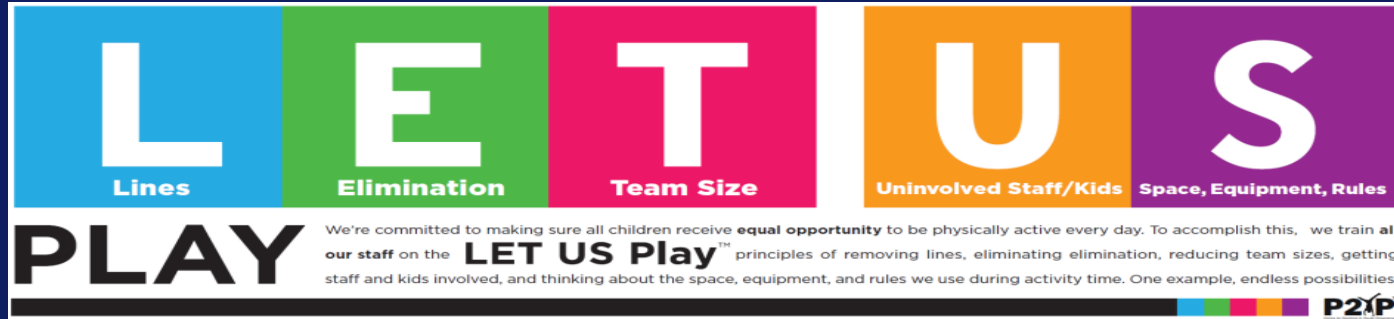


## LET US Play

Lines • Elimination • Team Size • Uninvolved Staff/Kids • Space, Equipment and Rules

# Breaking tradition: Maximizing children's physical activity by modifying traditional games with the LET US Play principles



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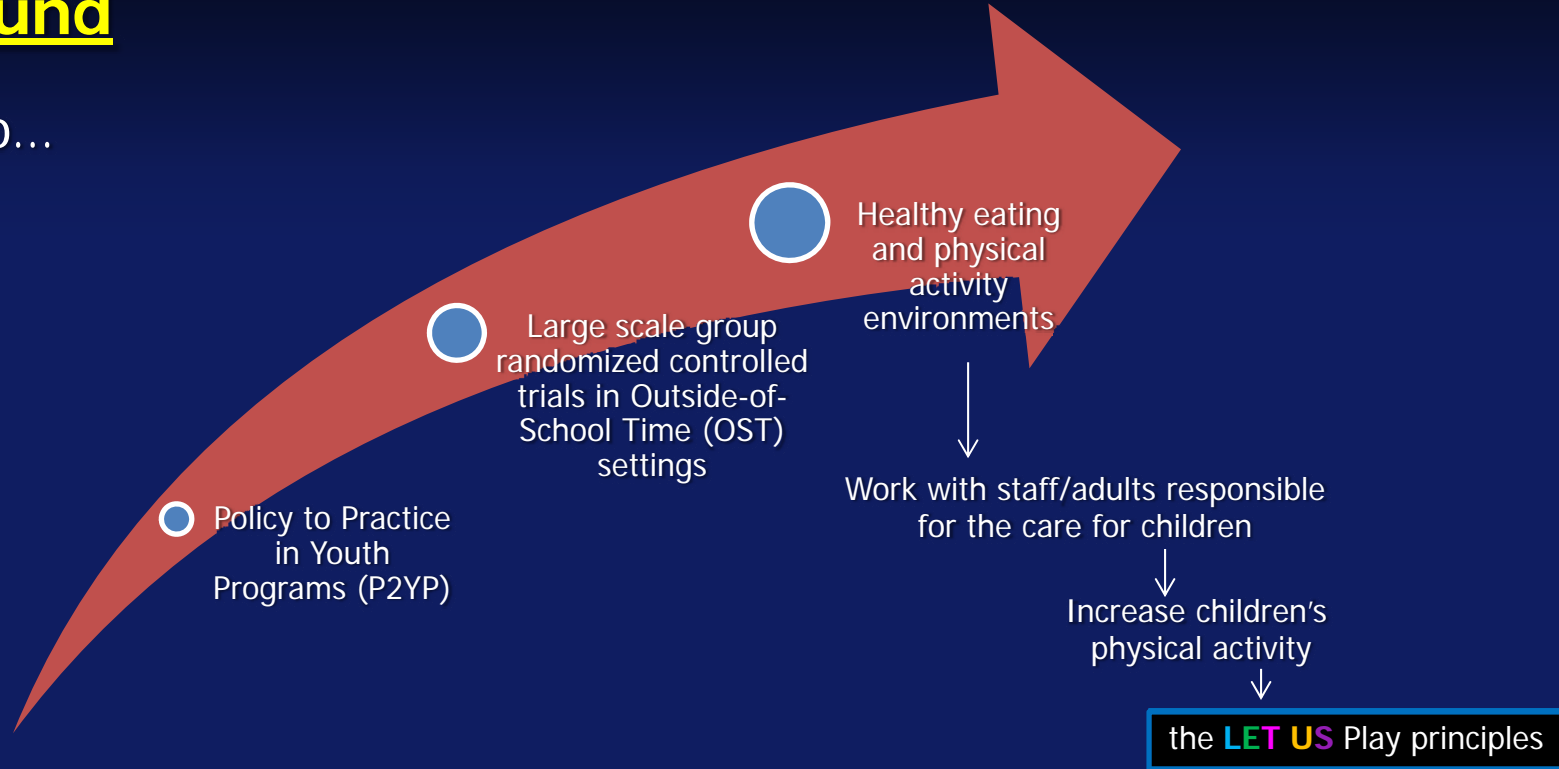
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# Background

What we do...



# Background

What are the LET US Play principles?

*Strategies to maximize MVPA*



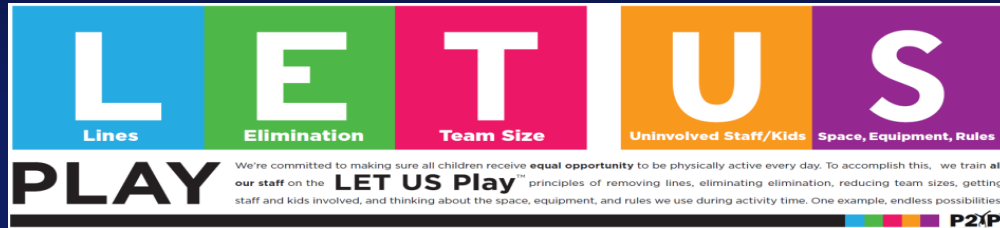
What makes the LET US Play principles different?

***No** new equipment, new games or curriculum*



## Background (evidence)

GROUP RANDOMIZED CONTROLLED TRIAL IN AFTERSCHOOL PROGRAMS\*



Intervening/training staff of 20 programs: *servicing >1700 children*

+ive change in staff behavior and reduction in inactive components of games: *systematic observation*

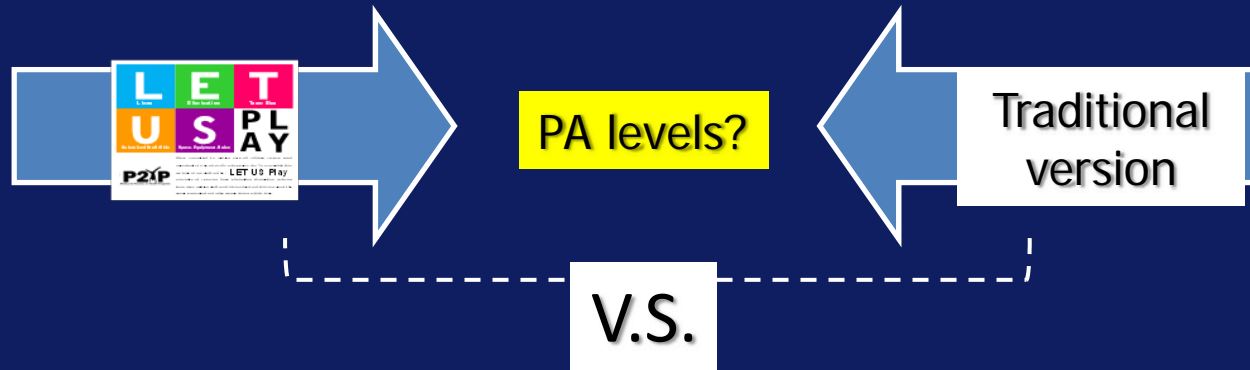
Increase in children's MVPA: *accelerometers*

\*Beets, M.W. et al. (in review). Making physical activity policy practice: A group randomized controlled trial on changes in moderate-to-vigorous physical activity in afterschool programs. *American journal of preventive medicine*.

So we've observed how LET US Play has a role in these positive changes... but we want experimental evidence that this stuff actually works!

## Purpose

To compare physical activity levels of children during games delivered in **traditional format** versus the games modified according to the **LET US Play** principles.



# Methods

Children (K-5<sup>th</sup> Grade) from a summer day camp

8 weeks → 4 sessions per day → 2 random days per week (Mon- Fri)

Scheduled 60 minute activity sessions

5-10 min	at start/end for accelerometer placement & demographic information
20 min	activity segment (either LET US Play or Traditional version)
10 min	water break
20 min	activity segment (either LET US Play or Traditional version)

6 commonly played games: Soccer, kickball, tag games, dodgeball, free play, relay races

Random counterbalanced design over 8 weeks

# Methods

1<sup>st</sup> session of day took place outdoors

- sports field (40 yds. x 25 yds.)
- soccer & kickball



2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> sessions conducted indoors

- gymnasium (27 yds. x 17 yds.)
- free play, dodgeball, tag games & relay races



All activity sessions led by same research team member (KB)

Children organized in to age appropriate groups  
Groups assigned to PA sessions on camp schedule



**by camp director  
(weekly)**

Children wore Actigraph GT3X+ accelerometers

# Methods

## Analysis

Only the **two 20 minute segments** used for analysis

Accelerometer data collected in 5-second epochs

- Matthews sedentary cutpoint threshold (<100 CPM)
- Evenson MVPA (>2296 CPM) cutpoint threshold used



Repeated measures mixed effects models

- estimate differences in % of time children spent in MVPA and Sedentary
- Explored sequencing effects of playing traditional versions or LET US Play first/second
- models run separately for girls and boys
- controlled for age and race



LET US Play  
vs.  
Traditional

Statistical analyses performed using Stata (v.13.1, College Station, TX).



## Methods

Table 1. Description of games and LET US Play Modifications

Game	Description	LET US Play Principles <sup>a</sup>					Modifications <sup>b</sup>
		L	E	T	U	S	
Kickball	2 teams (kicking and fielding). Kicker runs bases. Kicker eliminated if player/base is tagged, or ball is caught by fielding team.	X	X	X	X	X	Entire kicking team runs the bases together ( <b>L</b> ). Fielding team performs a task as a group ( <b>S</b> ). No 'outs', count number of 'runs' the kicking team can score in a given time (E.g. 5 minutes) ( <b>E</b> ). Split large groups of children into
Soccer	2 teams, 1 game (e.g., 10 v 10). Goalkeepers on each team.						Split one large game (E.g. 10 v 10) into smaller games (E.g. two 5 v 5 games) ( <b>T</b> ). Remove goalkeepers and reduce the size of the goals ( <b>S</b> ).
Dodgeball	2 teams. If child is tagged with the ball or if the ball is caught they are eliminated from the game.		X	X	X	X	Have players switch to the other side when they are tagged with the ball ( <b>E/S</b> ). Split a large game into two smaller dodgeball games ( <b>T</b> ).
Relay Races	Children in teams of 6 or more. Children wait in line for turn. Start and finish at one side of the activity area.	X		X	X	X	Remove lines by modifying the type of relay race (E.g. Teams start and finish in center, use different equipment and ways of moving) ( <b>L/S</b> ). Decrease the number of children on each team ( <b>T</b> ).
Tag Games	"Cross the Ocean", "Line Tag", and "Dungeon Ball" <sup>c</sup>		X		X	X	Have children who are tagged become additional catchers ( <b>E</b> ). Children perform an active task when tagged (during "line tag") or sent to the dungeon (during "dungeon ball") ( <b>S</b> ). Multiple taggers at the beginning of every game ( <b>S</b> )
Free Play	Equipment left in the same area for children to choose from.				X	X	Organize the equipment into separate areas in the free play space ( <b>S</b> ). Target inactive children and encourage them to play with the equipment ( <b>U</b> ).

<sup>a</sup> **L** = Lines, **E** = Elimination, **T** = Team size, **U** = Uninvolved staff/children, **S** = Space, equipment and rules

<sup>b</sup> Staff verbally encouraging children to be active and playing the games with the children is a modification implemented in all activities (**U**)

<sup>c</sup> "Cross the Ocean": One catcher in the middle of activity area. Children lined up at one side of activity. When called, children run to other side of activity area without being tagged. Eliminated if tagged

"Line Tag": One catcher, all children stay must stay on lines, when tagged, they sit down on line and act as a 'road block', game ends when everyone is seated

"Dungeon Ball": One catcher with a ball, if a child is tagged (dodgeball rules apply), the child is eliminated to the "dungeon"



## Findings: Descriptive data

Total Different Children:	267
Total Child Observations:	949
Mean age (years):	7.5
Sex (% Female):	43
Ethnicity (% African American):	29
Mean Children Per Session:	20
Sessions Scheduled:	64
*Sessions Completed:	50
Mean Number of Sessions Per Game:	8.3

\*If there was insufficient time and/or conditions to allow for data to be collected on two 20 minute activity segments then data collection did not take place

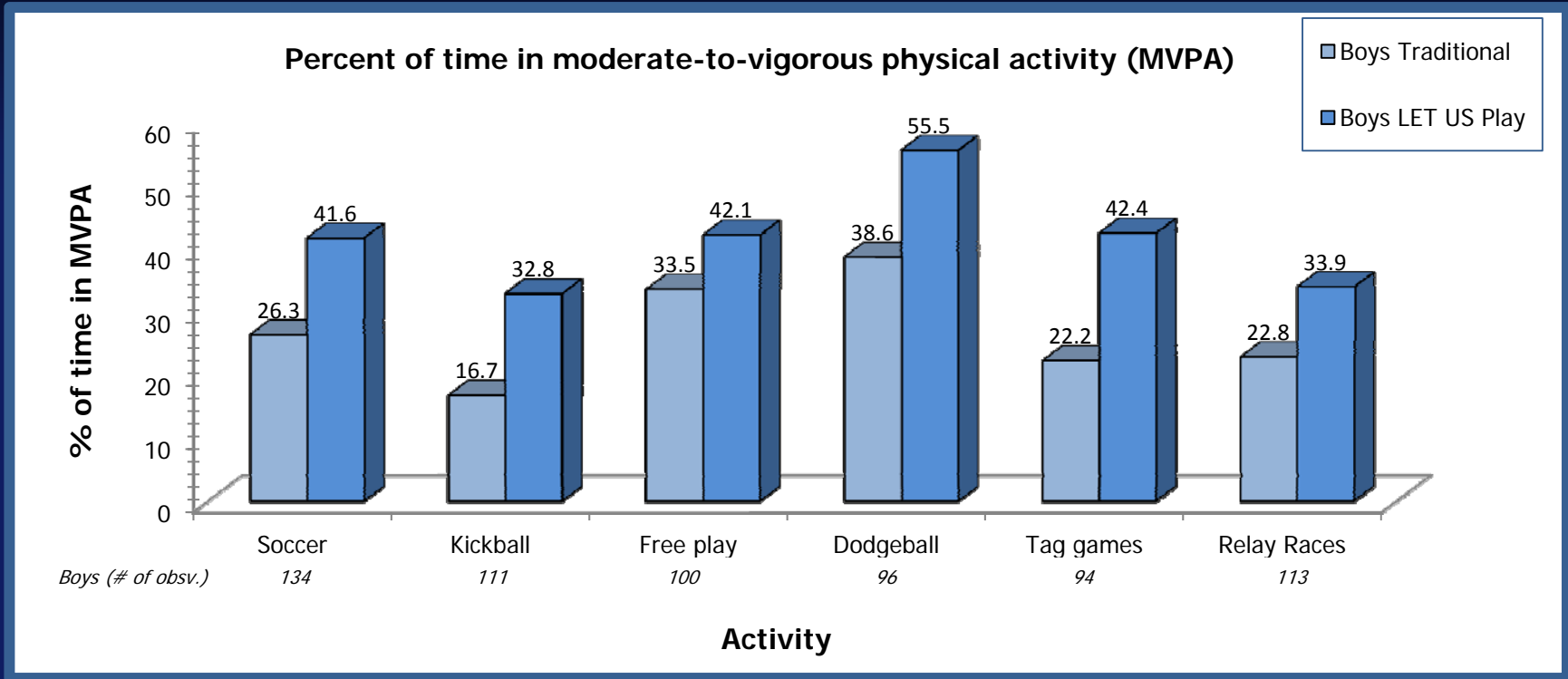
Examples: scheduling conflicts, slow group transitions, unsuitable weather

## Findings: Sequencing Effects (MVPA & Sedentary)

Game	Percent of time in moderate-to-vigorous physical activity <sup>a</sup>				Percent of time sedentary <sup>a</sup>			
	Traditional		LET US Play		Traditional		LET US Play	
	First	Second	First	Second	First	Second	First	Second
Soccer	28.9	27.0	45.1	40.9	18.7	18.1	6.0	7.6
Kickball	17.4	15.1	29.5	35.7*	45.6	46.0	29.8	21.8*
Free play	35.3	32.9	42.7	42.4	22.4	25.9	16.8	15.3
Dodgeball	34.4	37.0	54.5	49.8	32.3	30.1	8.5	12.5*
Tag games	21.4	19.8	41.7	40.3	47.0	48.1	16.7	18.3
Relay races	21.4	21.4	31.6	33.8	41.6	43.7	32.4	30.1
Overall	27.0	25.7	40.1	41.3	34.3	35.6	19.3	18.0

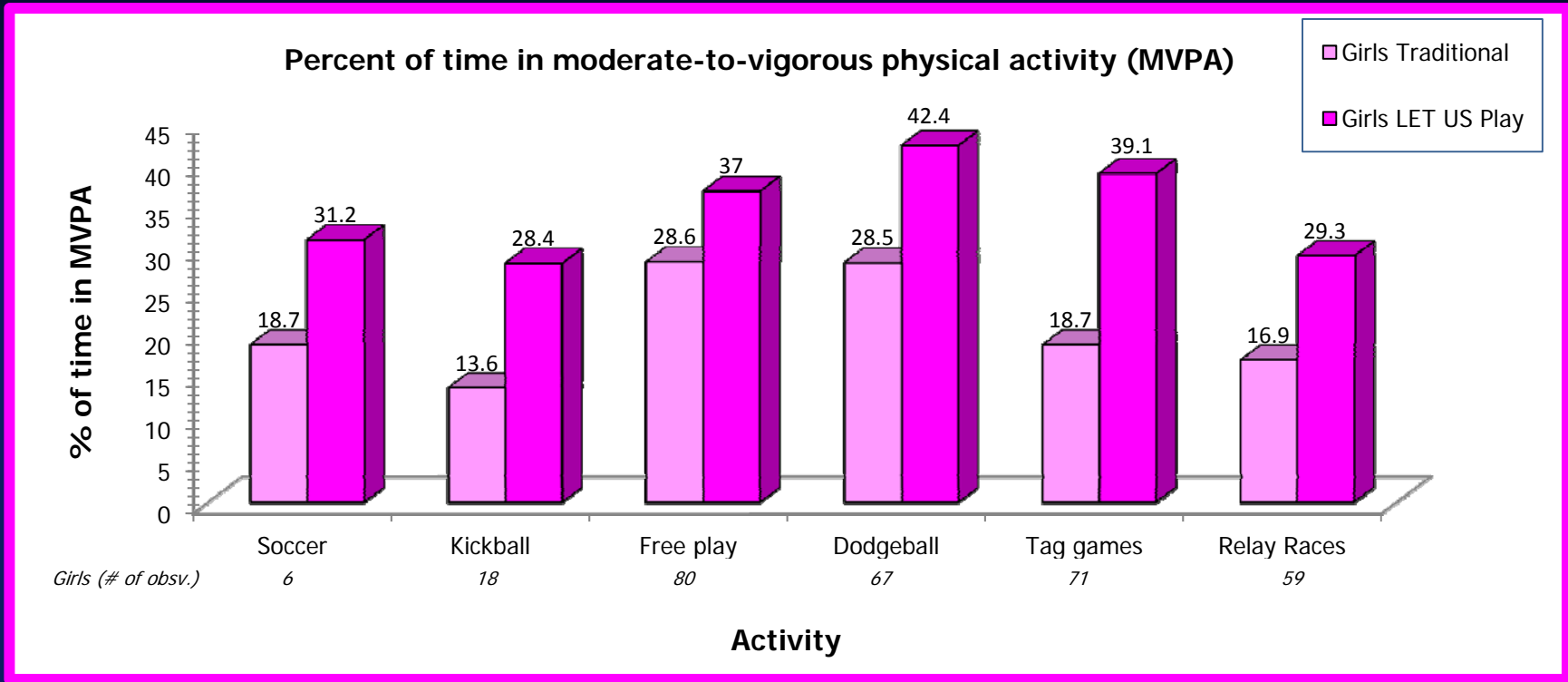
\* statistical significance between exposure (first vs. second) to traditional or LET US Play activity segments (p<0.05)  
<sup>a</sup> based on a 20 minute activity segment

# Findings: MVPA - Boys



All differences statistically significant ( $p < 0.05$ ).

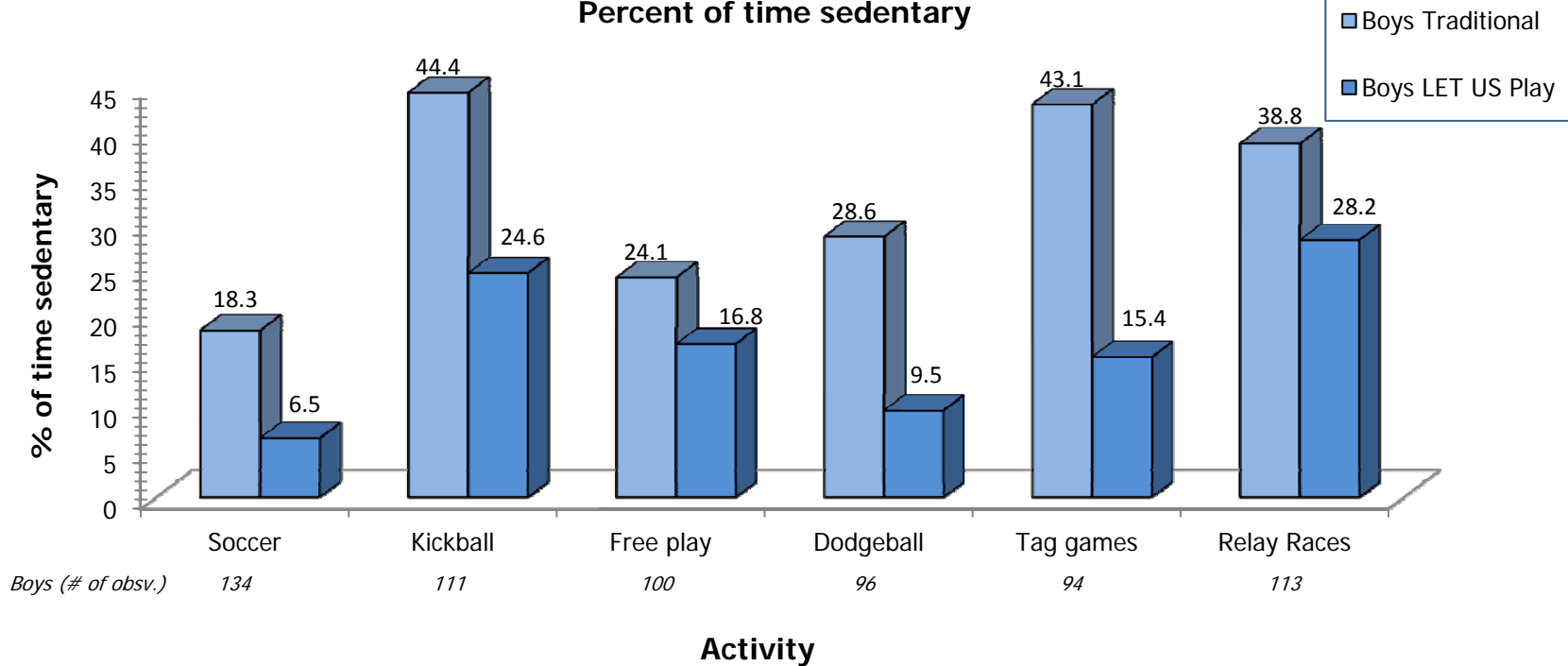
# Findings: MVPA - Girls



All differences statistically significant ( $p < 0.05$ ) except girls soccer and kickball. Insufficient observations for statistical analysis, raw means presented.

# Findings: Sedentary - Boys

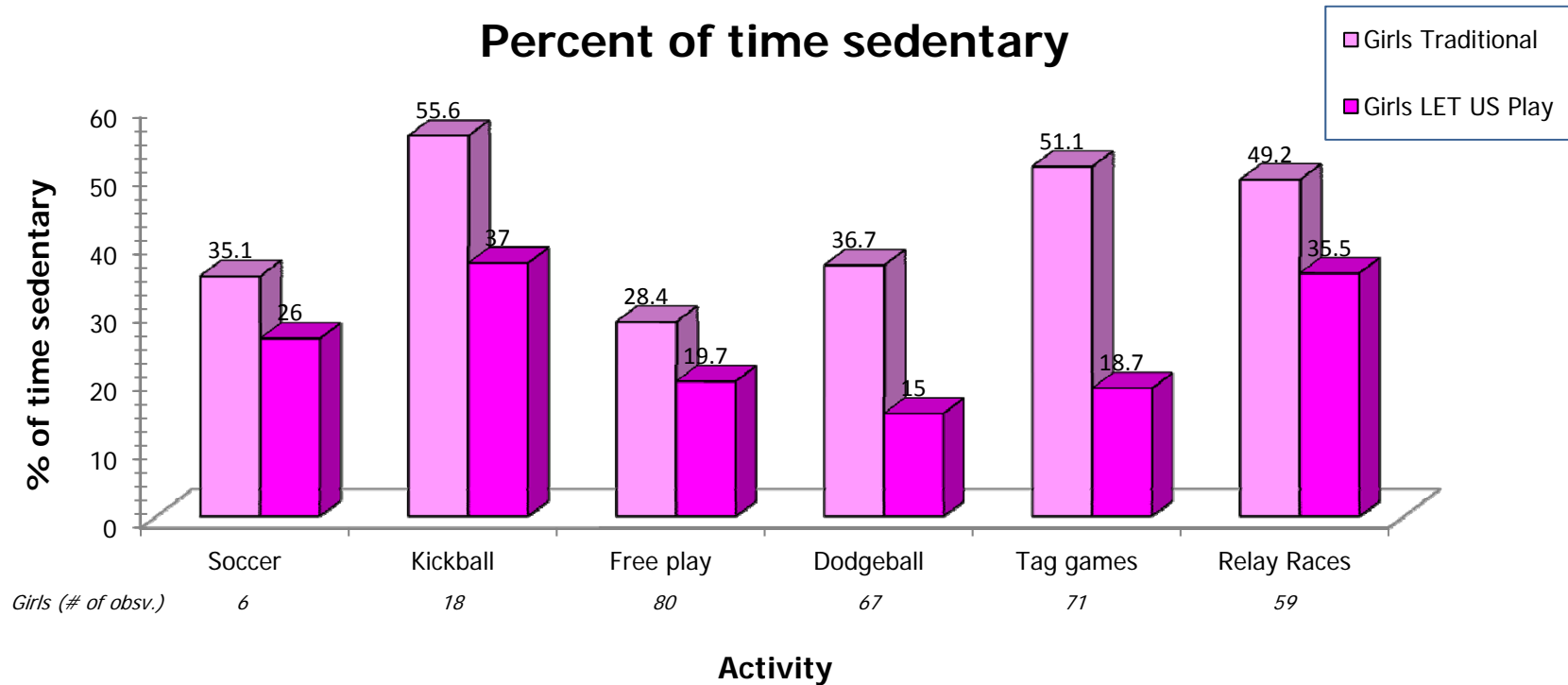
Percent of time sedentary



All differences statistically significant ( $p < 0.05$ ).

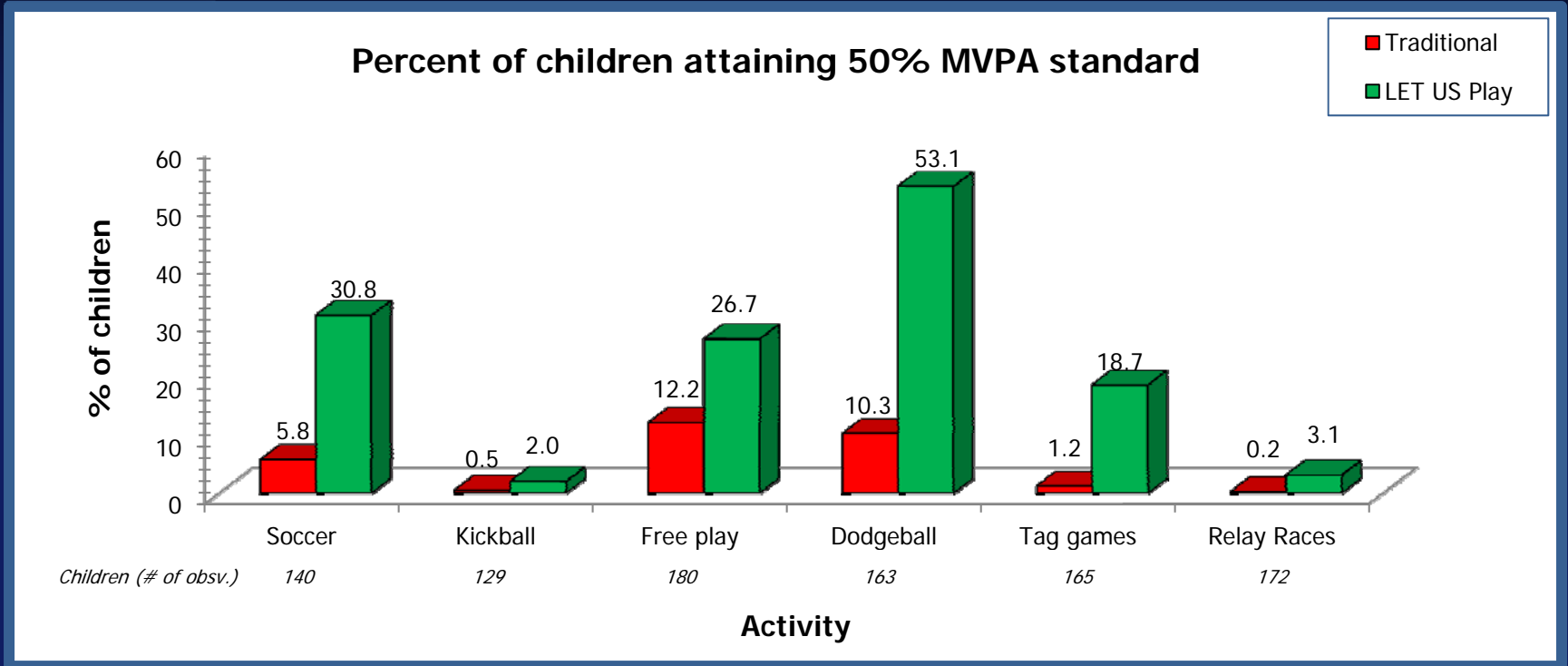
# Findings: Sedentary - Girls

## Percent of time sedentary



All differences statistically significant ( $p < 0.05$ ) except girls soccer and kickball. Insufficient observations for statistical analysis, raw means presented.

## Findings: 50% Time in MVPA Standard



All differences statistically significant ( $p < 0.05$ ) except kickball and relay races.

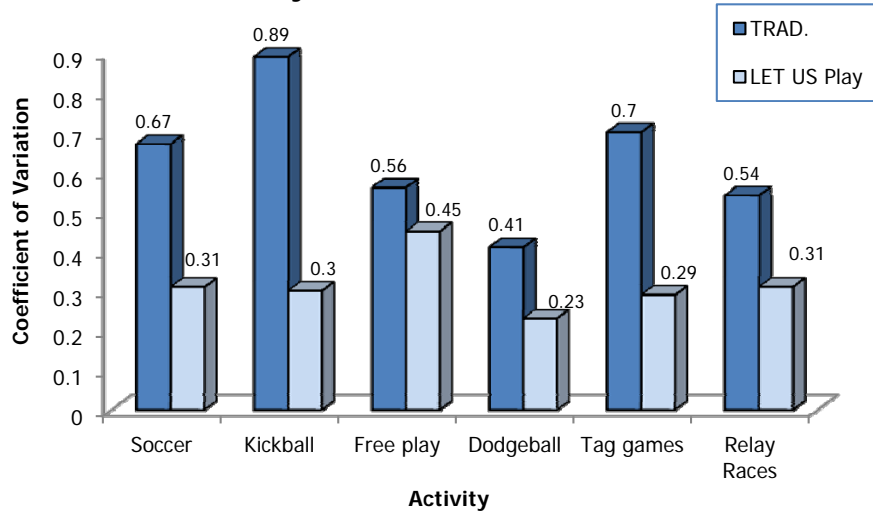




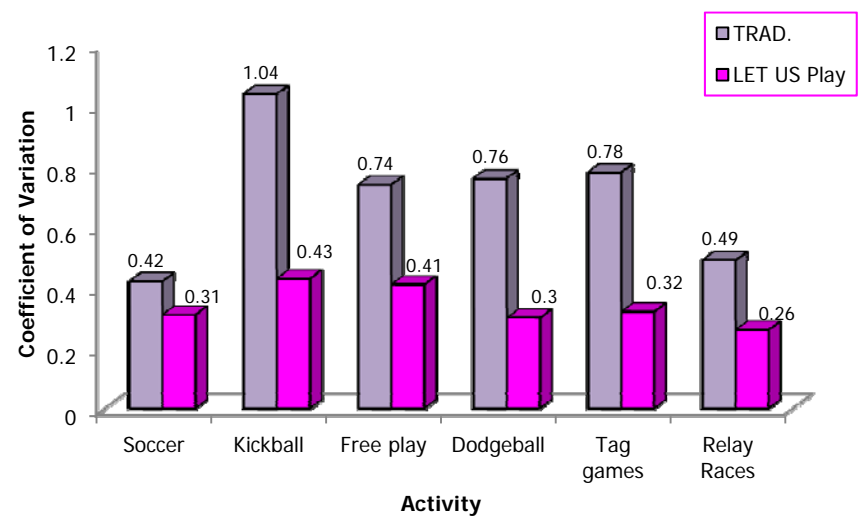
A closer look...

LET US Play has reach...

### Boys Coefficient of Variation



### Girls Coefficient of Variation



## Implications: Policy

Provides physical activities in which students are moderately to vigorously active for at least 50% of the physical activity time

Provide a minimum of 30 to 60 minutes of MVPA during the after school program.

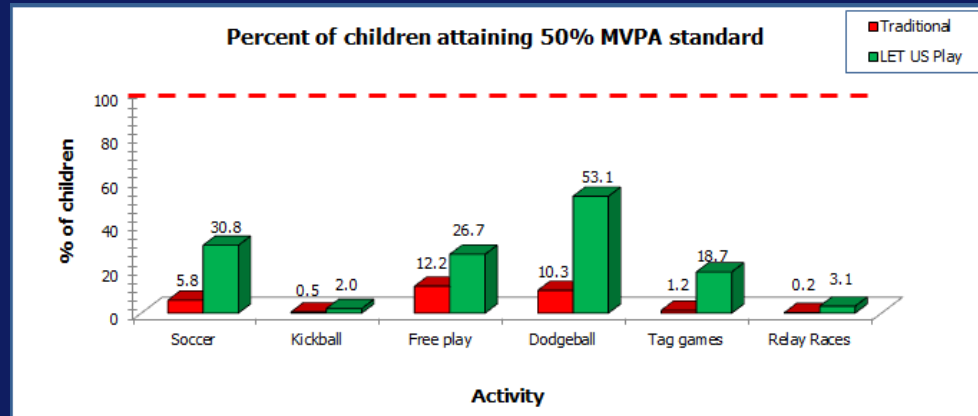
Are these policies **realistic for ALL children (i.e. 100%)**

Best efforts... "*half meet half*"

Language used in policy needs reconsidered



Identify appropriate MVPA goals for children



## Summary

### The LET US Play principles...

Lead to **GREATER** accumulation of MVPA for boys and girls across a diverse range of commonly played games



Can **INCREASE** the percent of children attaining 50% of time in MVPA standard



Can **REDUCE** the amount of time boys and girls spend sedentary during PA opportunities



.....simplistic, effective and economical strategies!

## Future Directions

- 'Frontline' staff member(s)
- Staff training dose-response relationship
- Different populations (E.g. youth with DD)
- Feasibility and acceptability of LET US Play principles for frontline staff and children

## Acknowledgements

Advisor: Michael W. Beets

Research team: Jessica Chandler, Jay Spearman,  
Daniel Haringa & Melissa Doheny.



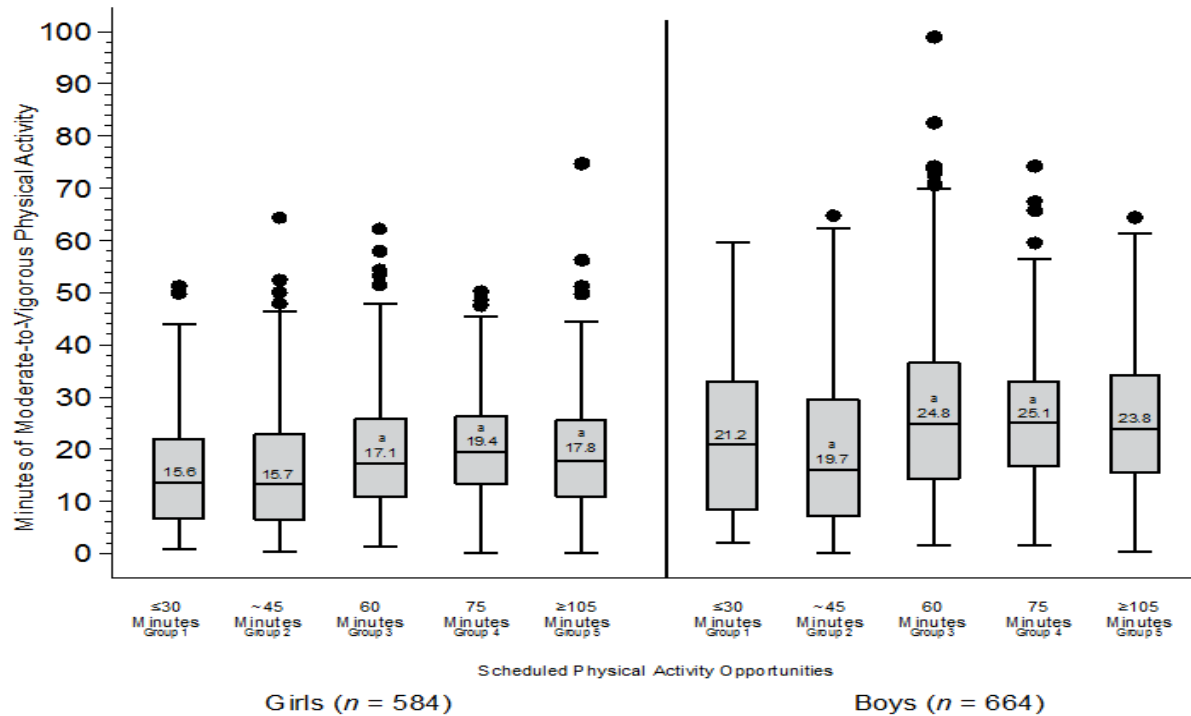
P2YP team: Glenn Weaver, Falon Tilley, Rahma Ajja, Becky  
Kyryliuk, Allison Randel, Mazen Aziz, Breonna Mealing

Site: Andrea Ward (Summer Camp Youth Program Coordinator)

# Thanks for listening!



Figure 1. Distribution of Moderate-to-Vigorous Physical Activity minutes/day for boys and girls across 5 groupings of allocated time



\* Statistical significance ( $p < 0.05$ ) in MVPA accumulated between allocating  $\leq 30$  min. d<sup>-1</sup> PA

Brazendale, K., Beets, M.W., Weaver, R. G., Huberty, J., Beighle, A.E., & Pate, R.R. (2014). Wasting Our Time? Allocated Versus Accumulated Physical Activity in Afterschool Programs. *Journal of physical activity & health.*

## Study Strengths

Random counterbalanced design

Use of objective measurement for PA

Familiarity of games examined

Large sample size

Multiple repetitions of experimental conditions

Consistency of experimental conditions

Specific analysis of 20min activity segments



## Study Limitations

Number of girls in soccer & kickball sessions

External Validity

LET US Play multi-component approach limits ability to delineate exact impact of each component

(e.g. L vs. E vs. T vs. U vs. S)