Children's Choices of Park Elements for Physical Activity

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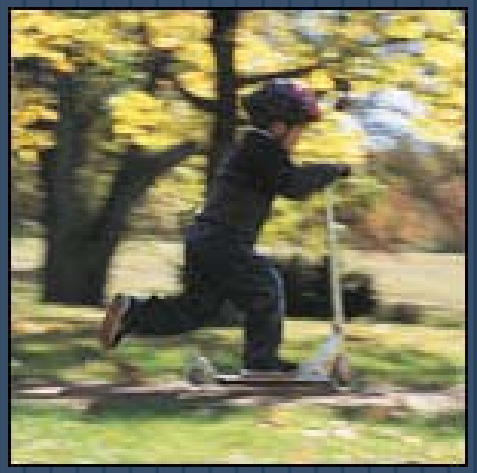
Youth Physical Activity Guidelines



- CDC
  - At least 60 minutes most days of the week
  - MVPA should make up most of the time
- National Association for Sport & Physical Activity (additional guidelines)
  - Engage in intermittent (stop & go) activities
  - Accumulated in bouts lasting 15 minutes or more
  - Participate in a variety of physical activities

Park access and physical activity

- Several studies have demonstrated an association of park access or park proximity with youth usual physical activity
  - Roemmich et al., Preventive Medicine, 2006
  - Roemmich et al., Annals of Behavioral Medicine, 2007
  - Epstein et al., Psychological Science, 2006
- Others have shown that park features are associated with youth usual physical activity
  - Cohen et al., Pediatrics, 2006
  - Scott et al., Journal of Urban Health, 2007
- Few studies have determined which park elements promote physical activity when older children or adolescents visit a park
  - Hayward et al., Environment and Behavior, 1974
  - Farley et al., Journal of Physical Activity and Health, 2008

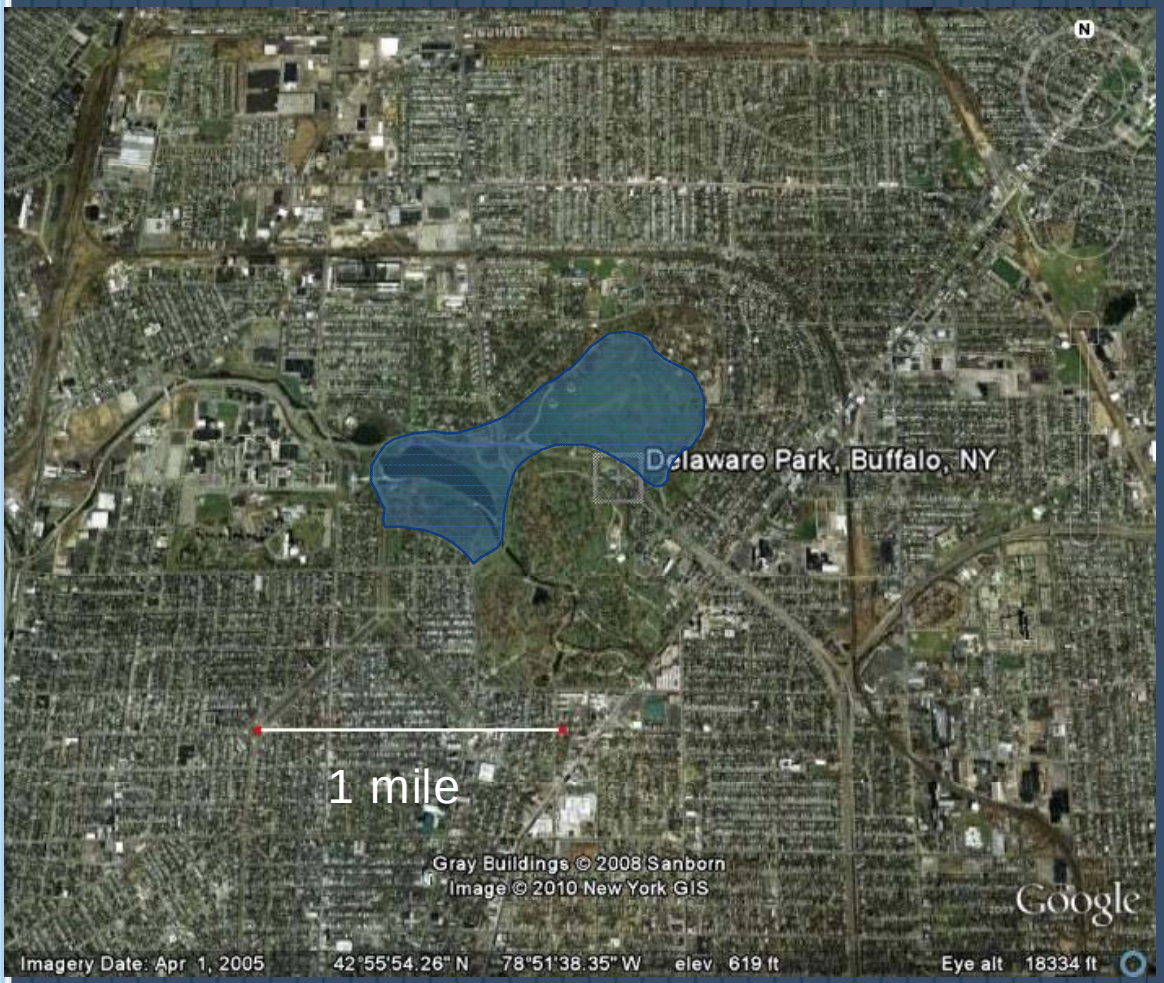
Specific aims

- Assess
  - Which park elements youth choose to use to be active
  - The intensity of activity and duration of use of park elements
  - How much activity youth accrue when visiting a park

Delaware Park as a laboratory

- Buffalo: sunniest and driest summers of any major NE city
- Delaware Park
  - 350 acre urban park of meadow, forest, lake, garden
  - Designed by Frederick Law Olmsted

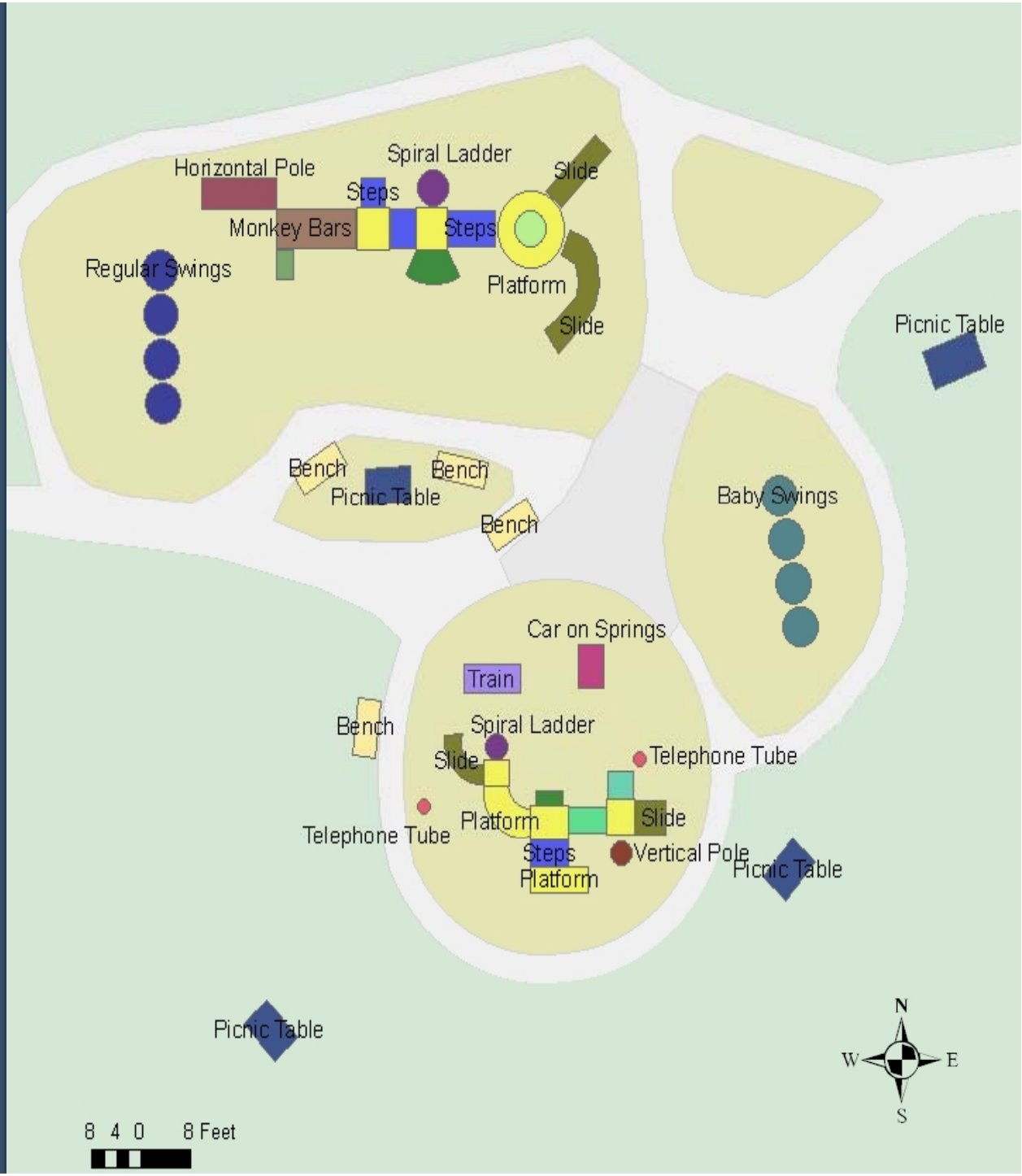
Delaware Park as a laboratory



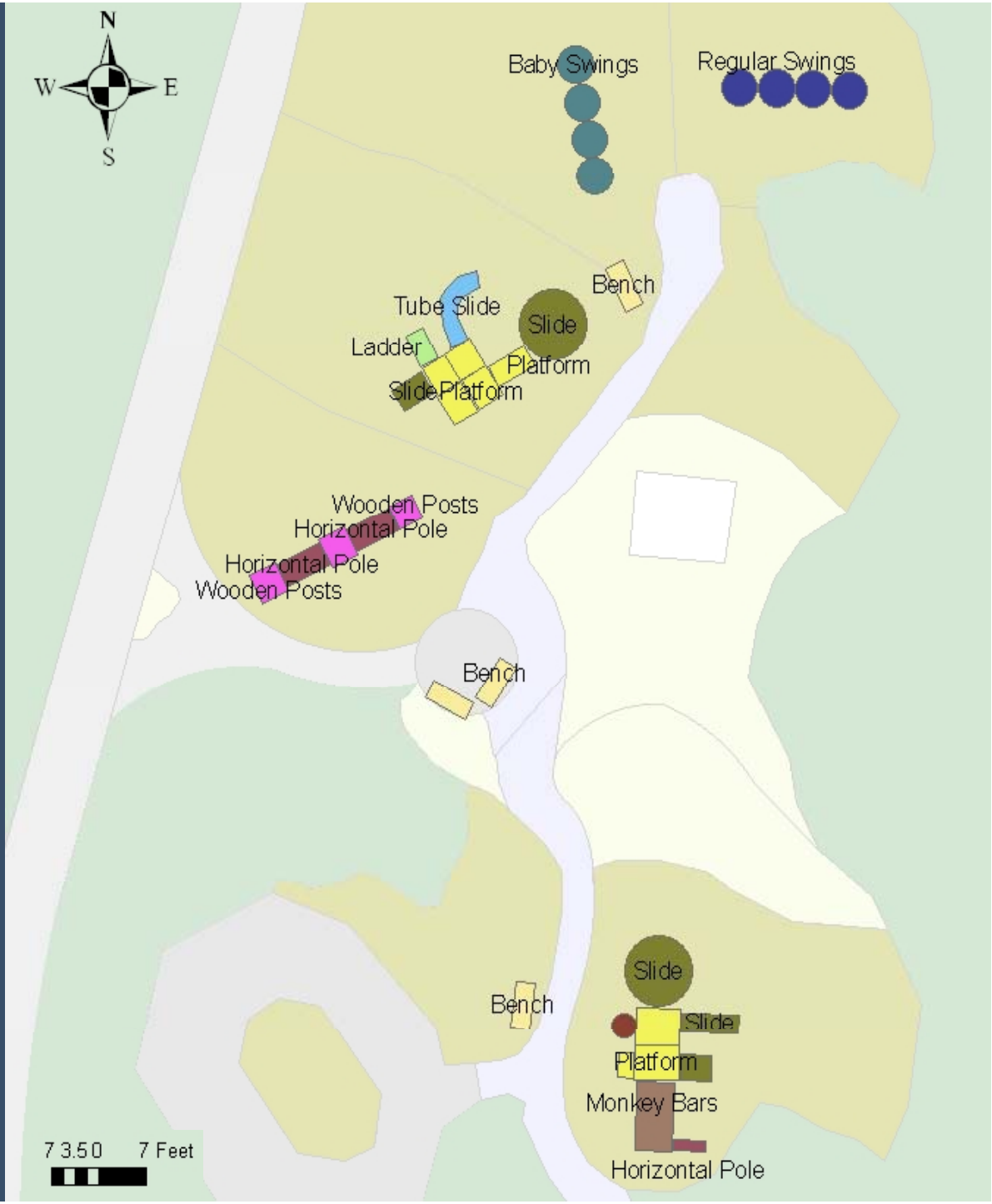
- Recruited children from a 1-mile network distance surrounding the park

- Ethnically diverse
- Mean household income: $34,190
- 16.4% households below poverty level

Casino site


Horizontal Pole
Spiral Ladder
Slide
Steps
Monkey Bars
Steps
Regular Swings
Platform
Slide
Picnic Table
Bench
Bench
Picnic Table
Bench
Baby Swings
Car on Springs
Train
Bench
Spiral Ladder
Slide
Telephone Tube
Telephone Tube
Platform
Slide
Steps
Vertical Pole
Platform
Picnic Table
Picnic Table
N
W
E
S
8 4 0 8 Feet

Lodge site


N
W
E
S
Baby Swings
Regular Swings
Bench
Tube Slide
Slide
Ladder
Platform
Slide Platform
Wooden Posts
Horizontal Pole
Horizontal Pole
Wooden Posts
Bench
Slide
Bench
Slide
Platform
Monkey Bars
Horizontal Pole
7 3.5 0
7 Feet

Methods

- One week usual physical activity
  - Accelerometry
- Scheduled one hour play period at the park
  - Friend
  - Active toys
- Standardization and control
  - Starting location
    - Different entry locations could influence activity choices
  - Park elements reviewed to assure familiarity with choices
  - Told to be active or rest as they freely choose

Methods

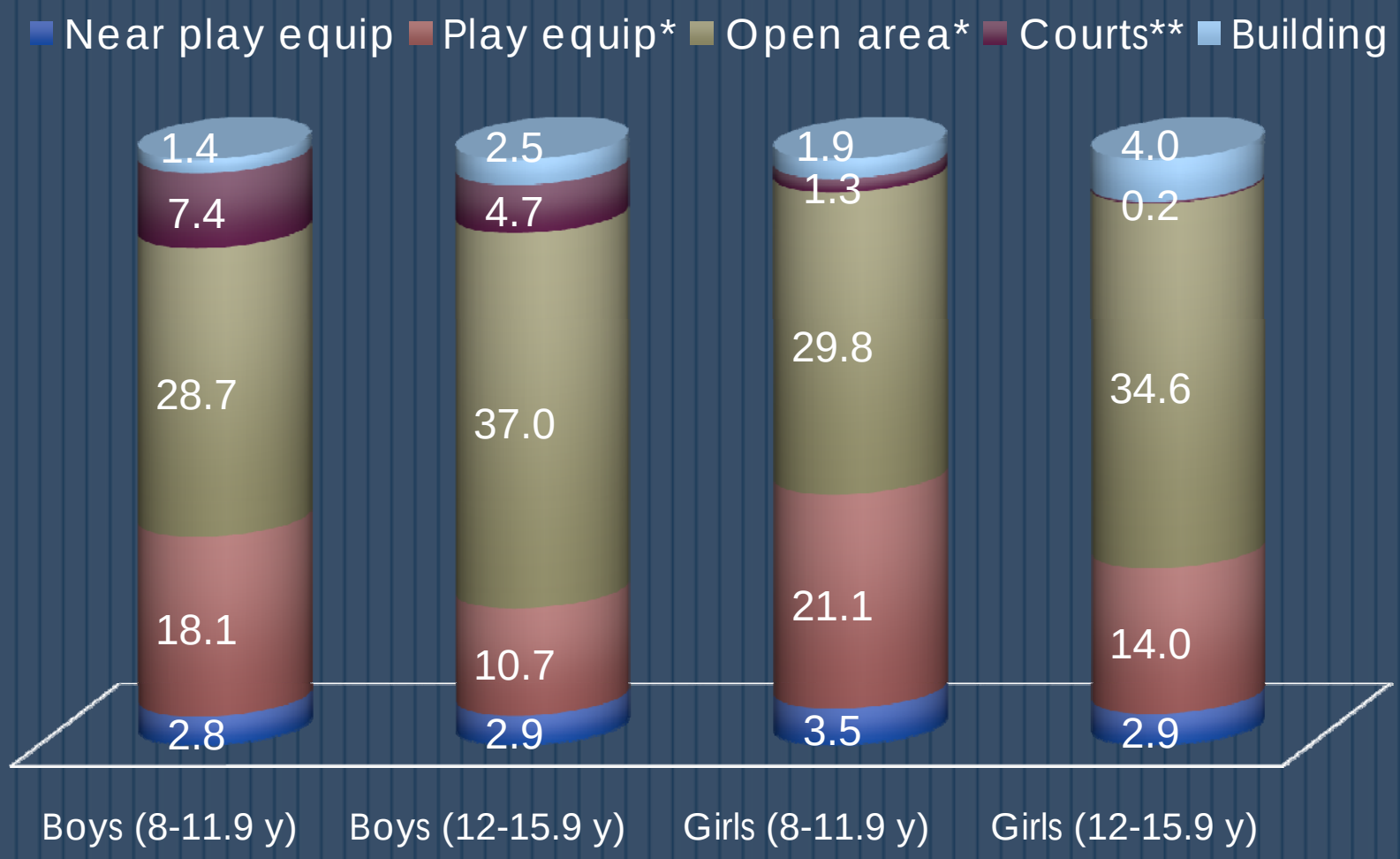
- Park elements digitized into a GIS map
- Tablet-PC observation tool designed to work within GIS
  - Behavioral maps created by placing point location markers
  - Place and activity recorded upon change in location or activity
- Physical activity intensity (METs) coded using a compendium of children's physical activities
  - Categorized as:
  - Light (<3 METs) Moderate (3 -4.9 METs)
  - Hard (5-5.9 METs) Very hard (>6 METs)
- Analytic plan
  - 2-way, age (younger, older) by gender (boys, girls) ANOVA
    - Covariates of race, income, zBMI and usual physical activity

Subject demographics

	Boys		Girls	
	8-11.9 y n = 21	12-15.9 y n = 26	8-11.9 y n = 33	12-15.9 y n = 26
Race	Black: 9 White: 9 Other: 3	Black: 6 White: 18 Other: 2	Black: 16 White: 11 Other: 6	Black: 5 White: 17 Other: 4
Income ($)	60,000 (<10K–200k)	60,000 (<10K–200k)	60,000 (<10K–200k)	60,000 (10K–180k)
Age (y)*	10.2 ± 1.0	12.1 ± 1.3	9.8 ± 1.2	13.6 ± 1.1
BMI %ile	53.3 ± 29.1	52.9 ± 29.8	56.5 ± 32.9	64.1 ± 27.1
Activity(cpm)*,**	706 ± 195	567 ± 213	580 ± 185	441 ± 141

Mean ± SD
*age effect, $P < 0.05$
**gender effect, $P<0.05$

Minutes of activity at elements



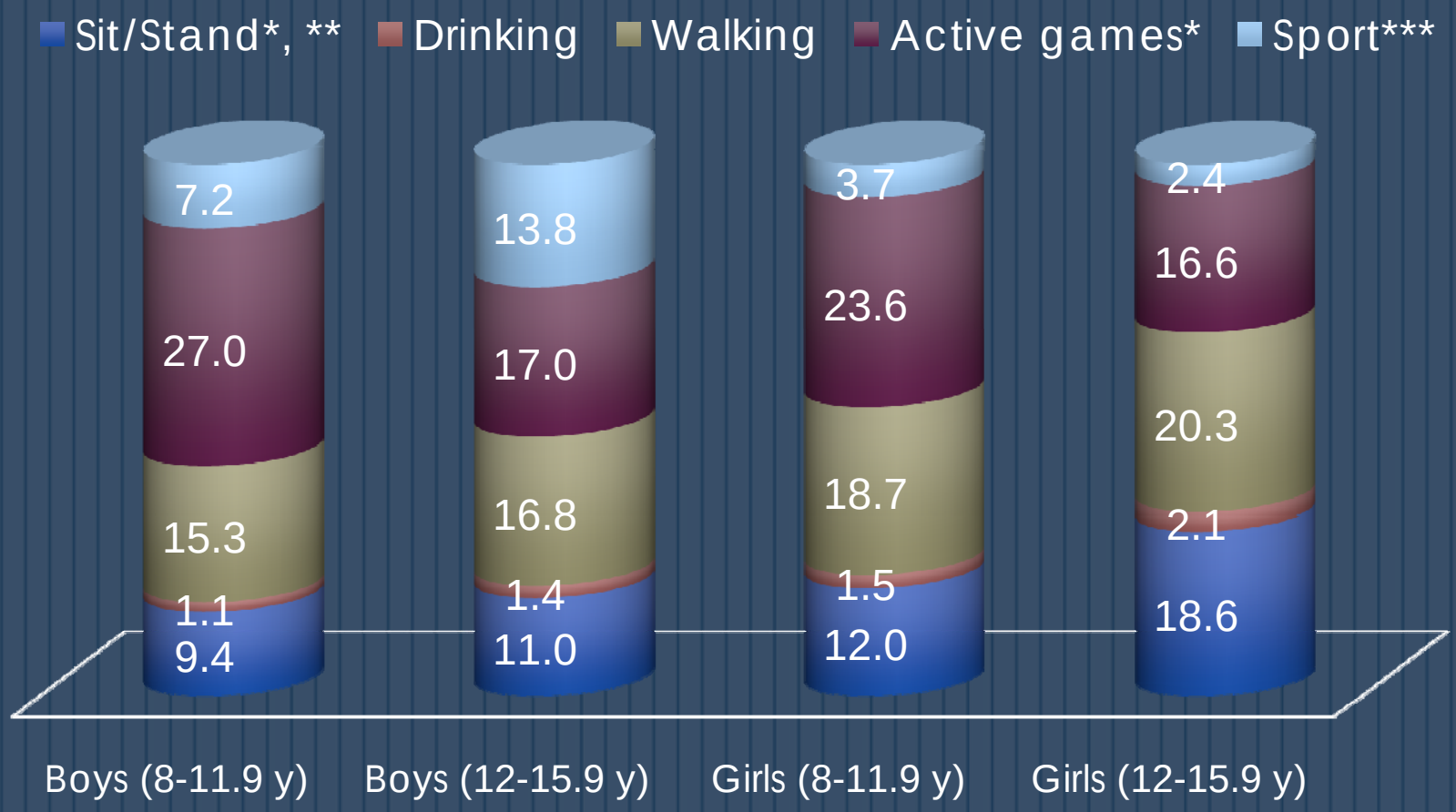
*age effect, $p < 0.05$
**gender effect, $p < 0.05$

Activity choices and Mets at elements

	Near equip	Play equip*	Open area**	Courts
Boys	Active games Sit/Stand	Playing on structure Sit/Stand	Walking Active games Sports Sit/Stand	Basketball Active games
Girls	Active games Sit/Stand	Playing on structure Sit/Stand	Walking Active games Sit/Stand Sports	Badminton Sit/Stand
Boys 8-11 y	3.5 ± 0.4	4.5 ± 0.2	3.9 ± 0.2	6.6 ± 0.9
Boys 12-15 y	2.9 ± 0.4	4.5 ± 0.2	4.5 ± 0.2	5.4 ± 1.0
Girls 8-11 y	3.4 ± 0.4	4.8 ± 0.1	4.0 ± 0.2	6.1 ± 1.3
Girls 12-15 y	3.1 ± 0.4	4.8 ± 0.1	3.4 ± 0.2	-

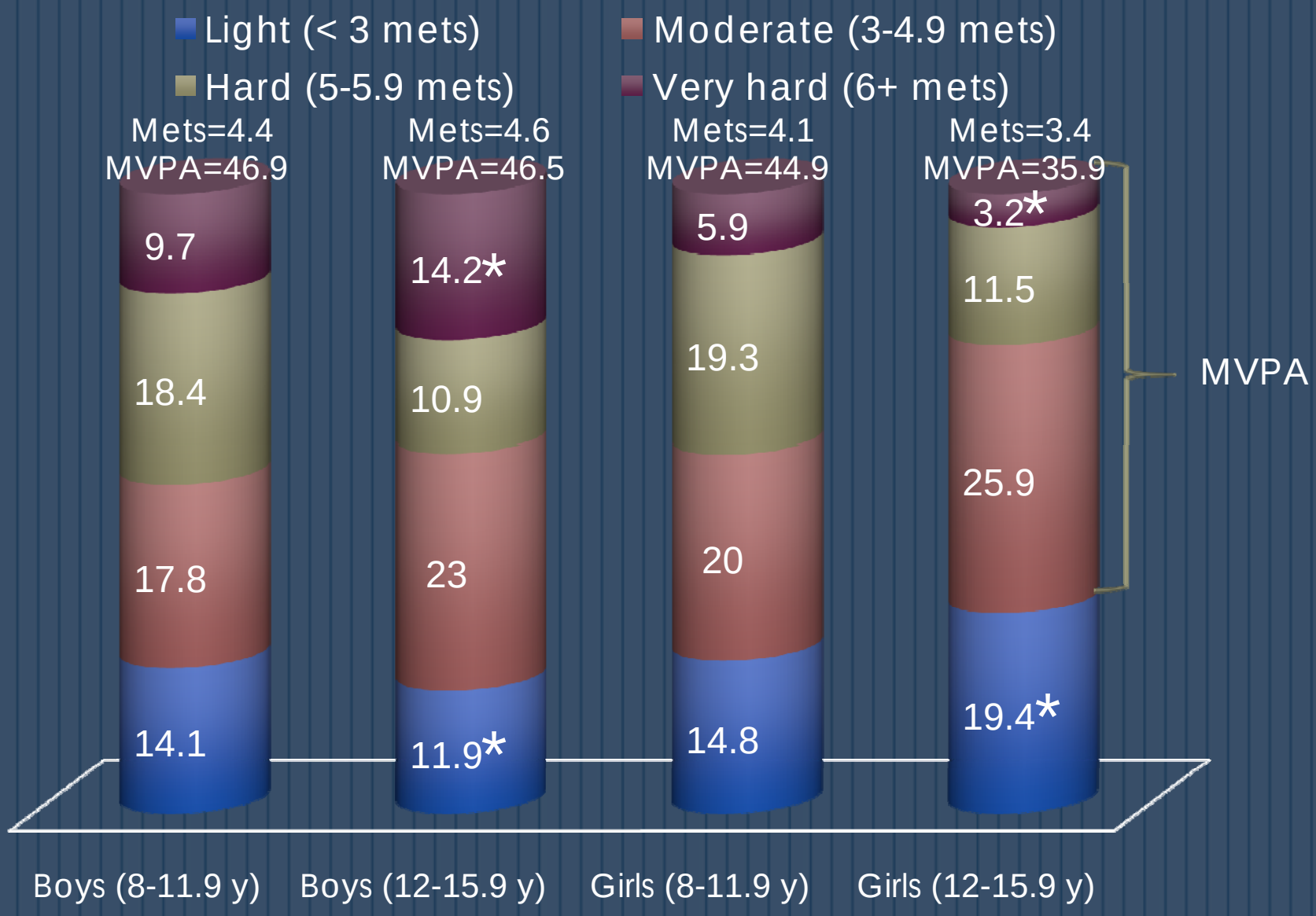
*gender effect, $p < 0.05$
**age by gender interaction, $p < 0.05$
- all differ except younger boys and girls

Minutes engaged in activities



*age effect, $p < 0.05$
**gender effect, $p < 0.05$
***age by gender interaction, $p < 0.05$
- older boys > other groups

Minutes spent at intensities



Summary & Conclusions

- Which park elements do youth choose to use to be active?
  - Younger youth: play structures & equipment, Older youth: open areas
  - Boys: courts
- Intensity of activity and duration of use of park elements?
  - All equipment and spaces promote average activity intensity ≥ MVPA
  - Older boys more & older girls less intensely active in open areas
  - Younger youth engage in more active games, older boys in sports
  - Older youth and girls are more sedentary
- How much activity do youth accrue when visiting a park for 1 hr?
  - ~45 min MVPA, older girls are less active, but still average 3.4 mets and ~35 min MVPA
- Well designed parks can help younger and older youth make large strides toward meeting the daily activity guidelines
  - 60 min/day with MVPA making-up the majority of the time

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