Final Obesity Prevention Initiative (OPI) Evaluation Report

Prepared for

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Background:
School physical education (PE) and recess are important sources for promoting physical activity and helping to control for obesity among children. PE teaches important knowledge, movement, and social skills, and provides opportunities for children to participate in physical activity that is needed for immediate and long-term physical fitness and health benefits. Recess and lunch periods provide additional opportunities for children to be physically active and to practice their movement skills during structured and non-structured leisure time.

During spring 2004 we conducted systematic observations directly in these environments to assess children's physical activity levels and associated variables. These assessments were in addition to the feedback that participants, primarily teachers, provided about the staff development and value of the programs after each inservice they attended.

Methods
Eight San Diego City Schools were identified to participate in the more extensive evaluation. Of these, four schools (Perry, Linda Vista, Emerson-Bandini, and Chavez) were identified as SPARK intervention-only schools and the other four (Lindberg-Schweitzer, Encanto, Lee, and Sandburg) were provided both the SPARK and Peaceful Playground programs. All schools received the nutrition and smoking prevention component.

This evaluation component was delayed, and began only midway through the OPI project. Funds were originally allocated to evaluate this component with the understanding that it would start with the overall OPI, which began with beginning of the 2003-2004 school year. Unfortunately, funds for the evaluation components were not forthcoming on schedule. It was not until after the school year began (October/November 2003) that we found out funding would again become available to evaluate this component. The timeline is presented in Appendix 1.

<u>Data Collection Measures</u>
Ten data collectors were recruited and hired, and they participated in a two-day intensive program training during November/December 2004. Recruitment of the eight schools, however, was delayed and data collection did not begin until January 2005. Because of this, approximately half the trained observers took other jobs and were not able to take part in actual data collection. Nonetheless, the remaining trained data collectors were able to complete observations for a total of four days at each school during both baseline and post data collections. The following data collection measures were used.

SOFIT (System for Observing Fitness Instruction time): SOFIT is a research-validated measure that provides data on lesson context and student activity levels during physical education classes. For a true picture of the conduct of PE in schools it is important to sample often and systematically. SOFIT variables (and any observations in PE) are affected by a number of factors, including those in identified in Appendix 2.

We collected data on student physical activity engagement and lesson context/content during 153 physical education classes. Student activity level was recorded as 1) lying, 2) sitting, 3) standing, 4) walking, and 5) very active. Lesson context/content refers to how physical education subject matter is delivered, and was recorded as 1) management, 2) knowledge content, 3) fitness, 4) skill practice, 5) game play, and 6) other/free play.

Session/lesson Quality Assessments: At the end of a SOFIT lesson, observers also completed a rating scale to identify important lesson characteristics relative to content and instruction.

SOPLAY (System for Observing Play and Leisure Activity in Youth): SOPLAY is a research-validated instrument that provides data in general play/activity areas during leisure time periods. It is complimentary to SOFIT, and shows how children are active, at what levels, and what they are doing beyond structured PE classes.

We completed SOPLAY observations during recess and lunch periods at 6 schools. Separate scans were made for boys and girls, and the activity of each person was recorded as 1) sedentary, 2) walking, or 3) very active. The most prominent physical activity in which boys and girls were participating was also recorded. Additionally, the target areas (i.e., play environment) were simultaneously coded for 1) area accessibility, 2) area usability, 3) presence of supervision, 4) presence and classification of organized activity, and 5) equipment availability.

Results and Discussion

SOFIT MEASURES.

A total of 163 physical education lessons were observed; 90 during Measure 1 and 63 during Measure 2 (see Table 1). Each school was observed for four days at both time periods. Eight schools were recruited to take part in this evaluation component, but one dropped out of the OPI project, leaving only seven (N=7).

At the end of an observed lesson, assessors asked teachers whether they had participated in a SPARK workshop and whether the lesson they just taught had been taken directly from a SPARK text. At Measure 1, no teachers indicated they had previously participated in a SPARK training. At Measure 2, 79% of the observed lessons were taught by teachers who had some SPARK training. Thus, not all teachers at a school completed the SPARK workshops.

Teachers reported that two percent of observed lessons were taken directly from SPARK texts at Measure 1; that figure increased to 24% at Measure 2. Because Measure 2 often

occurred within a week of staff development, the data suggest that teachers adopted SPARK materials quickly. No data were collected to assess whether SPARK materials formed only PART of lessons.

Most of the tables show values for Measure 1 and Measure 2. It is important, however, to note that valid comparisons of lessons during Measures 1 and 2 are not possible in this project. It was not possible to control for many variables that may affect SOFIT outcomes (e.g., seasonality, weather, unit of activities—see Appendix) or to ensure that the same teachers and grade levels were observed during the two measures.

Table 1. Number PE Lessons Observed at Seven Schools.

School	Measure 1	Measure 2
Linda Vista	17	9
Perry	14	4
Lee*	12	9
Sandburg*	9	8
Emerson-Bandini	9	16
Encanto*	15	12
Lindberg-Schweitzer*	14	5
Total	90	63

PE lesson length was controlled by the master schedule at individual schools, and it remained similar during Measure 1 and Measure 2 (see Table 2). The average lesson length of 38 minutes is longer than those observed in most other elementary schools, and it reflects the allocation of time that PE specialists were provided to accommodate teachers' "Prep time" allocation. Data provided by teachers were inconclusive about whether there was an increase in the frequency of PE lessons, an event noted with classroom teachers trained in previous SPARK programs.

Table 2. Observed length of PE lessons in Seven Schools.

School	**Mean Length of Lessons** (minutes)	
	Pre	Post
Linda Vista	36	42
Perry	50	49
Lee*	52	53
Sandburg*	27	31
Emerson-Bandini	38	33
Encanto*	22	22
Lindberg-Schweitzer*	40	35
Total	38	38

Students were engaged in moderate to vigorous physical activity during 53% of class time at both Measure 1 and Measure 2 (See Table 3). This proportion of time is high, and exceeds baseline measures for several programs (e.g., 37% in the CATCH and NICHD studies), and surpasses the 50% recommended by Healthy People 2000 and 2010. Teachers in these schools are to be commended, because rarely has MVPA been found to be above 50% in any study.

Table 3. Proportion of lesson time students spent in moderate to vigorous physical activity (MVPA).

	Measure 1			**Measure 2**		
School	Mean lesson minutes observed per day	Mean minutes students in MVPA	% MVPA	Mean lesson minutes observed per day	Mean minutes students in MVPA	% MVPA
Linda Vista	148	75	51%	92	62	67%
Perry	160	73	46%	47	24	51%
Lee*	157	65	41%	110	56	51%
Sandburg*	60	37	62%	55	25	45%
Emerson-Bandini	89	44	49%	118	66	56%
Encanto*	71	46	65%	59	32	54%
Lindberg-Schweitzer*	135	74	55%	44	21	48%
Total	117	59	53	75	41	53

How teachers delivered PE content is shown in Tables 4 and 5, which indicate the proportion of class time spent in different lesson contexts for schools at Measure 1 (Table 4) and Measure 2 (Table 5). These results are similar to other SOFIT studies, and substantial differences were not evidenced between the two measurement periods.

Table 4. Proportion of class time in different lesson contexts at Measure 1(N=90 lessons)

	Measure 1 (Percentages)					
School	Management	Knowledge	Fitness	Skill Practice	Game Play	Other (free play)
Linda Vista	23	9	8	29	30	1
Perry	13	21	25	15	17	9
Lee*	22	19	18	12	29	0
Sandburg*	13	2	29	6	50	0
Emerson-Bandini	18	17	13	25	23	4
Encanto*	9	2	33	4	41	11
Lindberg-Schweitzer*	25	10	26	19	18	2

Total	17.6	11.4	21.7	15.7	29.7	3.9

Table 5. Proportion of class time in different lesson contexts at Measure 2 (N=63 lessons)

	Measure 2 (Percentages)					
School	Management	Knowledge	Fitness	Skill Practice	Game Play	Other (free play)
Linda Vista	15	4	21	0	45	15
Perry	36	22	20	14	7	1
Lee*	22	3	14	3	52	6
Sandburg*	20	24	8	28	20	0
Emerson-Bandini	28	8	20	20	17	7
Encanto*	15	6	26	23	29	1
Lindberg-Schweitzer*	33	16	21	2	28	0
Total	24.1	11.9	18.5	12.9	28.3	4.3

Session/lesson Quality Assessments:

At the end of a SOFIT lesson, observers also completed a rating scale to identify important lesson characteristics relative to content and instruction. Table 6 shows that the majority of lessons included a warm-up period. This is an important factor relative to safety, particularly for older children. Warm-ups are often built into the lesson with younger children.

Table 6. Percentage of observed lessons with warm-ups included.

	Measure 1	Measure 2
Linda Vista	71	89
Perry	93	75
Lee*	75	56
Sandburg*	44	63
Emerson-Bandini	100	81
Encanto*	33	8
Lindbergh-Schweitzer*	100	20
Total	73.7%	56%

A cool-down period after a vigorous lesson is important for children because it prepares them to return to the classroom. Table 7 shows that the teachers need to focus more on including cool down periods into their lessons. This concept was not emphasized during SPARK workshops.

Table 7. Percentage of observed lessons with a cool-down period.

School	Measure 1	Measure 2
Linda Vista	35	0
Perry	7	50
Lee*	25	0
Sandburg*	0	0
Emerson-Bandini	0	13
Encanto*	0	0
Lindbergh-Schweitzer*	71	20
Total	19.7%	11.8%

Children are more likely to be active both during PE and at other times if they enjoy their experiences. Table 8 indicates high scores for the observed classes, with children being judged as "enjoying themselves all or most of the time" in over 85% of the lessons.

Table 8. Proportion of lessons during which students were observed to be "enjoying themselves all or most of the time"

	Measure 1	**Measure 2**
Linda Vista	94	78
Perry	93	75
Lee*	100	100
Sandburg*	100	100
Emerson-Bandini	78	69
Encanto*	80	92
Lindbergh-Schweitzer*	100	20
Total %	92.1%	76.3%

Children in the classes may have had high MVPA levels because their teachers frequently encouraged them to be physically active. For example, about 80% of total lessons were judged as having "encouraged/reinforced children to be physically active all or most of the time." (See Table 9.)

Table 9. Proportion of lessons during which students were observed to be "encouraged/reinforced to be physically active all or most of the time"

	Measure 1	**Measure 2**
Linda Vista	76	67
Perry	100	100

Lee*	67	78
Sandburg*	100	67
Emerson-Bandini	100	75
Encanto*	40	67
Lindbergh-Schweitzer*	100	20
Total %	83%	68%

Table 10 shows that most classes (approximately 79%) had an adequate student:equipment ratio during all or most of the lesson. Table 11 shows that most lessons (approximately 75%) also had appropriate sized groupings all or most of the time. Lower ratings on these two variables during Measure 2 may have resulted from increased use of large group games that are often played in hot weather and late in the school year.

Table 10. Proportion of lessons observed to have "adequate student:equipment ratio all or most of the time."

Lesson had adequate student:equipment ratio	**Measure 1**	**Measure 2**
Linda Vista	94	100
Perry	100	75
Lee*	75	67
Sandburg*	89	75
Emerson-Bandini	100	69
Encanto*	23	42
Lindbergh-Schweitzer*	100	20
Total %	83%	64%

Table 11. Proportion of lessons observed to have "group sizes appropriate to activity all or most of the time"

Group sizes were appropriate to activity	**Measure 1**	**Measure 2**
Linda Vista	100	89
Perry	100	75
Lee*	83	56
Sandburg*	100	100
Emerson-Bandini	100	69
Encanto*	33	50
Lindberg-Schweitzer*	100	20
Total %	88%	66%

Table 12 shows that few classes focused on encouraging children to be active outside of class time. These data are consistent other studies in which this variable has been examined. Elementary school teachers typically focus on the 'here and now' of lessons. SPARK staff development sessions should begin to focus more on encouraging teachers

to think about promoting children to be physically active beyond the current lesson. (NOTE: Promoting physical activity beyond PE is the main focus of the SPARK Active Wellness Curricula.)

Table 12. Proportion of lessons observed in which students were "prompted/rewarded for out-of-class MVPA engagement all or most of the time."

Students were prompted/rewarded for out-of-class MVPA engagement	**Measure 1**	**Measure 2**
Linda Vista	7	0
Perry	2	3
Lee*	4	2
Sandburg*	1	5
Emerson-Bandini	3	0
Encanto*	0	0
Lindberg-Schweitzer*	13	0
Total %	33.3%	15.8%

SOPLAY Observations

It was possible to collect SOPLAY data in only six schools (3 SPARK-only and 3 SPARK + Peaceful Playgrounds). The results are shown by school and intervention cluster (SPARK-only and SPARK + Peaceful Playgrounds).

Table 13 shows the physical activity levels of children observed during recess and lunch periods were relatively high during both Measures 1 and 2. As expected because of differences in playground size and structure and the types of programs offered during leisure time periods, there was substantial variability among schools. Consistently with other studies, boys were substantially more active than girls.

Table 13. Proportion of boys and girls engaged in moderate to vigorous physical activity at lunch and recess during Measures 1 and 2. (N=1183 target area observations).

Playground (lunch and recess combined) MVPA Levels (%)				
	Girls		Boys	
	Measure 1	**Measure 2**	**Measure 1**	**Measure 2**
Linda Vista	61%	56%	70%	94%
Perry	44%	58%	57%	69%
Lee*	69%	70%	78%	73%
Sandburg*	76%	60%	79%	61%
Emerson-Bandini	43%	48%	55%	57%
Encanto*	46%	47%	59%	57%
SPARK only	49.3%	54%	60.6%	73.3%
SPARK + Peaceful Playgrounds	63.6%	59%	72%	63.6%

Table 14 summarizes the characteristics of the target areas in the six schools. Essentially, the playgrounds were accessible and usable all the time (observations were made only during clement weather). As well, schools provided supervision and equipment at high rates. On the other hand, they provided very few structured activities during leisure time periods (during only about 5% of Target Areas). By providing more structured activities during recess and lunch periods, schools might be able to both attract more students to play areas and increase their activity intensity.

Table 14. Characteristics of observed playground areas for six schools during at recess and lunch periods. (N=1183 total target area observations.)

		Accessible	Usable	Supervised	Organized PA	Equipment Provided
SPARK only	Measure 1 N=270	269 99.6%	270 100%	211 78.1%	22 8.1%	230 85.1%
	Measure 2 N=172	172 100%	172 100%	110 63.9%	13 7.5%	129 75%
SPARK + Peaceful Playgrounds	Measure 1 N=376	376 100%	368 97.8%	358 95.2%	4 1%	302 80.3%
	Measure 2 N=365	362 99.1%	365 100%	259 70.9%	23 6.3%	319 87.3%

Data in the above tables reflect the fact that there was little time for intervention components to be implemented. As well, Measure 2 took place during student testing and very near the end of the school year. In many cases, Measure 2 occurred only a day or two after the SPARK workshop.

Recommendations/Lessons Learned

It is important to realize that the project was designed as an intervention, not a research project. As with other projects, we learned many lessons.

The first lesson learned is the need to incorporate evaluation components from the start; not to add them after the school year has begun. It takes time to bring a school district on board and to make sure all parties involved are supportive of the evaluation project. Working with a smaller school district might allow project staff to become engaged directly with the schools involved, rather than dealing with them through several levels of administration. This would help in relaying important information and in scheduling of project components, including inservices/workshops and data collection.

Programs can only be assessed appropriately when there is time for intervention to be fully implemented and adopted by teachers. Having school personnel identify evaluation schools early would allow data collection to be scheduled well before and after the SPARK and Peaceful Playground workshops. It is also important to allow enough time in between data collection and intervention components in case rescheduling needs to occur.

At the same time schools are being identified, data collectors need to be recruited, hired, and trained. Training data collectors is a crucial part of the evaluation component, and they should be able to work the whole length of the project. In the current project, too much time elapsed after the data collector training, and several took other jobs before they could work on OPI. Fortunately, we trained enough data collectors so we could complete Measure 2.

The reduced time for the evaluation was also caused by delays early on. SPARK workshops #1 and #2 could not be scheduled early and at consistent time intervals. Post data collection was to occur after the two SPARK workshops and Peaceful Playgrounds training.

The Peaceful Playgrounds component was to occur at four schools. They received staff training and were given materials to paint markings on their playgrounds. However, because delays starting interventions, inconvenient time of year, and lack of personnel, playgrounds did not get painted before post data collection. Had the project and evaluation component started at the beginning of the year, schools would have been able to recruit parents and custodians to schedule a time to paint the playground after the baseline data collection occurred. It was our plan to have the schools paint playgrounds during the holiday break, however, schools were not identified in time to begin this process. In future projects it is recommended that grants include money to help the schools paint their playground, rather than having to rely on volunteers. See Appendix 3 for a recommended timeline.

Conclusions/Next Steps

The overall goal of OPI was to reduce the level of obesity in students by increasing the quantity and quality of physical education, physical activity, nutrition education, and smoking awareness. The full effects of OPI on these variables could not be captured in the current evaluation.

There are limitations to the data and the design of the evaluation, mainly because of the revised timeline. One of the eight schools withdrew completely from the OPI project because of a change in administrative personnel, and schools had not painted their playgrounds before the final data collection period.

The results of the evaluation, however, do indicate that many positive events are occurring in these schools. For example, children are engaged in high rates of MVPA during PE classes periods and they do enjoy their lessons. Additionally, teachers manage efficiently, select appropriately sized groups, provide sufficient equipment for children to learn, and they frequently encourage students to be active during class time.

As well, children engaged in high amounts of MVPA during recess and lunch periods. The school playground areas were observed to be highly accessible and usable and areas mostly are provided with substantial amounts of equipment and adult supervision.

APPENDICES

Appendix 1. Timeline and components of the current special evaluation component:

- Notification of funds to conduct additional evaluations of project---October/November, 2003
- School district to identify the 8 schools (4 SPARK only and 4 SPARK plus Peaceful Playgrounds)---November-February
- Recruitment of data collectors---October/November
- Training of data collectors---late November/December
- Initial plans for baseline observations---November/December
- After the baseline observations, we hoped schools would implement Peaceful Playgrounds (receive first round of SPARK trainings before the holidays and have school personnel paint playground sometime during the holiday break)
- Unfortunately, schools were not identified/recruited so baseline data collection, first round of SPARK trainings and Peaceful Playgrounds training were delayed until after the December holiday break
- Recruitment of the 8 schools continued through February
- First round of baseline observation/data collection ---January-February (Note: this first round of observations/data collection had to occur before the first SPARK training and before Peaceful Playgrounds training and the painting of playgrounds)
- First round of SPARK trainings occurred---January-May
- Peaceful Playgrounds trainings occurred---February/March
- Time restraints and scheduling of second round of SPARK trainings prevented the collection of process data
- Second SPARK trainings occurred---March-June
- Post observation/data collection---May-July

Appendix 2. Factors influencing SOFIT data.

Instructional goals[a]
-fitness, skill, knowledge, social/emotional development

Instructional content
-type of unit[b]
-lesson placement in unit[c]

Class characteristics
-size[d]
-diversity[e]

Environmental conditions
-size and location of instructional space[f]
-equipment and supplies[g]
-weather[h]

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[a] PE has many different goals; a single lesson might target a specific outcome and exclude others; outcomes change as teachers move through instructional units.
[b] Activities (e.g., sports) promote different activity levels (e.g., soccer=high MVPA; softball, track and field which are often held in the spring=low MVPA).
[c] Initial weeks of a unit typically have higher instruction and management time; the last weeks have more game play.
[d] Larger classes are associated with less MVPA and more management time.
[e] Having more objectives in a lesson are associated with increased instruction and management (transitions) time and reduced MVPA.
[f] MVPA is reduced in smaller spaces, including indoor classes. Because of inclement weather, outdoor lessons may be cancelled OR taken indoors impacting the MVPA of students already in indoor spaces.
[g] More equipment and supplies are associated with increased student opportunities to respond and MVPA.
[h] Very hot, humid, and cold weather inhibits MVPA.

Appendix 3. Recommended Timeline for New Intervention Projects

- Choose school district(s) that are supportive of the project and do not prohibit SPARK personnel from interfacing directly with the schools involved. This will eliminate planning and scheduling difficulties (May-July)
- Schedule SPARK workshops #1 and #2. Schedule Peaceful Playgrounds training in time to paint the playgrounds. Schedule baseline, process, and post observation data collection. (July/August)
- Recruit and train data collectors for SOFIT and SOPLAY (August)
- Collect baseline data at all schools (five observation days per school). (September/October)
- First SPARK staff development training workshop at all schools. (October/November)
- Present Peaceful Playgrounds. Include materials to have the schools paint the playground during the holiday break. (November/December)
- Collect process data at all schools (five observation days per school). (January/February)
- Second SPARK staff development training workshop at all schools. (February/March)
- Collect post training data at all schools. (March/April)

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