.8%)	35 (19.9%)	0.64
The amount of physical activity that my child gets (inside and outside school) is just right	166 (70.9%)	134 (76.1%)	0.23
The amount of physical activity that my child gets (inside and outside school) is too much	11 (4.7%)	7 (4.0%)	0.72
My child enjoys physical activity very much	139 (59.4%)	110 (62.5%)	0.52
My child enjoys physical activity only some times	76 (32.5%)	52 (29.5%)	0.52
My child never enjoys physical activity very much	13 (5.6%)	8 (4.5%)	0.65
My child is very fit	99 (42.3%)	77 (43.8%)	0.77
My child is somewhat fit	110 (47.0%)	89 (50.6%)	0.47
My child is not fit	22 (9.4%)	10 (5.7%)	0.16
I believe that physical activity is very important for my child	213 (91.0%)	153 (86.9%)	0.18
I exercise regularly with my family	28 (12.0%)	23 (13.1%)	0.73
I exercise at least 4 times per week	56 (23.9%)	49 (27.8%)	0.37
I exercise once per week or less	62 (26.5%)	33 (18.8%)	0.06
I never exercise	28 (12.0%)	20 (11.4%)	0.85
Have you seen change in your child's attitude towards exercise?			
o My child exercises more			
o My child exercises less		59 (33.5%)	
o My child is more interested in physical activity		8 (4.5%)	
o My child is less interested in physical activity		66 (37.5%)	
o No change		7 (4.0%)	
o Don't know		103 (58.5%)	
		20 (11.4%)	

### 3.3 Student Surveys

About half the students (49.4%) reported enjoying P.E. "a lot" during the pre-curriculum survey; this percentage increased to 55.3% in the post-curriculum survey, and this change was statistically significant ( $p < 0.05$ ). There was a statistically significant gender difference in student responses with only 35.9% (pretest) - 39.9% (posttest) female students stating that they enjoy P.E. a lot, compared to 63.6% (pretest) - 70.9% (posttest) male students ( $p < 0.001$ ). Girls also reported exercising on average less than boys and feeling less confident in their ability to exercise or play sports. Increased numbers of students in the posttest survey indicated that they participate comfortably in every activity, and this change was statistically significant ( $p < 0.05$ ). There was also a statistically significant increase of 9% in the number of students stating that they know a lot about fitness and exercise from the pretest to the posttest survey ( $p < 0.001$ ), and a statistically significant increase of 8.4% in the number of students reporting being active in P.E. and/or sports at least 4-5 times per week ( $p < 0.01$ ). 16.4% of the students characterized the SBSM curriculum as "extremely effective," and 35.4% as "quite effective," while 4.5% did not find it effective; 22.9% reported being "more knowledgeable," and 57.0% "somewhat more knowledgeable" about fitness and exercise than before, while 15.8% saw no change. Lastly, 10.8% of students characterized themselves as "much more fit," 29.8% as "more fit," and 39.6% as "somewhat more fit," while 14.9% saw no change, and 2.9% reported "less fit" after the completion of the SBSM curriculum (Table 2).

Table 2. Students' Survey: Pre/Posttest Results

	Pretest N=640	Posttest N=584	p
I enjoy attending PE a lot	316 (49.4%)	323 (55.3%)	0.037*
I do not enjoy attending PE	20 (3.1%)	14 (2.4%)	0.439
I participate comfortably in every PE activity	256 (40.0%)	271 (46.4%)	0.023*
I face difficulty or cannot do many PE activities	17 (2.6%)	10 (1.7%)	0.261
I believe that exercise is very important	449 (70.2%)	444 (76.0%)	0.020*
I know a lot about fitness	81 (12.7%)	127 (21.7%)	0.000***
I know very little about fitness	86 (13.4%)	47 (8.0%)	0.002**
I am very confident in my ability to exercise	229 (35.8%)	245 (42.0%)	0.026*
I am not confident in my ability to exercise	30 (4.7%)	31 (5.3%)	0.618
I am very fit	139 (21.7%)	149 (25.5%)	0.117
I am not fit at all	74 (11.6%)	59 (10.1%)	0.412
I am active in PE and/or sports at school 4-5 times per wk	178 (27.8%)	211 (36.1%)	0.002**
I am never active in PE and/or sports at school	33 (5.2%)	19 (3.3%)	0.099
I exercise or play sports outside school at least 4-5 times/wk	193 (30.2%)	197 (33.7%)	0.179
I never exercise or play sports outside school	48 (7.5%)	34 (5.8%)	0.240
I exercise regularly with my family	34 (5.3%)	30 (5.1%)	0.890
I never exercise with my family	351 (54.8%)	292 (50.0%)	0.090
I found the SBSM curriculum:			
o Extremely effective		96 (16.4%)	
o Quite effective		207 (35.4%)	
o Somewhat effective		209 (35.8%)	
o Not very effective		35 (6.0%)	
o Not at all effective		26 (4.5%)	
After completing the SBSM curriculum, I am:			
o Much more fit		63 (10.8%)	
o More fit		174 (29.8%)	
o Somewhat more fit		231 (39.6%)	
o No change		87 (14.9%)	
o Less fit		17 (2.9%)	
Comparing your knowledge about fitness now and before the SBSM curriculum, would you say that at now you are:			
o More knowledgeable		134 (22.9%)	
o Somewhat more knowledgeable		333 (57.0%)	
o No change		92 (15.8%)	

\* p < 0.05 \*\* p < 0.01 \*\*\* p < 0.001

### 3.4 Fitnessgram Testing

In order to pass the FITNESSGRAM, students must achieve the pre-determined passing scores on five of six assessments covering muscular strength, muscular endurance, aerobic capacity, flexibility and body composition. Students witnessed a significant increase in their FITNESSGRAM performance after the completion of the SBSM curriculum. While only 20% of the students passed the test prior to the initiation of the curriculum, 60% did so after its completion. Not only the passing rates but also the average test scores in each of the six FITNESSGRAM tests improved dramatically after the SBSM curriculum (Table 3). Running a paired T-test, we found that the improvement in the FITNESSGRAM test was statistically significant ( $p < 0.05$ ) (Table 4).

Table 3. FitnessGram Average Test Scores and Percentage Change for RFK Community Schools Students before and after the SBSM Curriculum

Test	Pre-SBSM	Post-SBSM	Percentage Change
Pacer	39.2	47.2	20.4%
Curl-Ups	40.2	58.3	45%
Trunk-Lift	10.3	11.9	15%
Push-Ups	7.0	11.4	62.8%
Sit-and-Reach	9.2	11.1	20.6%

Table 4. Location Measures for the Distribution of Passed Tests before and after SBSM

Pretest					
Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
1.000	2.000	3.000	3.074	4.000	6.000
Posttest					
Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
2.000	3.000	4.000	4.296	5.000	6.000
Difference in Test Scores (Post Test Scores - Pre Test Scores)					
Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
-1.000	0.000	1.000	1.222	2.000	4.000

During the first testing, the student score averages were significantly below the California State and LAUSD averages for seventh and ninth graders. However, after the completion of the SBSM curriculum, 60.7% of participating seventh-graders and 61.2% of participating ninth-graders at the five schools passed the FITNESSGRAM test, and these numbers compared favorably to the State and LAUSD statistics, as 55% of seventh-graders and 59.4% of ninth-graders statewide, and 43.8% of seventh-graders and 48.5% of ninth-graders District-wide had passed the test (Table 5). As can be seen in Table 6, after the completion of the SBSM curriculum the participating students (Study Group) had a better success in passing the FITNESSGRAM test than the control groups of 7<sup>th</sup> and 9<sup>th</sup> graders from the 5 schools. Thus, 60.9% of participating students from these two grades passed the FITNESSGRAM, while the passing rates of the control groups ranged from 34.9% to 47.6%.

Looking at each of the six tests separately, participating students during the first FITNESSGRAM testing had lower passing rates than the State and LAUSD averages for five of the six tests. During the second FITNESSGRAM testing (after the completion of the SBSM curriculum), students had higher passing rates than the State and LAUSD averages in four tests.

Table 5. Percentage of Students Passing FitnessGram Tests: CA State, LAUSD, and Study Group Comparisons

# of Tests passed	All Students (Boys and Girls)							
	7 <sup>th</sup> Grade				9 <sup>th</sup> Grade			
	CA	LAUSD	Study Group Pre-SBSM	Study Group Post-SBSM	CA	LAUSD	Study Group Pre-SBSM	Study Group Post-SBSM
5+	55.0%	43.8%	15.5%	60.7%	59.4%	48.5%	20.4%	61.2%
6	31.9%	22.7%	3.6%	32.1%	36.5%	28.0%	8.6%	27.6%
5	23.1%	21.1%	11.9%	28.6%	22.9%	20.5%	11.8%	33.6%
4	19.3%	21.0%	23.8%	23.8%	19.1%	22.5%	23.7%	26.3%
3	13.7%	17.0%	32.1%	14.3%	12.0%	14.8%	29.6%	9.2%
2	7.9%	11.5%	23.8%	1.2%	6.0%	8.2%	17.1%	2.6%
1	3.2%	5.2%	4.8%	0.0%	2.5%	4.2%	9.2%	0.7%
0	0.8%	1.4%	0.0%	0.0%	1.0%	1.8%	0.0%	0.0%

**4. Discussion**

Different measures point to the effectiveness of this intervention. For one, the eight P.E. teachers reported witnessing higher participation rates among students than in other P.E. curriculums they have taught. They attributed this to the hands-on nature and variety of activities (because of the rotations), and the fact that all students were involved in one activity or another at the same time, and they did not have to wait in line to get engaged in an activity. Teachers also commented that they have noticed a boost in the confidence levels of many students about P.E. and exercise after the completion of the curriculum.

While parents were overwhelmingly positive about the value of exercise, the vast majority of them did not exercise with their families, and only a small minority exercised regularly themselves. While the shifts in parental perceptions from one survey to the other were not statistically significant, a number of perceptual changes among students were found to be statistically significant. Thus, after the completion of the SBSM curriculum, a statistically significant higher number of students reported enjoying P.E. a lot, participating comfortably in every activity, knowing a lot about fitness, and feeling comfortable about exercise.

While the aforementioned changes occurred across genders, some gender differences were also noted. In both surveys, significantly higher numbers of boys reported being active outside the school than girls. On average, girls reported enjoying P.E. less than boys, exercising less, and feeling less confident in their ability to exercise.

Evidence of the curriculum effectiveness was also shown in the performance of students during the FITNESSGRAM tests. Only 78 (50 boys and 28 girls) of the 389 students for which we had pair FITNESSGRAM tests before and after the SBSM curriculum had passed the test prior to the initiation of the curriculum. This number increased to 232 students (125 boys and 107 girls) after the completion of the curriculum. Statistically significant improvements were noted for five FITNESSGRAM tests (Pacer, Curl-Ups, Push-Ups, Sit-and-Reach, Trunk Lift), while the change in the student BMI was not significant. This can be expected since the BMI is also affected by other important factors such as nutrition and genetics. For girls, the greatest changes in passing rates were in the Pacer (49.7% improvement) and Sit-and-Reach (32.8% improvement) tests. For boys, the greatest changes were in the Pacer (41.8% improvement) and Push-Ups (29.6% improvement) tests. Significant changes for both boys and girls were also noted in the average performance scores for each of the five tests. Both male and female students showed the greatest improvement in the performance of push-ups (girls average: 4.1 before, 7.7 after; boys average: 9.9 before, 15.2 after). Despite the great improvement in the performance of Push-Ups, this test had the lowest passing rate of all tests. However, less than a quarter (23.1%) of students had passed the Push-Ups test prior to SBSM, while more than half (51.9%) did so after the SBSM.

Table 6. Percentage of Students Passing FitnessGram Tests: Study and Control Groups

# of Tests passed	7 <sup>th</sup> and 9 <sup>th</sup> Grade Students (Boys and Girls)					
	Study Group Post-SBSM (N=228)	New Open World Academy (N=235)	LA High School of the Arts (N=115)	UCLA Community School (N=240)	School for the Visual Arts and Humanities (N=105)	Ambassador School of Global Leadership (N=241)
5+	60.9%	34.9%	38.3%	39.6%	47.6%	41.9%
6	29.6%	17.4%	21.7%	20.0%	21.9%	19.1%
5	31.1%	17.4%	16.5%	19.6%	25.7%	22.8%
4	25.0%	20.4%	23.5%	19.2%	25.7%	19.1%
3	11.75%	27.2%	18.3%	12.9%	16.2%	19.9%
2	1.9%	12.8%	5.2%	10.8%	6.7%	3.7%
1	0.4%	0.4%	0.0%	3.8%	1.9%	1.2%
0	0.0%	4.3%	14.8%	13.8%	1.9%	14.1%

Since this was not a longitudinal study but only involved a pretest/posttest evaluation by taking measurements only at two specific points in time, we have no way of determining if the positive impacts observed after the completion of the SBSM curriculum would have a lasting effect for the participating students. Nevertheless, the SBSM curriculum implementation at the five LAUSD inner-city schools showed some promising results. In addition to notable increases in student performance of different physical activities, improvement was also observed in student confidence levels and overall outlook towards fitness and exercise. Further research is necessary to examine the impact of the SBSM curriculum on students in more schools, examining possible differential impacts among students of various age, race/ethnic, and socio-economic backgrounds, and using control groups and longitudinal studies to examine long-term impacts.

## 5. Conclusion

Obesity rates are high among inner city youth and can only be lowered through a systematic and persistent combination of healthy nutrition and active life styles. Schools have a critical role to play in the fight against youth obesity, because for many inner city youth, P.E. classes represent the only consistent venue for physical activity. Unfortunately, many inner city schools are challenged by diminishing budgets, lack of appropriate P.E. space, facilities, and equipment. Additionally, P.E. teachers often encounter low confidence levels among obese or overweight youth. Lack of confidence and feelings of intimidation towards physical activity are aggravated by the repeated failure of some students to pass the FITNESSGRAM or other equivalent fitness tests. Additionally, P.E. teachers and school health officials may still have to fight socio-cultural beliefs that deem sports and exercise as more appropriate for boys than girls. Parental support of an active life style is important, but as we observed in our survey, very few inner-city parents exercise regularly with their families.

As some teachers mentioned in the posttest interviews, the SBSM curriculum focused simultaneously on both the mind and the body of students. Teachers were trained to be very supportive of student efforts, going over the rotations with the students, explaining what types of exercises they were doing and why, as well as the benefits of each exercise. Additionally, teachers were encouraged to place special emphasis on praising individual improvement instead of making comparisons with other students. Thus, it is very important that P.E. teachers are trained on how to encourage



supporting behavior and cultivate confidence levels among their students. This took place at the five schools, and teachers were additionally given a handbook with detailed descriptions of procedures, exercises, and activities.

The study also indicates that particular attention has to be given to female students who, as the study found, often appear to be less motivated to perform physical activities out of shyness, lack of confidence in their capabilities, or because they are influenced by cultural norms. Possibly, P.E. teachers may experiment with separating at times boys from girls in the rotations.

By keeping students engaged with different “stations” and different rotations, the challenge of large class sizes is addressed to some extent, since students do not have to wait for their turn. Still, P.E. teachers should consider how to best adjust the number of activity stations, the time spent on each station, and the number of students in each, to account for size differences in their classes.

An aspiration of the SBSM curriculum is that it can motivate youth to also instill life habits and exercise on their own with a variety of easily accessible and affordable equipment. Because of the short timeframe of this evaluation, it was impossible to inquire about any acquired long-term habits. However, the curriculum’s 8-week timeframe may be too short for inducing significant behavioral changes among students, and repeated modules of the curriculum should appear throughout the full academic year. Additionally, as indicated by some teachers, it may make sense to offer the curriculum slightly less times per week but with longer-lasting sessions. As with every curriculum, periodic and comprehensive evaluations followed by adjustments and modifications should accompany the application of the SBSM curriculum in schools.

Ancient Greeks were the first to note the interrelationship between healthy minds and healthy bodies. The schools are in a unique position to help the fight against adolescent obesity. To do so, they may have to adopt P.E. curricula that target not only the bodies but also the minds of their students, building confidence, self-esteem, as well as physical ability. The promising results of this intervention imply that it may be a right step towards this direction.

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