



# Comprehensive School Physical Activity Programs: A Framework to Get Active!

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# Overview

- Part 1: What do effective comprehensive school physical activity programs (CSPAP), look like and why are they important?
- Part 2: If we implement a CSPAP, what are the probable benefits?
- Part 3: What evidence do we currently have that this is the right direction to go in?

## BOY



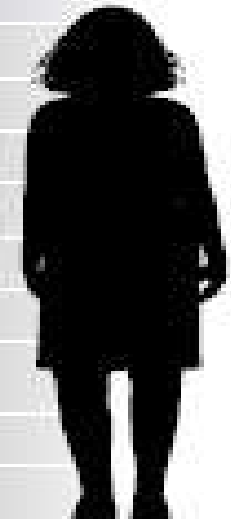
1981	BODY COMPOSITION	2007-2009
150.9 cm (4'11")	Height	155.8 cm (5'1")*
41.6 kg (92 pounds)	Weight	48.0 kg (106 pounds)*
18.1 kg/m <sup>2</sup>	Body mass index	19.2 kg/m <sup>2</sup> *
64.9 cm (25.6")	Waist circumference	66.2 cm (26.1")
78.0 cm (30.7")	Hip circumference	84.0 cm (33.1")*
0.83	Waist-to-hip ratio	0.82*
	FITNESS TESTS	
49 kg	Grip strength	44 kg*
26.5 cm	Sit-and-reach	21.4 cm*




## GIRL



1981	BODY COMPOSITION	2007-2009
153.1 cm (5'0")	Height	155.9 cm (5'1")*
42.7 kg (94 pounds)	Weight	47.6 kg (105 pounds)*
18.4 kg/m <sup>2</sup>	Body mass index	19.5 kg/m <sup>2</sup> *
62.4 cm (24.6")	Waist circumference	68.0 cm (26.8")*
81.2 cm (32.0")	Hip circumference	86.0 cm (33.9")*
0.76	Waist-to-hip ratio	0.79*
	FITNESS TESTS	
43 kg	Grip strength	40 kg*
32.0 cm	Sit-and-reach	28.2 cm*





# Physical Activity Guidelines for Americans (2008)

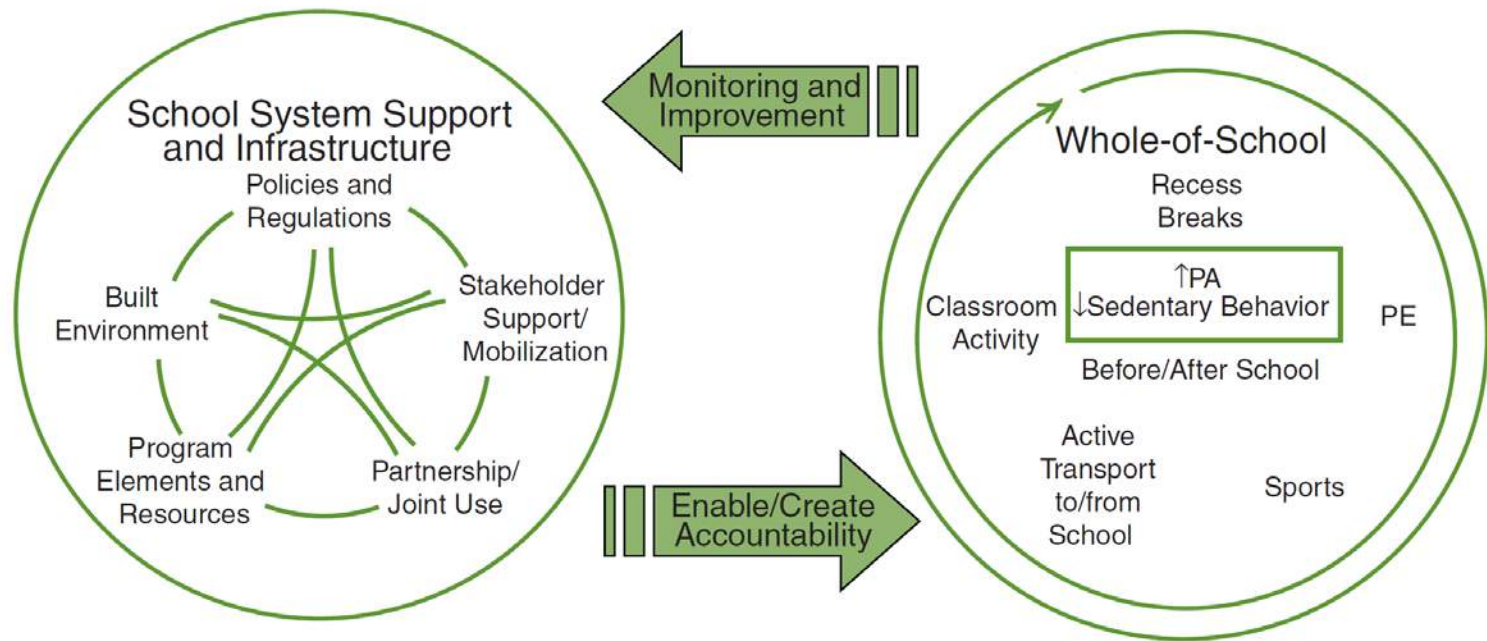
- Children and adolescents should participate in 60 minutes or more of physical activity each day
  - Aerobic (MVPA)
  - Muscle-strengthening
  - Bone-strengthening

# The School's Role in Public Health

- ***School Nutrition and Food Services***
  - Food and snacks available
- ***Comprehensive School Health Education (K-12)***
- ***Physical Education and Physical Activity***
  - Standards-based physical education
  - CSPAP

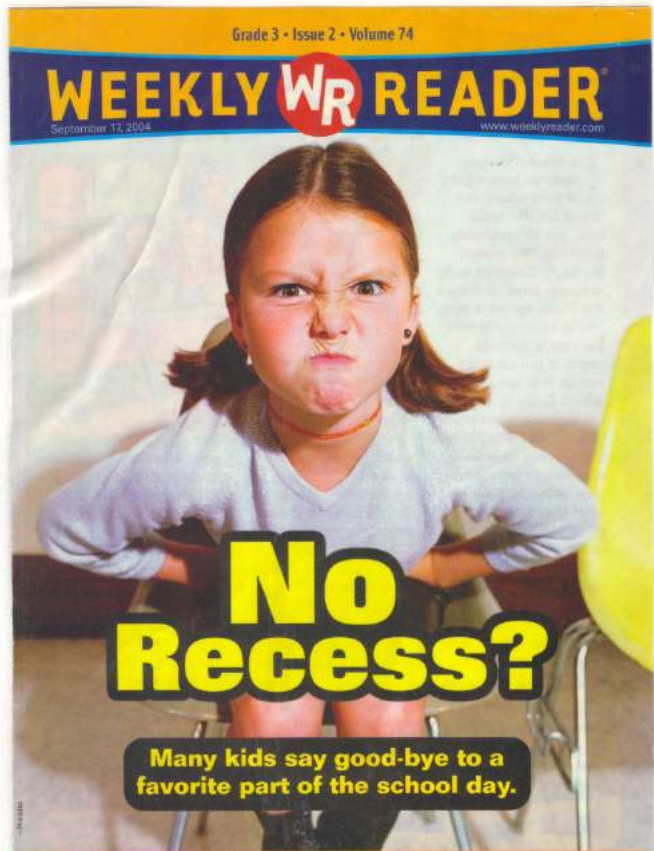
**Let's Active  
Move Schools**

# Recommendations from the IOM: Whole-of-School Approach

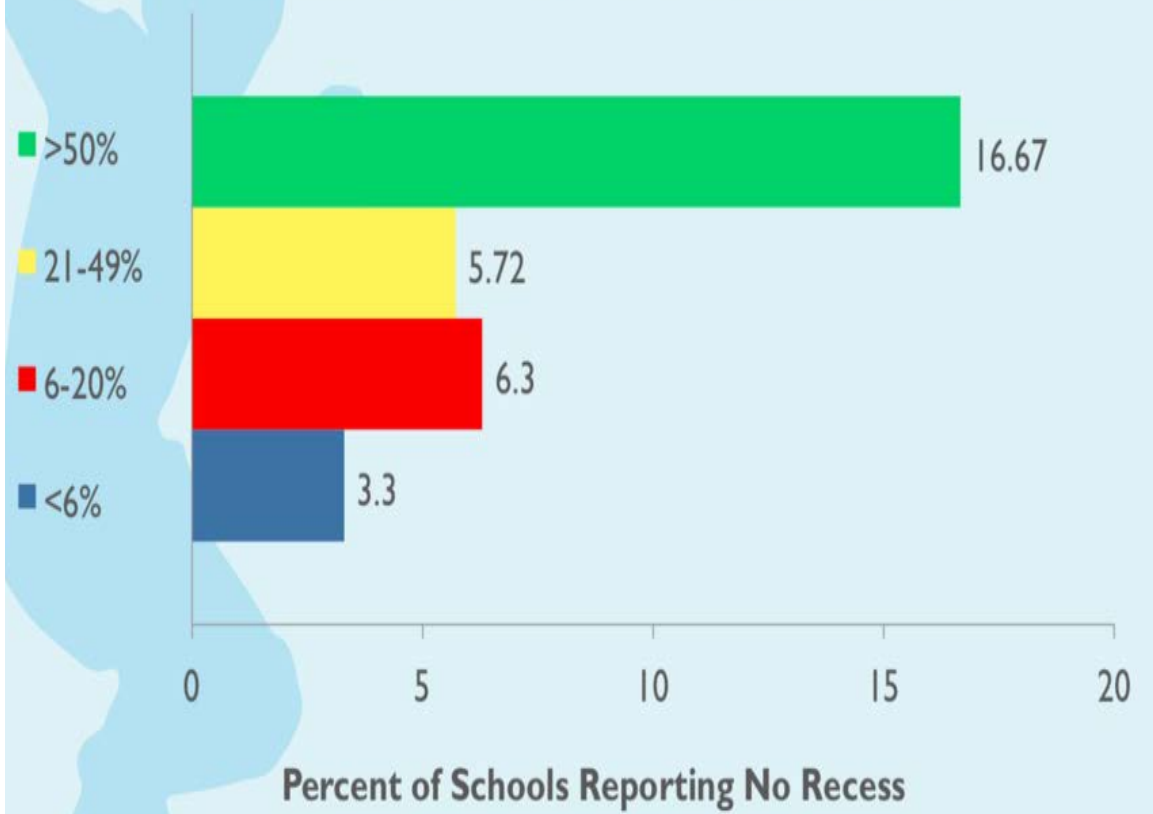


**FIGURE 1-2** Integrated/coordinated approach to increasing physical activity among children and adolescents in the school environment before, during, and after school.

NOTE: PA = physical activity; PE = physical education.



## Recess Offered by Minority Enrollment



Source of Data: NCES, Fast Response Survey System, 2005





Action for Healthy Kids



ASSESSMENT



ALLIANCE FOR A HEALTHIER GENERATION



PROFESSIONAL DEVELOPMENT

RECOGNITION

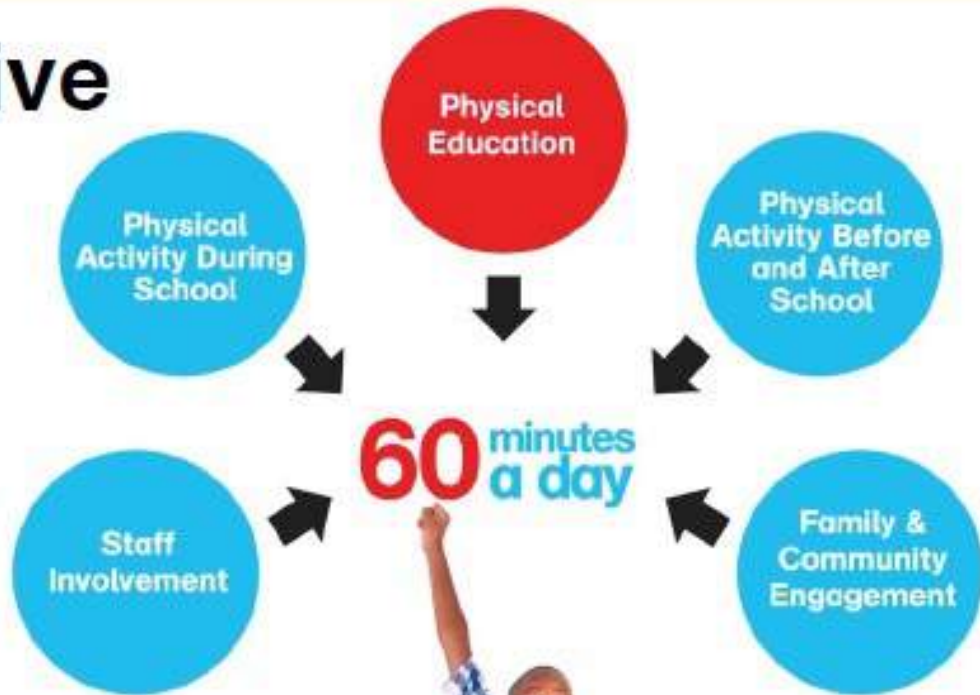


Let's Move Active Schools





# Comprehensive School Physical Activity Program



# Comprehensive School Physical Activity Program



# CSPAP *is* the Framework for Providing Physical Activity in Schools

Five key elements to achieve school-wide change:

1	2	3	4	5
Physical Education	Physical Activity During School	Physical Activity Before & After School	Staff Involvement	Family & Community

# CSPAP Implementation Means

Activity	Min/day offered	Min/day activity
Classroom breaks (3/day x 7 min ea.)	21	16
Physical education (60 min/ week)	12	6
Recess (one 15 min/day)	15	12
Recess (15 min before lunch)	15	12
Before school program/morning activity	10	8
<b>Total Physical Activity</b>	<b>73</b>	<b>54</b>

# What Constitutes an Effective CSPAP?

QPE as the focus

- Quality instruction
- Quality curriculum
- 50% MVPA
- Prepare children for life long physical
- Make purposeful connections to the community

# Implementing an Effective CSPAP

We (as AzAHPERD members) need to...

1. Champion physical activity
  - Train to become a Physical Activity Leader (PAL)
2. Understand why CSPAP is important
  - Quality of life
  - Health issues
  - Academic success
3. Have a vision of what programs could be
4. Integrate PA across the curriculum
5. Maximize PA during recess & drop ins

# Implementing an Effective CSPAP

We (as AzAHPERD members) need to...

6. Increase MVPA during physical education
7. Build partnerships
8. Understand joint use and programs after/before hours
9. Develop advocacy and marketing skills
  - Promote events
  - Effectively communicate our message
  - Develop targeted approaches for working with partners
  - Garner support
  - Develop and share strategies for overcome barriers
10. Passionately provide PA opportunities

# Concerns About CSPAP

Darla's Activity: Shake out our concerns



# Concerns Related to CSPAP

## *1. Physical education is not public health or physical activity*

**Health**: The condition of being of sound mind and body

**Health Behavior**: The actions of individuals or groups & organizations, as well as determinants, correlates, and consequences that bring about social change, policy, and coping skills, that improve the quality of life

**Physical activity**: Physical activity is any body movement that works your muscles and requires more energy than resting



# Counterpoint to PE vs. PA

## NASPE Physical Education Content Standards

Standard 1: Demonstrates competency in motor skills and movement patterns needed to perform a variety of **physical activities**.

Standard 2: Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of **physical activities**.

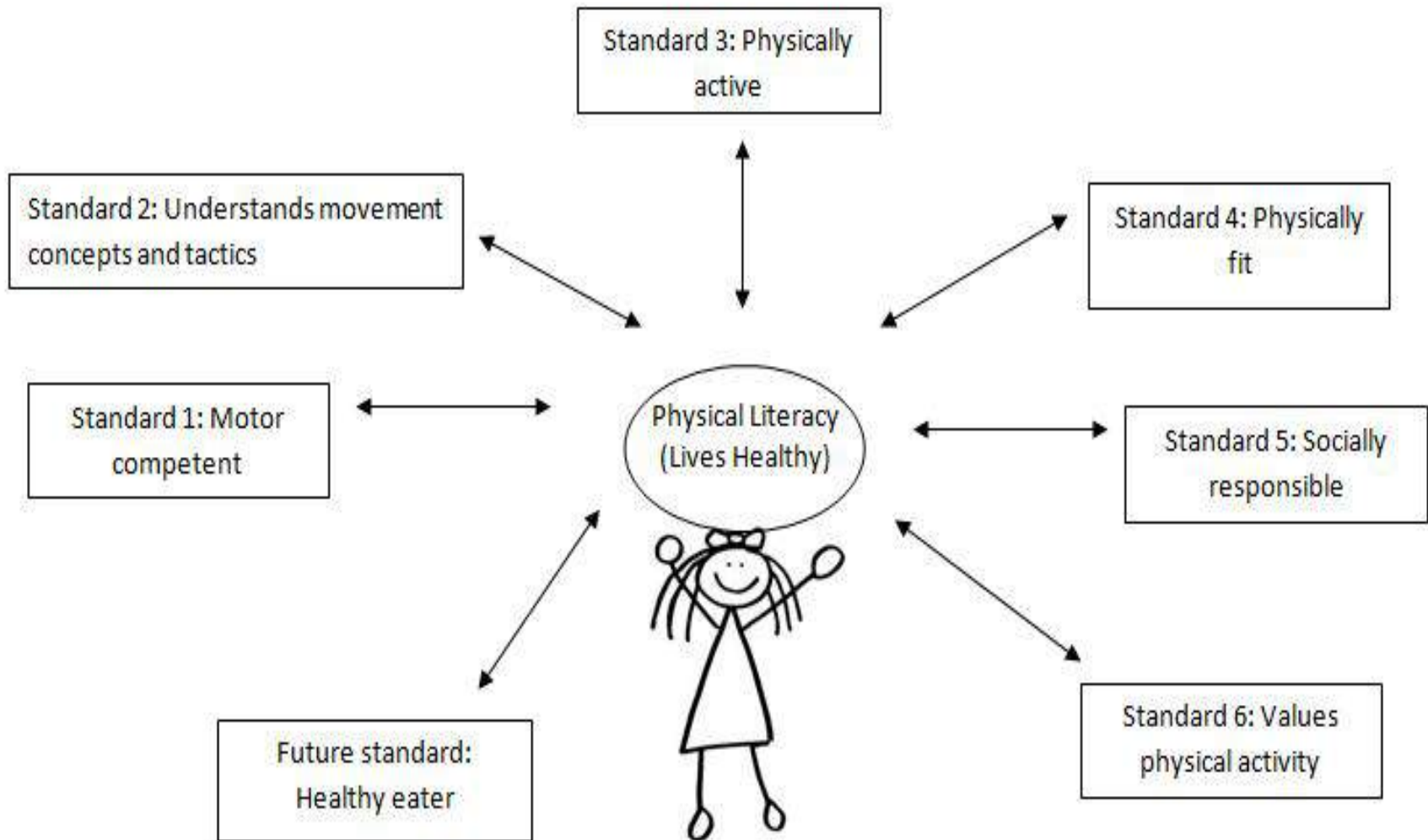
Standard 3: Participates regularly in **physical activity**.

Standard 4: Achieves and maintains a health-enhancing level of physical fitness [as a result of **physical activity** participation]

Standard 5: Exhibits responsible personal and social behavior that respects self and others in **physical activity** settings.

Standard 6: Values **physical activity** for health, enjoyment, challenge, self-expression, and/or social interaction.

# Physical Literacy



# Concerns Related to CSPAP

## *1. Physical education is not public health or physical activity*

- If we are not concerned about children's health then who will be?
- Every child should be healthy & happy

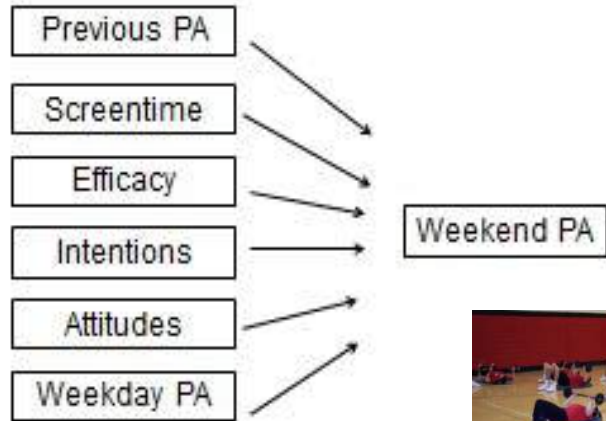
# Concerns Related to CSPAP

## 2. Physical education teachers are already overburdened

### Hypothesized Predictors:

Controlling for:

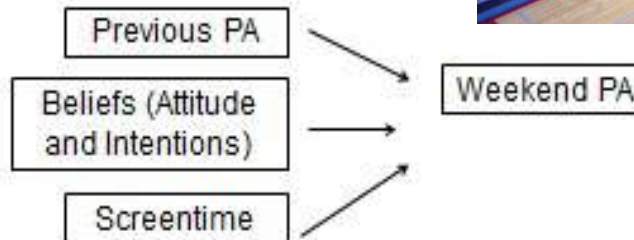
- Gender
- Age
- Ethnicity
- Free and Reduced Lunch
- Fitness



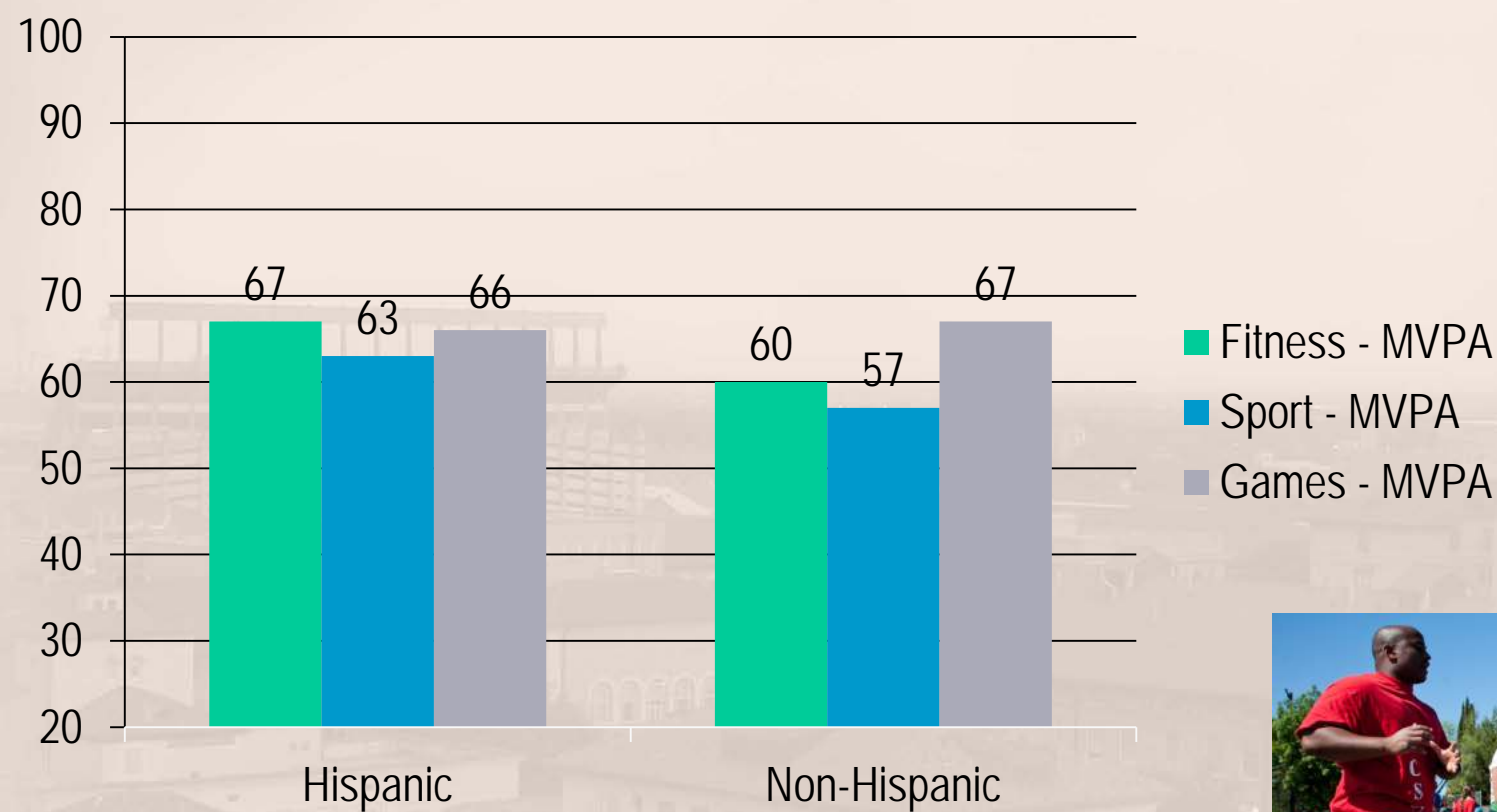
### Actual Predictors:

Controlling for:

- Gender
- Age
- Ethnicity
- Free and Reduced Lunch
- Fitness



# Culturally Relevant Pedagogy in Physical Education



Sanogo & Castelli, 2013



# Concerns Related to CSPAP

## *3. Embracing CSPAP is political suicide*

\*If we let anyone be a Physical Activity Leader then we will lose our jobs



- Investing in the health of children is cost savings
- Cost-effective equalizer that closes the achievement gap
- Can we afford not to have this be our political agenda?

## Part 2: If we implement a CSPAP, what are the probable benefits?

- There are a number of benefits to PA engagement
- There are a number of ways to provide PA opportunities
- There are a number of partnerships to build

Leslie's Activity: Numbers game



RESEARCH ARTICLE

# Healthier Students Are Better Learners: High-Quality, Strategically Planned, and Effectively Coordinated School Health Programs Must Be a Fundamental Mission of Schools to Help Close the Achievement Gap

CHARLES E. BASCH, PhD

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## ABSTRACT

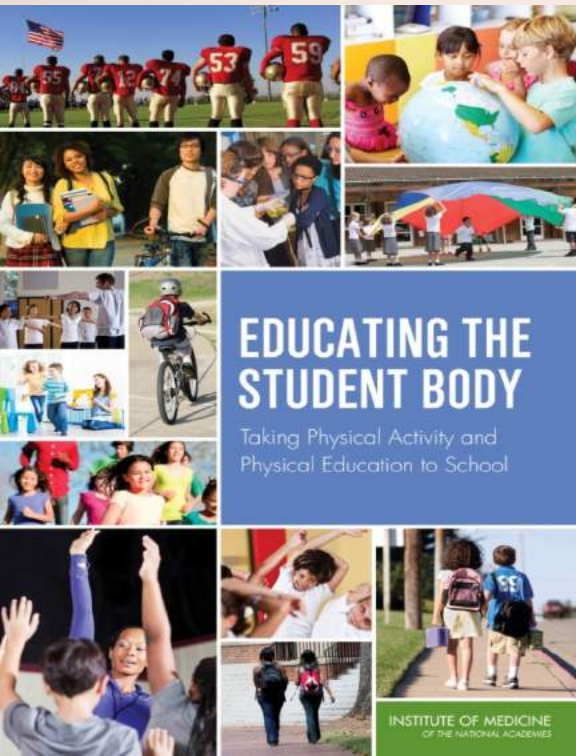
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**OBJECTIVE:** To discuss implications for educational policy and practice relevant to closing the achievement gap based on the literature review and synthesis presented in 7 articles of the October 2011 special issue of the *Journal of School Health*.

**METHODS:** Implications for closing the achievement gap are drawn from analyses of current literature.

**RESULTS:** During the past several decades, school reform efforts to close the achievement gap have focused on various strategies, yielding very limited progress. Educationally relevant health disparities influence students' motivation and ability to learn, but reducing these disparities has been largely overlooked as an element of an overall strategy for closing the achievement gap. If these health problems are not addressed, the educational benefits of other school reform efforts will be jeopardized.

# Benefits of Physical Activity and Physical Education



Physical Health


Mental Health

Psychosocial Health

Brain Health

Academic Performance





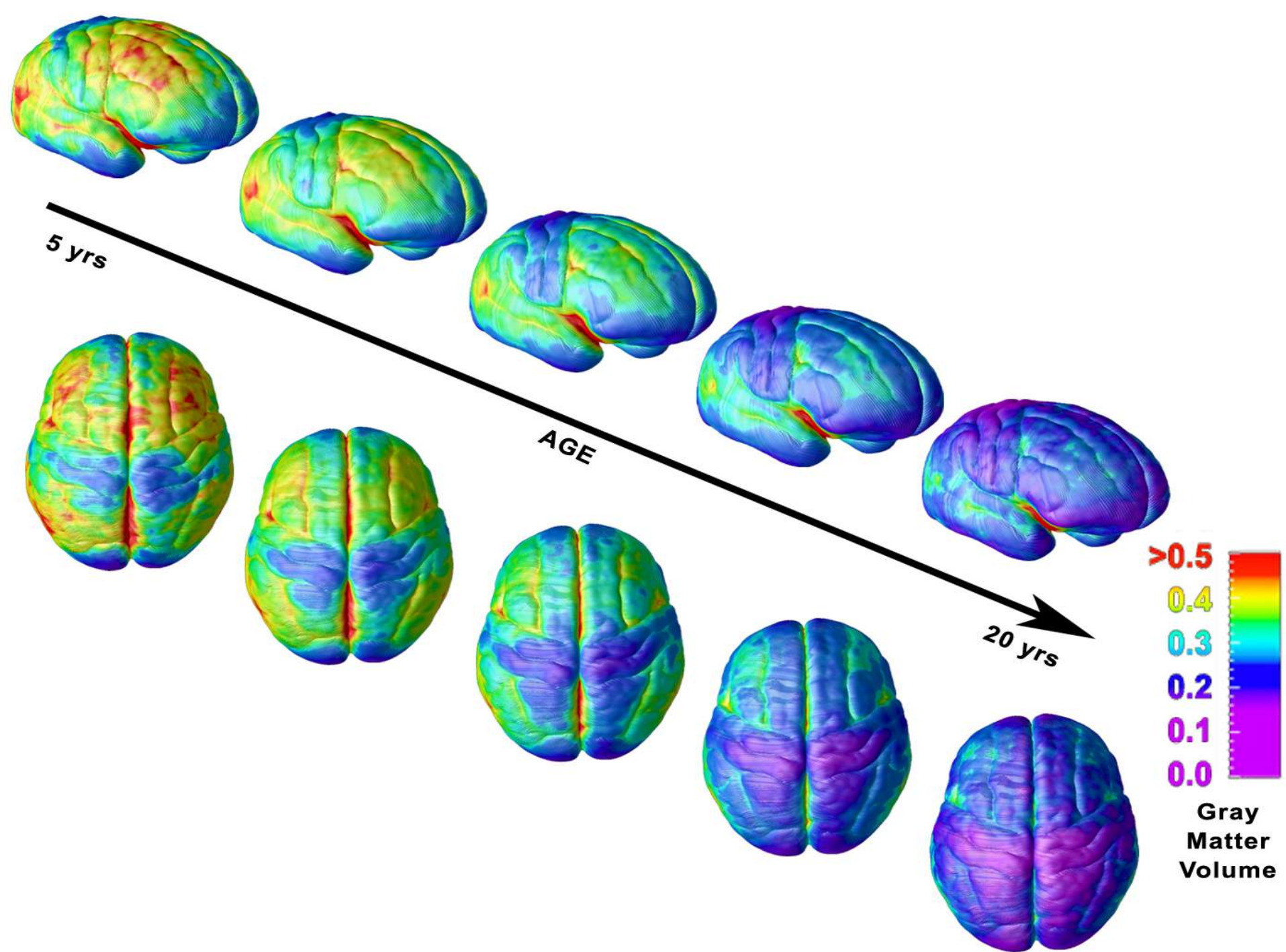
# Physical Activity & Academic Performance

If we get K-12 students to meet the NASPE physical education standards,

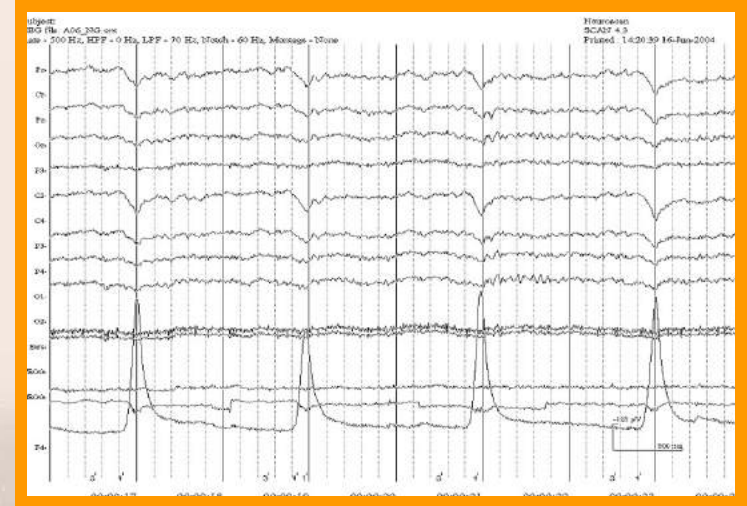
**Then Now** we can claim that participation in physical education and physical activity opportunities facilitate learning and enhance brain health.

# Cognitive & Brain Health

- Measurement of cognition varies by age:
  - **Standardized tests, grades, attendance, memory**
  - Observation: Attention, EEG, fMRI, Stroop
  - Self-report: Ability to carry out daily living tasks
  - Survey/interview: Having a sense of purpose
- Executive control (measured in the lab)
  - A subset of cognitive processes related to sequencing, discrimination, and inhibition
  - Inhibition, working memory, and cognitive flexibility

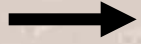


# Brain Event Related Potentials

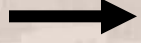


Stimulus

X



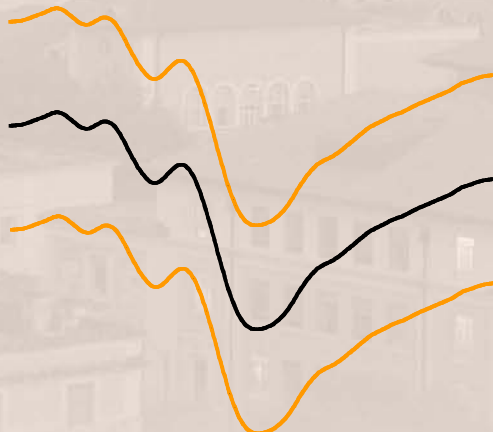
X



X



Response



# Measurement of Executive Control

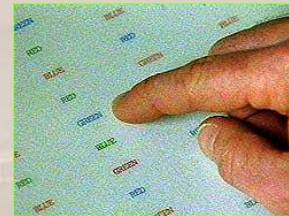
- Stimulus-response (i.e., Odd ball paradigm)
  - Press the button when you see the cat



- Discrimination tasks (i.e., Flanker's task)

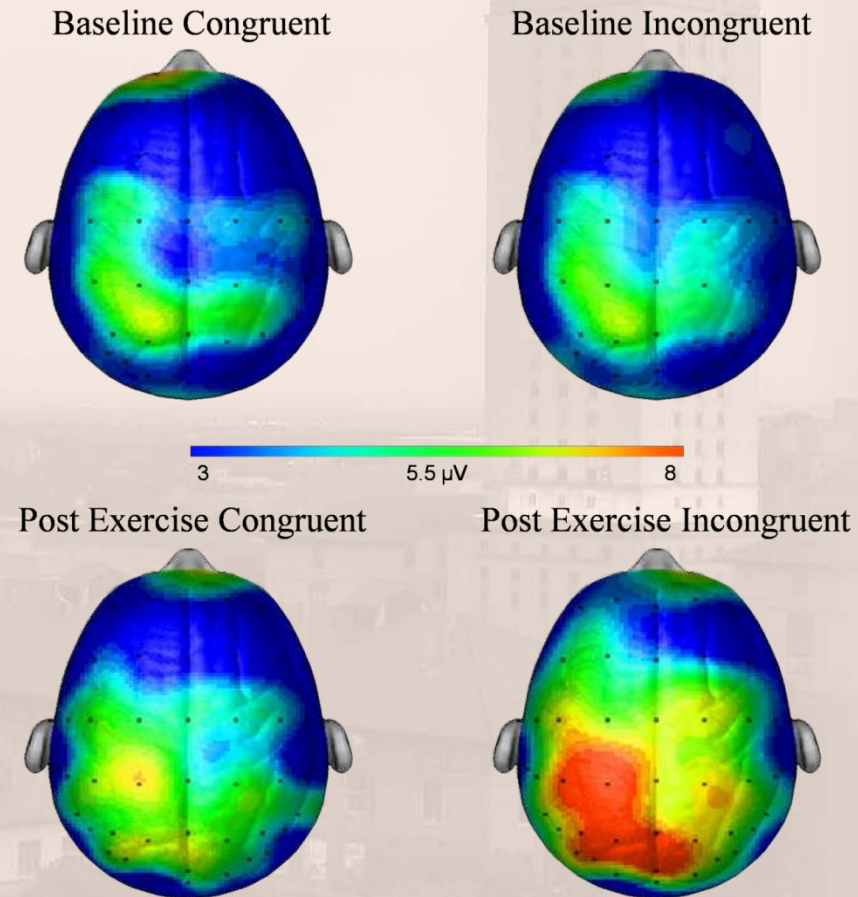
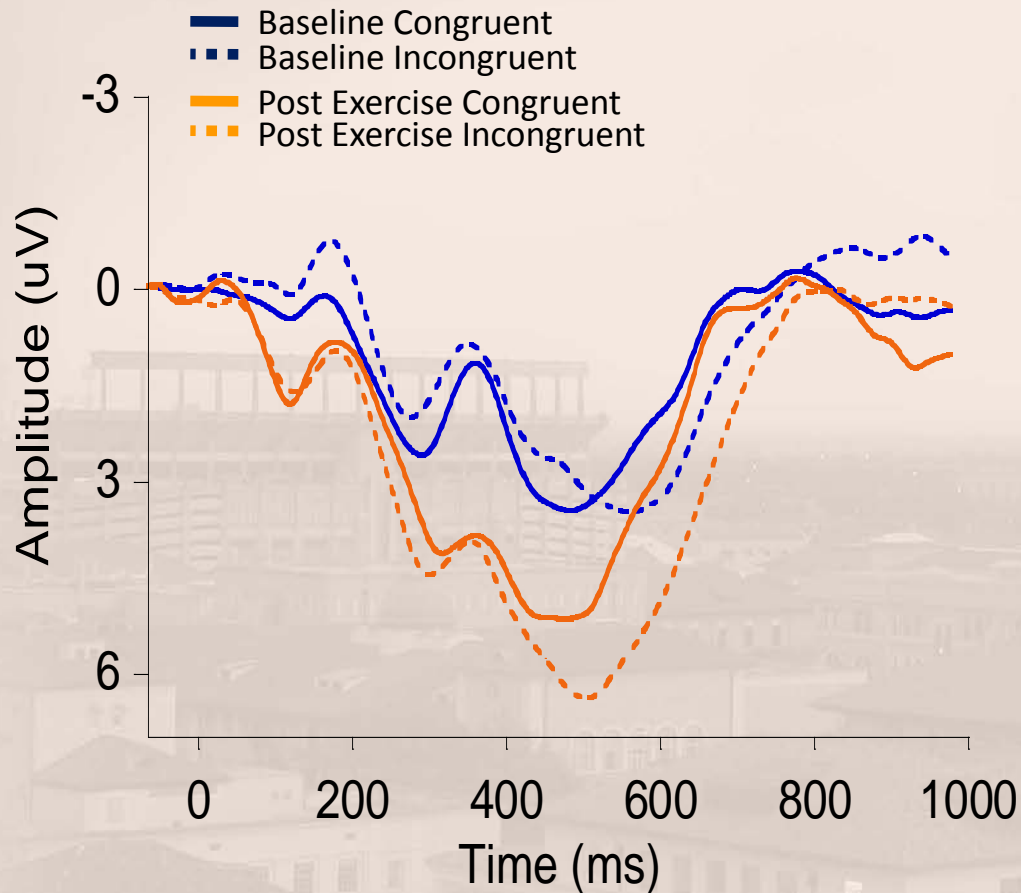


- Congruent/non-congruent (i.e., Stroop, Go/NoGo)



Green	Blue
Blue	Red
Red	Green

# Acute Exercise in Preadolescent Children



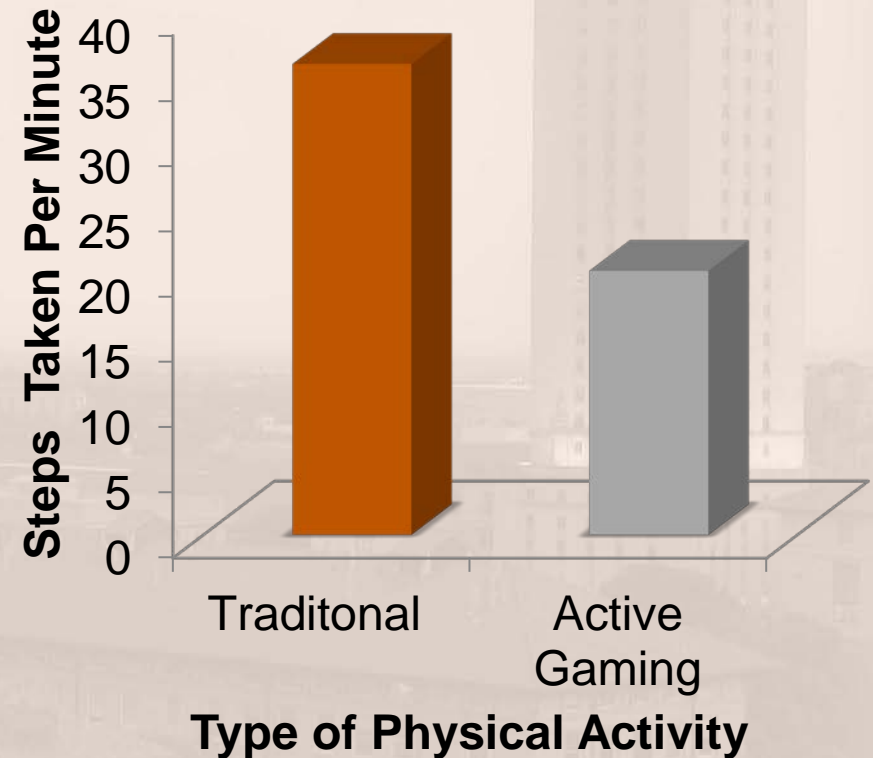


# Acute Dose - Response: Kinetic Kidz

Teacher-Led Fitness Activities	Active Gaming
1.43 ± 1.11 cal/kg/min	0.89 ± 1.00 cal/kg/min <sup>a</sup>

Note: a = p < .01

Centeio et al., 2011



# Summary of Acute Effects of PA

Less than 5-mins	5-10 mins	20-mins	30-mins	60-mins
Attentional Reset	Attention On/off task behavior	Memory, Inhibitory control, Task flexibility	Lasting effects	Need another PA break
Shake Activity	Numbers Activity	Recess	Physical Education	Brain Break
	Howie & Pate, under review	Hillman et al., 2009	Phillips et al., under review	Tompsonski et al., 2003

The background of the slide is a faded, sepia-toned aerial photograph of a city. A prominent feature is a tall, multi-story building with a distinctive tower-like top, located on the right side of the image. The rest of the city is composed of various other buildings and structures, all rendered in a light, monochromatic tone.

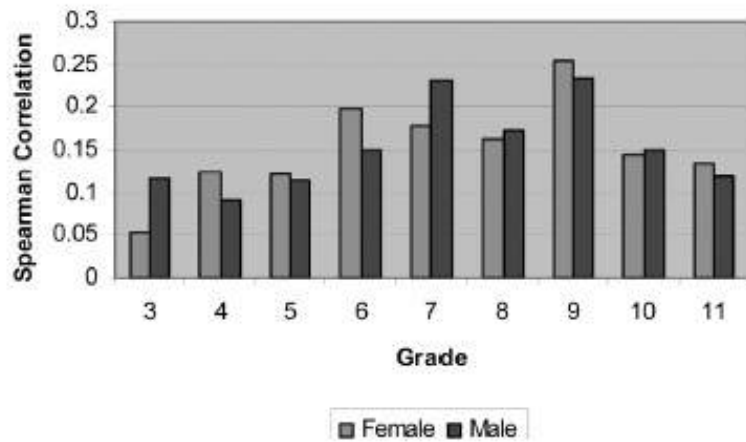
**What are the effects of physical activity over time?**

# Physical Fitness & Unexcused Absences

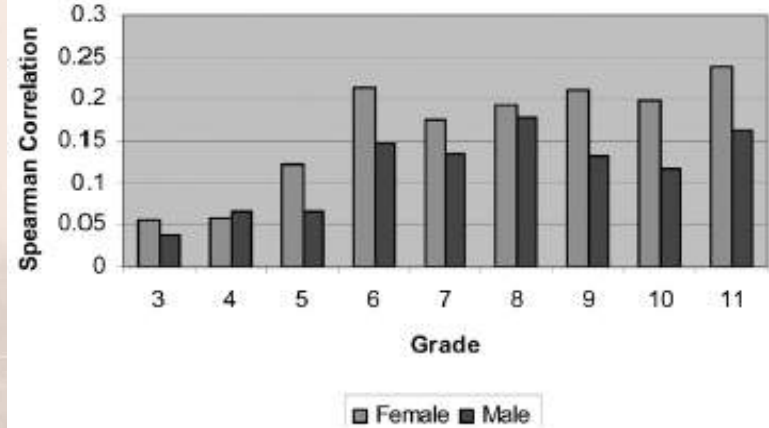
	Unstandardized	Standardized	p-value
PACER time	-.029	-.092	.034
One-mile run time	.351	.142	<.001
Grade	.950	.143	<.001
BMI	-.153	-.126	<.001
Male Gender	.566	.041	.238
White Race	-.391	-.022	.457
Free/Reduced Lunch	.372	.024	.419
Attitudes towards PA	-.015	-.028	.353

# Texas Fitness Study

Observations = 38,992; Districts = 1,263; Schools = 6,365  
(83% of Texas students grades 3-12)



**Figure 1.** Spearman correlations between cardiovascular fitness achievement and Texas Assessment of Knowledge and Skills achievement by age and grade level.



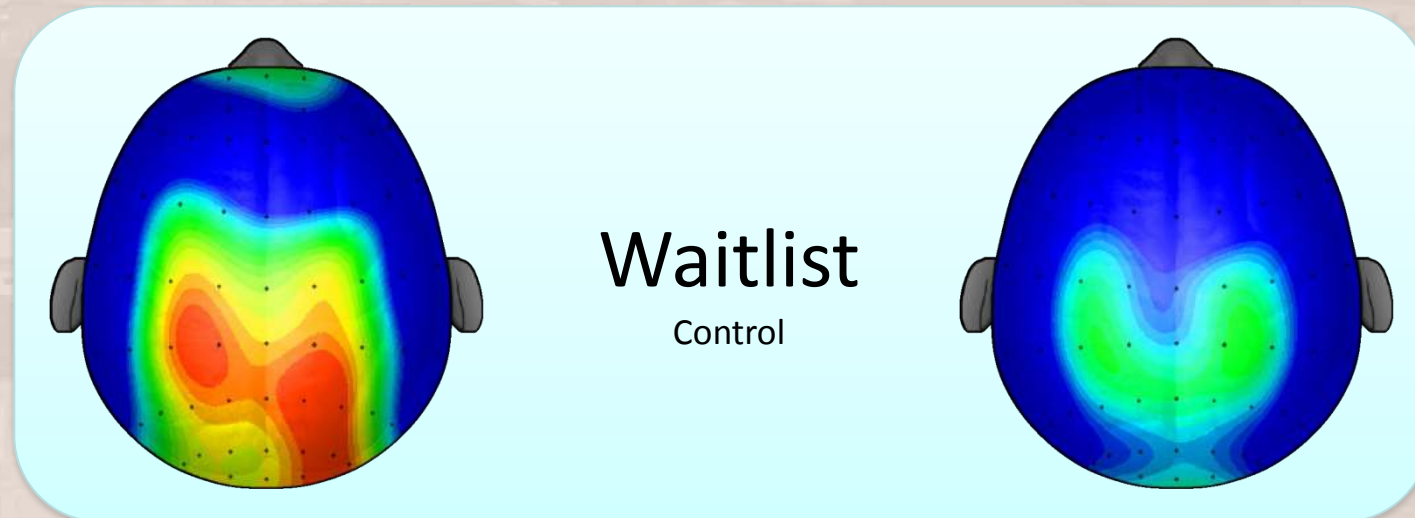
**Figure 2.** Spearman correlations between body mass index fitness achievement and Texas Assessment of Knowledge and Skills achievement by age and grade level.

(Welk, Jackson, Morrow, Haskell, Meredith, & Cooper, 2010)

# FITKids: Inhibition Task

Pre-test

9 Months Later



# FITKids Findings



- Aerobically fit children have faster response time, better accuracy, & allocate more working memory toward a given task (Kamijo et al., 2011)
- The intensity of physical activity matters (Castelli et al., 2011)
- Adiposity inhibits cognitive performance (Kamijo et al., 2012)
- The amount of PA (+60 mins) **impacts** brain & cognitive health (Hillman et al. under review)

Funded by NICHD R01 NICHD (2012-2017)



# Other Randomized Controlled Trials

- Classroom PA academic lessons improved academic performance (Donnelly et al., 2010 & 2011)
- Better spatial, reading & math performance after a 10-wk PA program (Fredricks et al., 2006)
- Academic performance was not different between intervention groups (Ahamed et al., 2007)



# Part 3: What evidence do we currently have that CSPAP is the right direction to go in?

Leslie's Activity: Vocab game

1. Facilitate
2. Collaboration
3. Policy
4. Feasible
5. Efficacy

# Evidence that CSPAP Works

1. Current practice
2. Teacher's perceptions of CSPAP
  - Self-efficacy
3. Professional development & CSPAP
4. Student physical activity levels

# 1. Current Practice & CSPAP

## Current Practice Among Teachers

1. Develop lists of equipment & activities that promote PA
2. Create a PA plan
3. Generate strategies for communicating with parents
4. Points of decision prompts
5. Develop strategies for hosting community events
6. Create PA videos
7. Offer family PA nights

Beighle et al., 2009

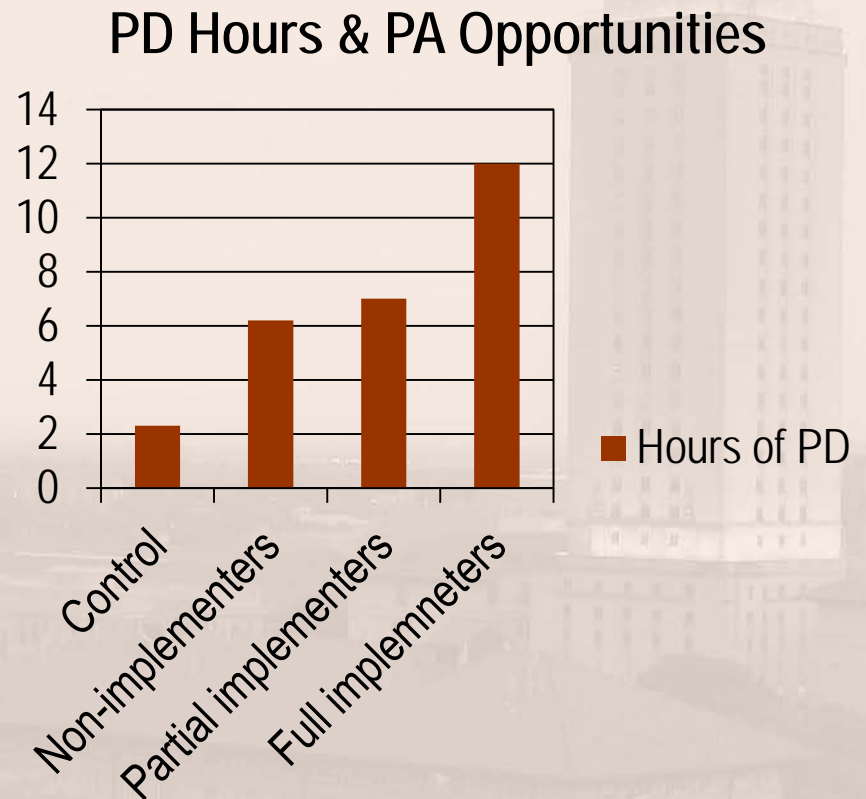
## Current Practice in PETE

- 53% complete CSPAP related assignments
- 33% apply CSPAP during a field experience
- 29% introduce CSPAP as differentiated learning
- More than 60% of the programs: Teach recess games; promote PA in the home; classroom PA breaks; PA homework; family nights

Castelli, Carson, & Beighle, 2011

## 2. CSPAP and Professional Development

- Physical education teachers (n = 330) from 9 different states
- Comparison of control, non-implementers, partial, & full implementers of CSPAP
- The more professional development hours, the more likely the teachers were to be full implementers of CSPAP



Centeio, Barcelona, Beighle, Carson, & Castelli (submitted for review)

# Preparing Educators to Promote and Provide Physical Activity in Schools

**Abstract:** *Today, children are at risk for disease stemming from the prevalence of sedentary behaviors. Schools are largely obesogenic environments but have the potential to promote and provide opportunities to meet the recommended daily minutes of physical activity. Yet educators must be prepared to do so. The objective of this review was to examine the strength of evidence from studies on professional development effectiveness in order to make recommendations on how to structure such experiences to prepare teachers to promote and provide physical activity in schools. Effective strategies for professional development that were confirmed in the literature focused on knowledge of subject matter, collective and collaborative participation, continual and long in duration, coherence with student learning, active learning, and the building of a community of practice. Further, research to examine the effectiveness of professional development on student physical activity participation within the school environment is warranted.*

**Keywords:** professional development; physical activity; teachers; multicomponent approach; learning

Schools are an ideal place for children to be physically active as a means of disease prevention and treatment.<sup>1,2</sup> Previously identified in multiple publications, such as the National Physical Activity Plan,<sup>3</sup> the importance of physical activity in schools is unequivocal. The *Accelerating Progress in Obesity Prevention: Solving the Weight of Nation*<sup>4</sup> proposed that all children engage in 60 minutes of moderate to vigorous physical activity per day, with most happening

as suggested by the *Physical Activity Guidelines for Americans Mid-course Report: Strategies to Increase Physical Activity among Youth*.<sup>5</sup> Specifically, it is recommended that a quality physical education curriculum be the foundation of comprehensive opportunities for students to be physically active throughout the school day and that federal, state, and local policies require schools to provide these comprehensive programs. Yet although schools can provide the

... it is recommended that a quality physical education curriculum be the foundation of comprehensive opportunities for students to be physically active throughout the school day . . .

during school. There is sufficient evidence that a multicomponent approach, interventions that implement 2 or more strategies at the same time, has the greatest potential to increase physical activity engagement among students in schools,

maximal access to children and effective strategies for increasing physical activity, they remain largely sedentary environments.

Despite evidence of the positive benefits of physical activity, reductions in



# Professional Development Recommendations



**Table 1.**  
Educator Professional Development: Elements, Strategies, and Future Research.<sup>a</sup>

Element of Professional Development (Strength of Evidence)	Effective Professional Development: Strategies to Promote and Provide Physical Activity	Future Research
Knowledge of subject matter (highly supported)	<ul style="list-style-type: none"> <li>Involve both physical education and generalist teachers</li> <li>Align facilitators with teacher needs and context</li> <li>Knowledge should be applicable and transferable to the context</li> <li>Facilitators focus on the heuristics for generating knowledge                             <ol style="list-style-type: none"> <li>Develop school–university partnership</li> <li>Use local expertise (eg, American College of Sports Medicine certification trainer to demonstrate how to teach spin class)</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>Objectively track student physical activity post training</li> <li>Evaluate dissemination strategies</li> <li>Record intervention fidelity and efficacy in relation to teacher emotions and self-efficacy</li> <li>Conduct intervention studies with long-term follow-up</li> <li>Compare the intervention effects across teacher subject matter and grade level</li> <li>Examine the effectiveness of curriculum materials as professional development</li> </ul>
Collective and collaborative participation (highly supported)	<ul style="list-style-type: none"> <li>Leadership mandate that all teachers Especially valuable for physical education teachers</li> <li>be involved</li> <li>Allow teachers to implement the new ideas in their own teaching</li> <li>Target early adopters as mentors</li> </ul>	
Continual, long duration (moderately supported)	<ul style="list-style-type: none"> <li>Allow teachers to witness the outcome of their efforts</li> <li>Develop feedback loop</li> <li>Train teachers to make data-driven decision</li> </ul>	
Coherent with student learning (somewhat supported)	<ul style="list-style-type: none"> <li>Record and track teacher goals</li> <li>Focus on student achievement</li> </ul>	
Active learning (somewhat supported)	Provide opportunities for engagement, inquiry, and recording of teacher behaviors	
Builds community of practice (CoP) (highly supported for within a school district/ limited support for beyond a school district/no evidence supporting virtual CoP)	<ul style="list-style-type: none"> <li>Provide teachers with release time to engage in the discourse of their discipline (eg, PEP-Talk)</li> <li>Promoting sharing among trusted grade-level and subject-matter teams</li> </ul>	

- Knowledge of subject matter
- Collective & collaborative
- Continual, long duration
- Builds community of practice (evidence only at the local level)

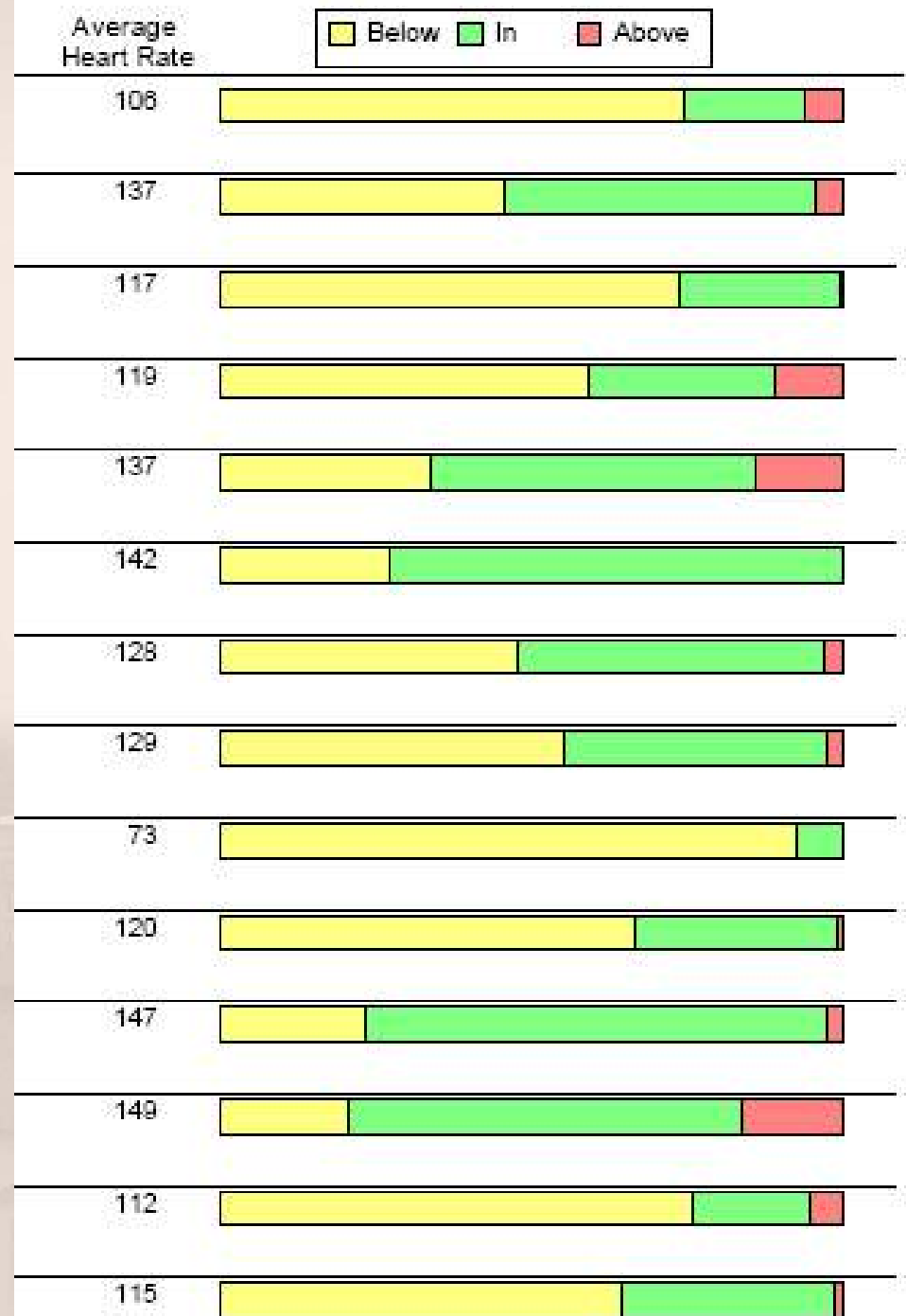
<sup>a</sup>Elements derived based on Desimone (2009, 2011).<sup>24,26</sup>

# Professional Development

The students in this class just completed a Pickleball lesson. The graph on the right displays the average heart rates for the lesson.

Did the lesson improve cardiorespiratory endurance for most of the students? Why or why not?

Should the lesson be modified? If so, how?



# Methodology: Data Sources

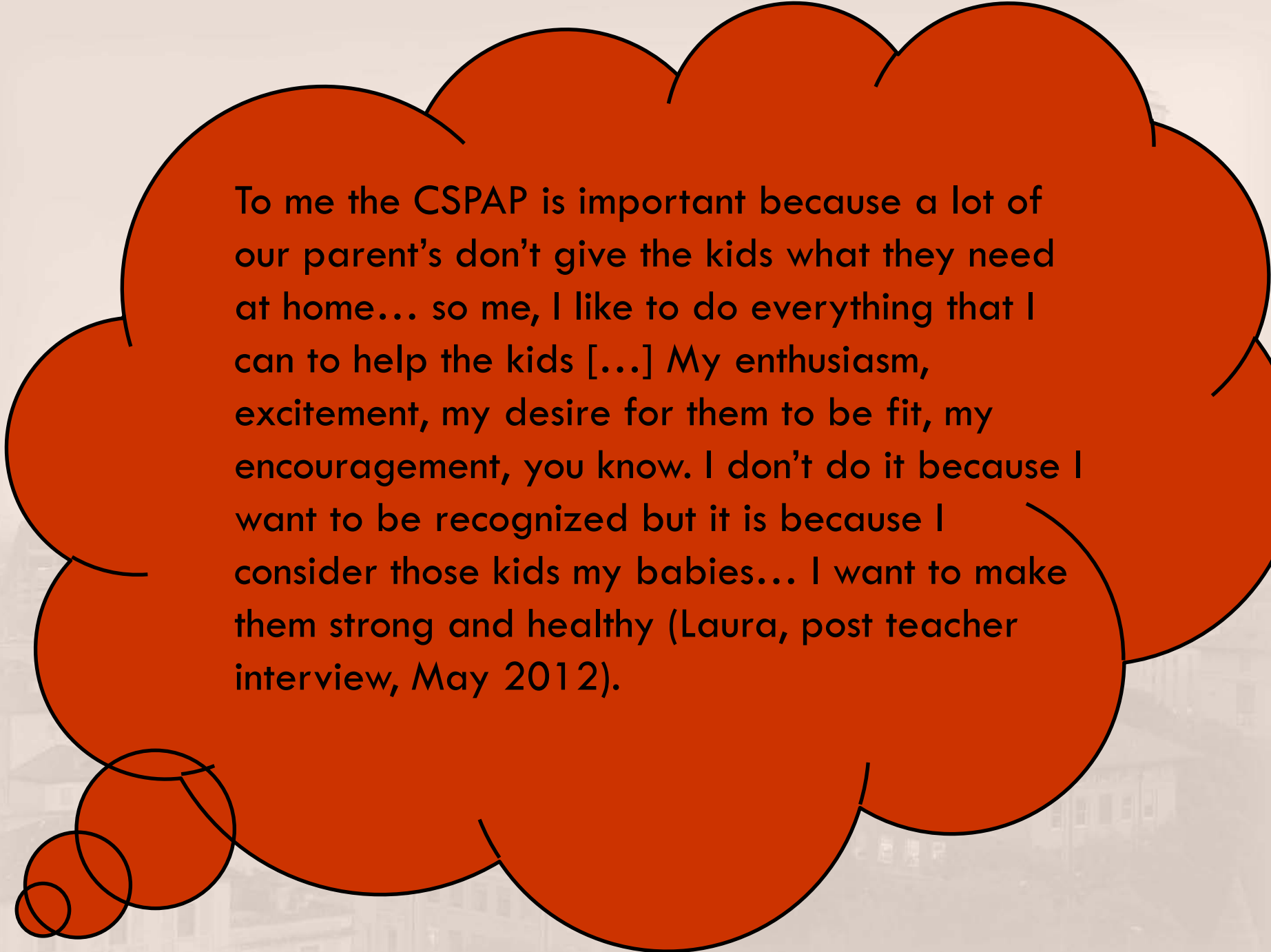
Mixed-methodological collective case study design

- CSPAP Index (Pre/Post)
  - Modified from S-PAPA (Lounsbery & McKenzie, 2010)
  - Control/treatment groups
- Teacher interviews
- Action plan & artifact collection
- E-learning
- Site visits & observations
- Researcher journal



# 3. Teachers' Perceptions of CSPAP

1. What were teacher perceptions of and efficacy toward providing physical activity opportunities for children?
2. What were teacher perceptions, attitudes, and feelings toward the implementation of CSPAP?



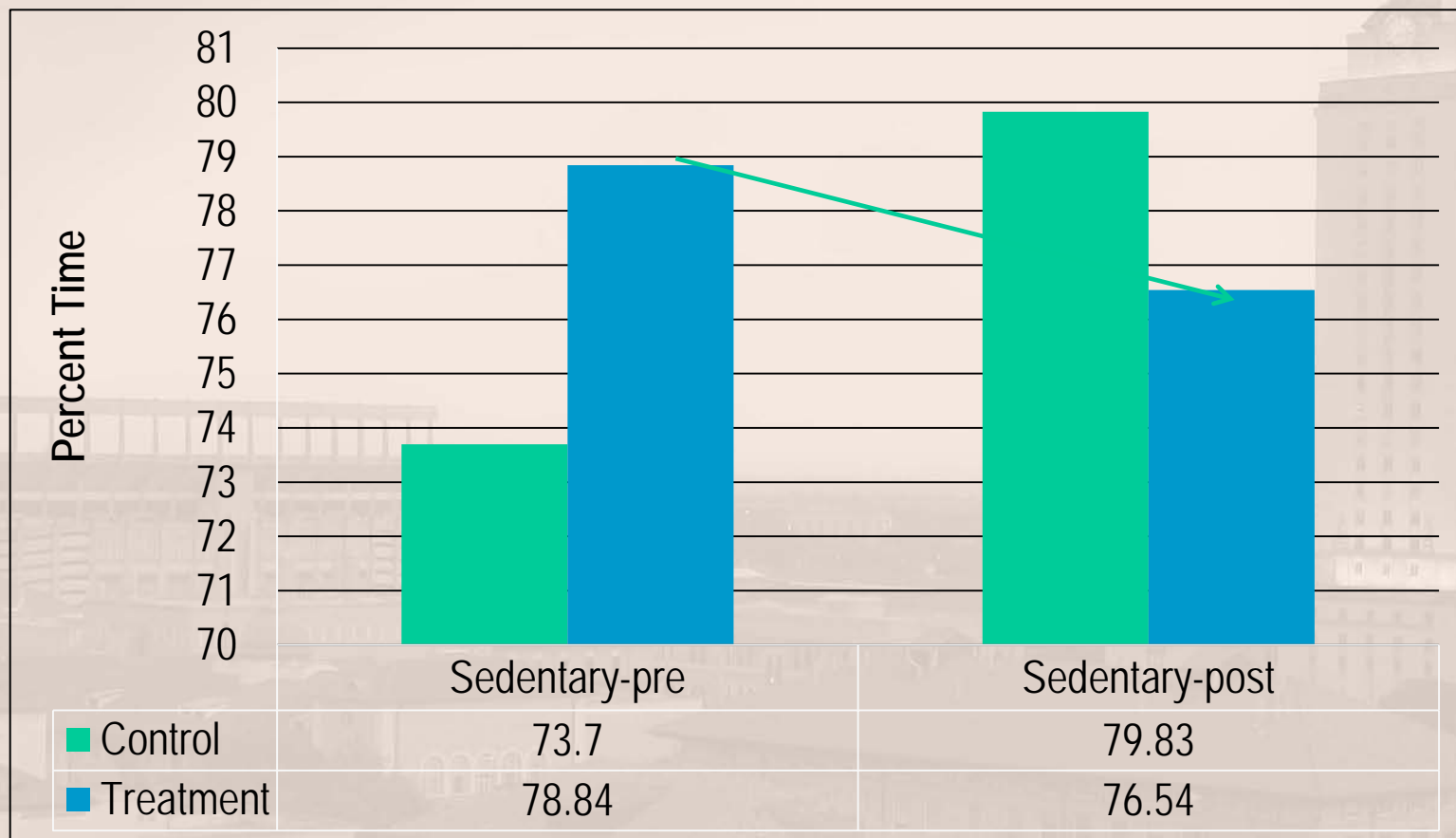
To me the CSPAP is important because a lot of our parent's don't give the kids what they need at home... so me, I like to do everything that I can to help the kids [...] My enthusiasm, excitement, my desire for them to be fit, my encouragement, you know. I don't do it because I want to be recognized but it is because I consider those kids my babies... I want to make them strong and healthy (Laura, post teacher interview, May 2012).

# Keys to CSPAP Implementation

## Three Keys to Successful Implementation

- ✓ Action plan
  - Forced teachers to plan ahead
  - Reminded them to collect artifacts & to celebrate their success
- ✓ Supportive administration
- ✓ Passionate champion
- ✓ Self-efficacy

# 4. Student Physical Activity



Note: Significant reduction in sedentary time for treatment group  $F(1, 297) = 28.00, p < .001,$

# Odds Ratio for CSPAP Success

- CSPAP implementation significantly increases PA opportunities in schools
- Increasing weekday PA reduces the likelihood of unhealthy BMI
- Increasing PA and physical fitness improves the odds that children will succeed in school

The bottom line...

“If we implement CSPAP the odds will be forever in our favor!”

# Recommendations

- Champion physical activity across the curriculum
- Become a Physical Activity Leader (PAL)
- Implement CSPAP in your school
  - No more than 60-mins of sedentary time
  - At least 10-mins of physical activity after sedentary time
- Start small, by improving one key element (e.g. during school PA)
  - Work toward having 60-mins of physical activity in the school curriculum

# Marana Middle School, Let's Move!

Marana Middle School was selected as one of the September 11 scheduled stops in the Tucson area by the U.S. Department of Education's "Strong Start, Bright Future" back-to-school bus tour. The School hosted a First Lady's Let's Move! Active Schools event to bring physical activity back to America's schools.





Questions? [dcastelli@utexas.edu](mailto:dcastelli@utexas.edu)  
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