

# The Effects of Running Club Membership on Fourth Graders' Achievement of Connecticut State Standard for the Mile Run

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Physical education teachers strive to maintain and increase the physical fitness levels of their students and encounter serious challenges in this quest. Childhood obesity, sedentary lifestyles, administrative/systemic issues at school, decreases in physical education class time, and the high stakes testing movement's shifting of curricular emphasis toward academic programming while simultaneously limiting physical education and recess time present barriers to physical education teachers' efforts. Given obesity, inactivity, and decreasing physical education, intervention programs are needed.

According to the American Academy of Pediatrics (2003), 15.3% of 6 to 11 year-olds are at or above the 95th percentile for body mass index; indicating the presence of obesity and overweight status. Forty percent of schools have reportedly eliminated some recess time to concentrate on academics (Santa, 2007). Children may not be given the opportunities to play outside that they used to be given because of safety concerns, and they may not participate in after school recreational programs because of transportation issues, opportunities in the area, and cost (Morantz & Torrey, 2004). According to Taras (2005), the literature has not produced a body of evidence that regular physical activity detracts from academics. The National Association for Sport and Physical Education (NASPE, 2004), in its standards document includes attention to topics such as competence in physical activity, health enhancing physical

activity, and valuing physical activity for pleasure, health, and social interaction. According to the Center for Disease Control's School Health Policies and Programs national survey, 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provide daily physical education or its equivalent in the United States (CDC, 2006). Taken together these citations reflect that although we have physical education standards, physical education teachers may not be provided with time and resources to allow students to achieve them, even though physical activity does not detract from academics and is critically important for overcoming childhood obesity and developing lifelong patterns of physical health.

Physical activity is one of a number of factors that influence growth and development of children and adolescents. Regular physical activity is conducive to a healthy lifestyle and prevention of disease (Hills, King, & Armstrong, 2007), however children between the ages of 6 and 17 years old are getting slower in endurance running (American Heart Association, 2008). In Connecticut K-12 content standards for physical education include physical activity, human movement, fitness, responsible behavior, respect for differences, and benefits of physical activity (Connecticut State Board of Education, 2000). Connecticut physical education programs for students in grades four, six, eight, and ten directly assess cardiovascular endurance through the mile run. Connecticut has produced standard mile run

times for boys and girls of various ages. Designing curricula to meet these standards becomes yet another challenge for physical educators since the previously mentioned barriers may prevent or inhibit attainment of the state standards for many children. For example, given these barriers how do physical educators address the fitness content standard curricular outcome states that “Students will incorporate fitness and wellness concepts to achieve and maintain a health enhancing level of physical fitness” (Connecticut State Department of Education, 2006).

To maintain and enhance children’s activity and cardiovascular endurance levels, many schools have established running programs (Xiang, McBride, & Bruene, 2006). A study conducted by Xiang, McBride, and Bruene (2006) included 113 fourth grade students and examined the effects of motivation and performance while the students participated in a year long running program called Roadrunners. The program required students to run/walk once a week during their regularly scheduled daily physical education time. The students counted their laps during the year. The study revealed that although the students’ motivational levels decreased toward the end of the year long running program, performances in the mile run assessment improved (Xiang, McBride, & Bruene, 2006).

A similar study was done two years earlier on the same Roadrunners club with 116 fourth grade students (Xiang, McBride, & Bruene, 2004). The club was described as promoting cardiovascular endurance, physically active lifestyles, and behaviors such as persistence and effort. This particular study used the achievement goal theory as the basis, rather than motivation. The results indicated that persistence and effort positively correlated to the mile run times. It also showed an improvement over time in the mile run performances of the fourth grade students involved.

These studies reveal that 1) over time, increased physical activity can improve cardiovascular

endurance levels of children, and 2) providing opportunities to participate in regular, moderate to vigorous activities such as a running club are important to improve mile run times. The National Association for Sport and Physical Education (NASPE) recommends that children spend at least 60 minutes per day in physical activity (NASPE, 2008), yet the decreases in physical education class time is inconsistent with a) the NASPE recommendation, b) the need for practice to improve performance, and c) the negative effects of sedentary lifestyles. Given decreasing physical education time, challenges of obesity, and negative effects of inactivity, physical educators must design and implement intervention programs that efficiently and effectively address state and national standards for physical fitness such as the mile run.

The Connecticut Physical Fitness Assessment contains four components: curl-ups (muscular strength and endurance), push-ups (muscular strength and endurance), the sit and reach stretch (flexibility), and the mile run (cardiovascular endurance) that helped identify the priority for this study. For the mile run, the expectation for 8-year-old girls to meet the state standard is 11 min 15 sec, and for 8-year-old boys is 10 min 10 sec. The expectation for 9-year-old girls to meet the state standard is 11 min, and for 9-year-old boys is 9 min 45 sec. The purpose of this study was to investigate the effects of a running club on the mile run times of fourth grade students.

## Methodology

### *Participants*

The study was conducted in a suburban elementary school setting in central Connecticut with a student body of 400. The participants for the study included 59 fourth grade students, 30 of whom were boys and 29 of whom were girls. During the study, the participants ranged from 8 to 9 years old.

All of the students had twenty minutes of daily

recess and 40 minutes of physical education once every four school days, per the school schedule. Over the course of the 6-week study, all participants had eight physical education lessons in which they practiced running.

### *Procedure*

Given the Connecticut standards and previous experience in physical education, the researchers concentrated on the mile run time because: 1) most of the students run between 11 min and 13 min; 2) in the past three years, less than half of the fourth grade students completed the mile run in the required time; 3) one year ago 13 girls and 10 boys met the state standard out of 60 students; and 4) two years ago 6 girls and 8 boys met the state standard out of 61 students.

Before the study began, all of the fourth grade students participated in a pretest for the mile run. The pretest was administered on the same day for all of the fourth grade students. The pretest was administered one class at a time in the morning, and it did not involve the students' physical education class time. Each student's mile run pretest time was recorded on the data chart.

The fourth grade students were randomly divided into two groups by first putting a name of every student on the researcher's class lists into a bowl, second, drawing 30 names from the bowl for experimental group participation, and third, contacting these 30 students; all of whom expressed interest and agreement with joining the running club. The names remaining in the bowl comprised the control group. The students in the experimental group participated in a recess running club three days a week for a six week duration, whereas the students in the control group did not. The students in the experimental group provided verbal assent to be in the running club for the duration of the study because a) having a recess running club encompassed normal educational practice in the school setting, b) recess clubs involving moderate to vigorous activity levels took place in past years, and c) a university institutional review board approved this

procedure. All of the participants had 20 minutes of daily recess. Recess choices selected by the control group members on a daily basis included activities such as kickball, going on the swings, soccer, basketball free throw shooting, and playscape activities. The experimental group participated in these activities two days a week, and they took part in the running club the other three days to a) maintain motivation and b) prevent disinterest in running. Physical activity outside of school was not recorded.

The students in the running club were encouraged to run and/or walk at their own pace during the first week of the study. A combination existed, some participants ran the entire time, others combined jogging with walking, a few walked only. During the second week of the study, the students were encouraged to jog two laps without walking (5 laps = 1 mile). They continued the self-paced run/jog/walk pattern for the remainder of recess time. Each week, the students were encouraged to add a lap of continuous running so that during weeks five and six, more than half of the students were running a mile or more without walking. The students kept track of their laps during the study.

All fourth grade students had 40 min of physical education classes once every four school days because this structure was the current school schedule in place during the study. In addition to the running club, running practice occurred in the physical education classes. All of the fourth grade students participated in these running practices. The students started with a 3 minute run and during each subsequent physical education class, 1 minute and 30 seconds was added. By the sixth class, the students were running for 10 minutes and 30 seconds. The students also learned about the importance of pacing during the physical education classes. After the six weeks of the study concluded, all of the participants ran in the mile run posttest and the results were recorded on the data chart.

Table 1

*Group Averages of Pre and Post Mile Run Results*

<u>Test</u>	<u>Mean</u>		<u>Standard Deviation</u>	
	<u>Experimental</u>	<u>Control</u>	<u>Experimental</u>	<u>Control</u>
Pretest Mile	13.84	13.90	2.92	3.46
Posttest Mile	11.60	12.62	2.13	3.65

Table 2

*Group Statistics*

<u>Group</u>	<u>Mean</u>	<u>Std. Deviation</u>	<u>Std. Error</u>
Experimental	-2.24	1.52	0.28
Control	-1.29	1.72	0.32

**Results**

At pretest the experimental group and the control group average mile run time differed by 4 sec. At posttest the experimental group and the control group average mile run time differed by 59 sec. Data was converted from minutes and seconds to decimals for statistical analysis by dividing the total seconds of each time by 60. For example, a student who ran 13 min 30 sec mile would be represented by 13.50 in decimal format. Table 1 presents the average mile run pretest and posttest times (decimal format) of the students in the experimental group and the students in the control group.

The results of the mile run pre and post test times were entered into SPSS version 15. Results of the mile run pre and post test times revealed a mean of -2.24 for the experimental group, and a mean of -1.29 for the control group. The mean difference scores are negative which indicates that the average mile run times of both groups were higher at the pre-test. The decrease is significantly greater for the experimental group. Table 2 represents the group statistics of the mile run pre and posttest times.

An Independent Samples t-test was conducted using the software. The test was computed using the Post and Pre test differences score and the group affiliation (experimental vs. control). The

Table 3

*Results of the Independent Samples T-Test*

	T	Df	Sig (2-tailed)
Equal variances assumed	-2.25	57	.028
Equal variances not assumed	-2.25	55.67	.028

Table 4

*Students Meeting Connecticut Physical Fitness Mile Run Assessment Standard*

Group	Boys		Girls	
	Pretest	Posttest	Pretest	Posttest
Experimental	1	2	4	7
Control	5	7	2	4

results indicated a t-test value of  $-2.25$  which is statistically significant at the 0.028 level. This means that we have confidence that the experimental group performed statistically differently from the pre to post mile run test when compared to the control group. Table 3 displays the t-test results.

There were 59 participants in the study; 30 in the experimental group and 29 in control. Overall, 29 of the 30 experimental group participants improved their mile run time, and 24 of 29 control participants improved their time. As a group, the 30 experimental participants averaged an improvement of 2 min and 14 sec, and as a group, the 29 control participants averaged an improvement of 1 min 31 sec.

The following results reflect percentages of the 59 participants who met and did not meet standards. At pretest the mile run times revealed that 12, or 20%, of the 59 fourth grade students met the state standard expectations in accordance with the Connecticut Physical Fitness Assessment. Five of these 12 students meeting standard were in the experimental group and seven of them were in the control group. At posttest the mile run times indicated that 20, or 33.8%, of the 59 fourth grade students met the Connecticut Physical Fitness Assessment standards which was an increase of eight students, pre to post. Of the 20 students at goal at posttest, 9 were in the experimental group and 11 of them were in the control group. After the mile run pretest, 17% of the students in the

experimental group met the state standard, and 24% of the students in the control group met the expectation. After the six-week study, 30% of the students in the experimental group met the state standard, and 38% of the students in the control group met the expectation. Each group had 4 additional students that achieved the state standard expectations from pre to posttest. While 53, or 89.8%, out of 59 students in the study improved their mile run time, it was interesting to note that 66% of all students in the study did not reach the Connecticut Physical Fitness Assessment standard mile run time. See Table 4.

The overall findings of the study showed an improvement in both groups with the mile run times with the experimental group significantly outperforming the control group. Upon further inspection, the data revealed that two-thirds of the participants were unable to meet state standards for the mile run times.

### **Discussion**

The overall findings of this study suggest that one day a week of running practice improved the mile run times of fourth graders in the control group, but that four days a week of running practice results in more significant improvement for the experimental group members. While it is not surprising that more running improves running times, the results do raise some interesting principles and practice issues. The results suggest that six weeks of running club practice during recess, in addition to running in physical education class, is insufficient for the majority of students to achieve state standards. A future study could investigate the effects of a longer intervention. The results of this study suggest we can significantly improve running times for those who run more when compared to those who run less. It also indicates that despite either a) running club, recess, and physical education class running practice or b) recess and physical education class practice we could not have more than 30% reach

the state standard.

The Presidential Physical Fitness Test, a national standardized fitness assessment, uses the 85th percentile as its benchmark for establishing a mile run standard time; for 8 year-old girls the mile run time standard is 10:02, for 8 year-old boys, 8:48. Despite infusing running into recess, with students motivated enough to provide consent to join a running club at recess over other available activities, in our study only 2 of 30 students ran sub 8:48 and 7 of 30 ran sub 10:02; this is experimental group only, boys and girls combined.

We attribute the lack of participants attaining standard to an insufficient amount of running practice. While physical education classes and recess were available to the control group, and physical education classes, recess, and running club were available to the experimental group, these levels of interventions assisted in 53 of 59 participants improving their mile run times, but were insufficiently, inefficiently, and/or ineffectively designed to meet the mile run standard.

Alfie Kohn (1999) wrote "You can tell a lot about a teacher's values and personality just by asking how he or she feels about giving grades." The results of this study raise questions about the value placed on physical education in this era of high stakes assessment. Focusing on standards that are not attainable by the majority suggests either a) revisiting the standards to include amounts of realistic improvements in mile run times given physical education training, or b) changing reporting mechanisms that allow improvements short of standards to be stated.

It is not enough to create standards. Interventions designed to meet those standards must be designed, implemented, and supported with resources such as time in the school schedule for physical education. We need to decide whether we truly value those physical education standards enough to make students' attainment a realistic possibility or whether participation in health

enhancing physical fitness activities that could be enjoyed across the lifespan is a more practical outcome.

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