Before- and After-school Physical Activity Programs including Intra- and Extramural Sports: OPPORTUNITIES AND CHALLENGES

Michael W. Beets, M.Ed., M.P.H., Ph.D.
Arnold School of Public Health • University of South Carolina
Comprehensive Approach to School-wide Physical Activity Promotion

Before School

~60min/d

Active Commute To

School Day

~6-7hrs/d

Active Commute From

After school time

Afterschool Programs (ASPs)

Intramural Sports (IM)

Extramural Sports (EM)

~2-3hrs/d

Defining OST Programs
Defining OST (out-of-school time) Program Opportunities

• **Before-School**
  - **Days/Time:** M-F, ~7-8am daily
  - **Schedule:** Varies depending on program; Example: open gyms facilitating PA, breakfast, educational time, etc
  - **Population:** ??

• **ASPs**
  - **Days/Time:** M-F, 3-6pm, throughout school year
  - **Schedule:** Snack, homework assistance/tutoring, enrichment activities (e.g., arts and crafts, music) and opportunities for children to be physically active (NOT single activity or sport focused)
  - **Population:** Mostly Elementary age
Defining OST (out-of-school time) Program Opportunities

• **Intra-murals (IM)**
  • **Days/Time:** Days per week and length of program vary
    • Some programs meet 1-2 times/week; others meet daily
    • ~1 hr – 1hr 30 minutes
  • **Schedule:** Focused on sport PA, skill development, and scrimmage, all skill-level play
  • **Population:** Mostly Middle School age

• **Extra-mural (EM)**
  • **Days/Time:** M-F (typically), ~3:00 pm – 5:00 pm, School year
    • A child may only participate in a single season (e.g., football only)
    • Weekly schedule is game dependant
  • **Schedule:** Sport specific skill development, scrimmages, and competitive games – high skill, try-outs
  • **Population:** Mostly High School age
Contrasting IM vs. EM

Important Elements of IM

- **Inclusion**
  - Every student is given an equal opportunity to participate regardless of physical ability.
  - No cut policies

- **Challenge By Choice**
  - Activities are intended to be voluntary in nature, i.e., the student has a choice of activities or participation.

- **Student-Centered**
  - Students have the opportunity to be involved in the planning, organization and administration of programs. Such involvement should be age-appropriate and under the supervision and guidance of a qualified adult.
Why OST Programs?
Hours/day spent Out/Inside School and Asleep

1st – 3rd Grade

- Outside school time, 7.5hrs, 31%
- School, 7.0hrs, 29%
- Sleep, 9.5hrs, 40%

9th – 12th grade

- Outside school time, 9.0hrs, 38%
- School, 7.0hrs, 29%
- Sleep, 8.0hrs, 33%

National Sleep Foundation (2006), Education Commission of the States (www.ecs.org)
Substantial amount of PA accumulated outside of school*

*Little investigation into segmented day – pedometer derived

~59% to 63% PA Occurs outside school

TABLE 2. Pedometer-determined physical activity of sixth-grade student sample.

<table>
<thead>
<tr>
<th>Steps per day</th>
<th>Boys (N = 28)</th>
<th>Girls (N = 53)</th>
<th>Total (N = 81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>16,421 ± 5444</td>
<td>12,332 ± 3056***</td>
<td>13,746 ± 4461</td>
</tr>
<tr>
<td>Before school</td>
<td>1784 ± 948</td>
<td>1504 ± 856</td>
<td>1601 ± 893</td>
</tr>
<tr>
<td>Lunchtime</td>
<td>2521 ± 804</td>
<td>1913 ± 657****</td>
<td>2123 ± 764</td>
</tr>
<tr>
<td>Recess</td>
<td>1490 ± 638</td>
<td>1011 ± 358***</td>
<td>1177 ± 523</td>
</tr>
<tr>
<td>Physical education</td>
<td>1429 ± 567</td>
<td>1410 ± 445</td>
<td>1417 ± 487</td>
</tr>
<tr>
<td>After school</td>
<td>7805 ± 3507</td>
<td>5933 ± 2331*</td>
<td>6580 ± 2913</td>
</tr>
</tbody>
</table>

Steps per day for physical education represent 2 d of data collection vs 4 d for the rest of the variables. Significant sex differences: * P < 0.05, ** P < 0.01, *** P < 0.001, **** P < 0.0001.


Substantial amount of PA accumulated outside of school*

*Little investigation into segmented day – pedometer derived

~59% to 63% PA Occurs outside school

829 4th & 5th grade students AZ


Substantial amount of PA accumulated outside of school*

*Little investigation into segmented day – accelerometer derived

Moore, J. (unpublished data. 18 counties in NC who were Eat Smart Move More grant recipients in either 2010-2011 or 2011-2012. These data come from the baseline data collection in 2010 - >900 4th – 8th grade students NC
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Surveillance of OST Programs

Surveillance

• ASPs
  • America After 3pm Survey
  • Afterschool Alliance, Washington, DC
  • 30,000 US households
    • No questions specific to physical activity

• IM/EM
  • YRBSS and SHPPS CDC
    • YRBSS - Captures youth involvement (general sports)
    • SHPPS - Schools that offer & access
Who’s participating in OST Programs?
Participants in Before and ASPs

• Before-school - ????

• ASPs (America After pm)
  • 8.4 million k-12 (+3 million since 2004)
  • Majority Elementary age
  • 40% low-income schools
  • Avg. 8.1hrs/wk
Participants in IM and EM

- **61% NC Middle school youth org. sport**
  (Edwards, 2012)

- **44+ million org. sport (<18yrs)**
  (National Council on Youth Sports, 2008)
  - 1997: 32+ million boys and girls
  - 2000: 38+ million boys and girls

- **Youth sport participation**
  (YRBSS)
  - HS: **55.2% to 58.4%** (2001-2011)
  - Middle: **57/75% to 59/74%** (2007-2011)
## Percent Participants in Sports*

*Does not specify IM and EM*

Boys and Girls by Race/Ethnicity, YRBSS 2011 HS

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>White (%)</th>
<th>Black (%)</th>
<th>Hispanic (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>64.7</td>
<td>67.3</td>
<td>63</td>
</tr>
<tr>
<td>Black</td>
<td>57.1</td>
<td>46.9</td>
<td>44.6</td>
</tr>
<tr>
<td>Hispanic</td>
<td>57.1</td>
<td>46.9</td>
<td>44.6</td>
</tr>
</tbody>
</table>
Policies and Standards defining PA in OST Programs
Policies for Physical Activity in OST Programs

- **Formal statement that defines:**
  - Priorities for action, goals, and/or strategies, as well as accountabilities of involved actors
  - **Formal rules**
  - **Codes**
  - **Standards**
  - **Regulations**
  - **Guidelines**
  - **Benchmarks**

Policies for Physical Activity in OST Programs

• Before-school
  • None identified

• ASPs
  • 5 policies (4 related to MVPA)

• IM/EM
  • Single policy for MVPA
  • Policies/guidelines for running optimal program
    • NASPE 2001 recommendations
    • Child involvement, no-cut policies, joint use agreements, academic eligibility
### Policies for Physical Activity in OST Programs

<table>
<thead>
<tr>
<th>State</th>
<th>Requirements</th>
</tr>
</thead>
</table>
| NC    | **20%** of daily program time for MVPA (ASP)  
        **80%** of daily program time for MVPA (IM/EM) |
| KS/MO | Outline **competences for staff** related to PA promotion  
        Role models healthy behaviors, Evaluates effectiveness of PA opportunities |
| CA    | **All Children engage in minimum 30 minutes MVPA/d in ASP**  
        Up to 60 minutes MVPA/d low active kids |
| NAA   | **At least 20% or 30min of ASP schedule to PA opportunities**  
        **Provide PA children engage in MVPA at least 50% of PA time** |

**NO accountability for meeting policies/standards**
Healthy People 2020 Goals

• **PA-9** Increase the number of States with licensing regulations for physical activity provided in child care
  - **3 States** required children to engage in vigorous physical activity in 2006
  - **1 State** required a number of minutes of physical activity per day or by length of time in care in 2006

• **PA-10** Increase the proportion of the Nation’s public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations)
  - **28.8 percent** of the Nation’s public and private schools provided access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations) in 2006
How much PA do youth accumulate in these programs?
Afterschool Programs*

*Estimates based on 2,394 daily observations on 649 children (5-12yrs) attending 18 afterschool programs. Children had to attend the afterschool program a minimum of 60 minutes to be included in the estimates. Children wore ActiGraph accelerometers up to 4 consecutive days – estimates use the Evenson et al., (2008) cutpoints. Abbreviations: CA = California, MVPA = Moderate-to-vigorous physical activity; NAA = National Afterschool Association; NC = North Carolina; PA = Physical Activity. Source: Shah, R., Beets, M. W., Huberty, J., & Beighle, A. (in review). Prevalence of children meeting standards for physical activity in afterschool programs.
IM/EM Sport*

*Articles did not specify IM or EM structure to sports

Avg. MVPA 45.1 mins
46.1% practice time
200 7-14yrs olds


Figure 2. Mean moderate to vigorous physical activity (MVPA) during practice and percentage of participants meeting PA guidelines by sex. Means were calculated at the participant level; error bars represent standard deviation.
IM vs. EM Sport*

*SOPLAY percentage of boys/girls observed


Barriers to increasing PA in OST Programs
Barriers ASPs – Access & Cost
Afterschool Programs (America After 3pm Survey, 2009)

- Parents of 18 million children would enroll their child in ASP if one were available

- Cost – avg. $67/wk (increase from $44 five years ago)

- 8 of 10 parents support public funding of ASPs

- Top benefits cited by parents of ASPs:
  - Helping with social skills
  - Safety
  - Providing opportunities for physical activity
  - Academic success
Barriers ASPs – Training
Afterschool Programs

- Quality of staff training for PA
  - Survey of 39 ASPs
  - 8 received PA training from Qualified Person
  - Most conducted by “in-house” personnel

- Existing PA Trainings
  - Fail to develop core-competencies for promoting PA
  - Focus on playing specific games
  - Using pre-packaged materials


Barriers IM/EM – Access

Intramural and Extramural Sports

- **65%** of school PA areas not utilized after school
  (4 middle schools)

- **<50%** of schools offer IM
  (>90% secondary schools offer EM)

- **Joint Use Agreements**
  - 2000 to 2006 – no \( \Delta \) in access
  - Public schools more likely to provide access
  - 2 of 3 schools allowed access outdoor PA facilities

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# Barriers IM/EM – Access

Intramural and Extramural Sports

## Percentage of Schools That Offered Selected Intramural Activities or Physical Activity Clubs and Interscholastic Sports, by School Level

<table>
<thead>
<tr>
<th>Activity, Club, or Sport</th>
<th>Elementary</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intramural Activity or Physical Activity Club</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseball, softball, or whiffleball</td>
<td>27.7</td>
<td>28.0</td>
<td>22.2</td>
</tr>
<tr>
<td>Basketball 38.</td>
<td>3</td>
<td>42.4</td>
<td>37.2</td>
</tr>
<tr>
<td>Dance 15.</td>
<td>0</td>
<td>16.2</td>
<td>13.6</td>
</tr>
<tr>
<td>Frisbee, Frisbee golf, or ultimate Frisbee</td>
<td>10.8</td>
<td>15.9</td>
<td>14.5</td>
</tr>
<tr>
<td>Jump rope</td>
<td>22.9</td>
<td>19.1</td>
<td>16.2</td>
</tr>
<tr>
<td>Running or jogging</td>
<td>28.6</td>
<td>29.0</td>
<td>24.1</td>
</tr>
<tr>
<td>Soccer</td>
<td>28.6</td>
<td>27.7</td>
<td>18.8</td>
</tr>
<tr>
<td>Volleyball 24.</td>
<td>6</td>
<td>35.5</td>
<td>27.4</td>
</tr>
<tr>
<td>Walking</td>
<td>20.0</td>
<td>19.2</td>
<td>20.4</td>
</tr>
<tr>
<td><strong>Interscholastic Sport</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseball N</td>
<td>A</td>
<td>35.7</td>
<td>79.6</td>
</tr>
<tr>
<td>Basketball N</td>
<td>A</td>
<td>76.4</td>
<td>90.9</td>
</tr>
<tr>
<td>Bowling</td>
<td>NA</td>
<td>3.0</td>
<td>17.2</td>
</tr>
<tr>
<td>Cheerleading or competitive spirits</td>
<td>NA</td>
<td>50.9</td>
<td>77.3</td>
</tr>
<tr>
<td>Cross-country</td>
<td>NA</td>
<td>38.9</td>
<td>68.4</td>
</tr>
<tr>
<td>Fast pitch or slow pitch softball</td>
<td>NA</td>
<td>45.2</td>
<td>77.9</td>
</tr>
<tr>
<td>Football N</td>
<td>A</td>
<td>53.0</td>
<td>71.0</td>
</tr>
<tr>
<td>Ice hockey</td>
<td>NA</td>
<td>2.4</td>
<td>14.3</td>
</tr>
<tr>
<td>Track and field</td>
<td>NA</td>
<td>52.1</td>
<td>73.2</td>
</tr>
<tr>
<td>Volleyball N</td>
<td>A</td>
<td>57.3</td>
<td>71.4</td>
</tr>
<tr>
<td>Wrestling</td>
<td>NA</td>
<td>28.7</td>
<td>49.6</td>
</tr>
</tbody>
</table>

NA = not asked.
Barriers IM – Costs

Intramural Sports

- 35% of schools require $$ fee for IM (86% waived fee)

- IM fee free to $45

Program Cost Considerations

- Supervision: Coaches, Facilitators, EM/IM director, board (IM advisor – PE teacher/coach)
- Facilities: School setting or community – available resources
- Equipment: Schools should have adequate equipment
- Transportation: to and from program location if needed
- Officials (hired staff, volunteers, or students)

- Of all schools w/ IM (<50%)
  - 54% pay staff to supervise IMs
Barriers EM – Costs

Extramural Sports

- Pay-to-Play fees
  - >800 Mid/HS students
  - 43% play sports
- 61% pay-to-play fee
- Avg. $93
  - 21% kids >$150
  - 6% waivers
- Add. Team fees avg. $381 (equipment, transportation, etc...)

Pay-to-Play Sports Keeping Lower-Income Kids Out of the Game

School budget challenges have resulted in deep funding cuts for middle and high school sports. In response, many school districts now charge fees for athletic participation. These “pay-to-play” fees are a flat charge per year or per number of sports; parents often pay additional team fees, as well as other costs such as equipment and transportation. There is little information about how increasing the cost of school sports for families may affect participation.

In January 2012, the C.S. Mott Children’s Hospital National Poll on Children’s Health asked a national sample of parents of children in middle or high school (age 12-17 years) about participation in and costs of school sports.

Costs of School Sports
Overall, 43% of parents report that their child participates in school sports. A school pay-to-play fee was charged for 61% of sports participants. The average fee was $83, but 21% of children faced a pay-to-play fee of $150 or more. Six percent of children who play school sports received waivers for the pay-to-play fees. Importantly, pay-to-play fees are only one component of the school sports costs reported by parents. Including additional team fees and other costs, the average cost for sports participation was $381.

Participation in School Sports by Family Income
Substantial differences in school sports participation are seen based on household income. Among lower-income families, only one-third have a teen playing school sports; in comparison, among families earning $80,000 per year, more than half have a teen playing school sports (Figure 1).

Overall, 12% of parents report that the cost of school sports has caused a decrease in participation for at least one of their children. However, nearly 1 in 5 parents in lower-income households report a decrease in their child’s sports participation—a much bigger decrease than their higher-income peers (Figure 1).
Figure 1. Participation in School Sports for Kids 12-17 Years, by Household Income

- **Household Income < $60,000**
  - 19% decreased participation due to cost
  - 34% currently participate

- **Household Income ≥ $60,000**
  - 51% currently participate
  - 5% decreased participation due to cost

Does participation in OST programs lead to other beneficial outcomes?
### ASPs: Personal and Social Skills

Durlak and Weissberg (2007) The Impact of After-school Programs that promote personal and social skills

#### Table 3: Mean Effects for Different Outcomes in Participating Youth

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Mean Effect Size</th>
<th>N</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings and Attitudes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child self-perceptions</td>
<td>0.34*</td>
<td>22</td>
<td>0.23-0.45</td>
</tr>
<tr>
<td>School bonding</td>
<td>0.14*</td>
<td>28</td>
<td>0.03-0.25</td>
</tr>
<tr>
<td>Indicators of Behavioral Adjustment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive social behaviors</td>
<td>0.19*</td>
<td>35</td>
<td>0.10-0.28</td>
</tr>
<tr>
<td>Problem behaviors</td>
<td>0.18*</td>
<td>42</td>
<td>0.10-0.26</td>
</tr>
<tr>
<td>Drug use</td>
<td>0.11*</td>
<td>27</td>
<td>0.01-0.21</td>
</tr>
<tr>
<td>School Performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement tests</td>
<td>0.16*</td>
<td>20</td>
<td>0.05-0.27</td>
</tr>
<tr>
<td>School grades</td>
<td>0.11*</td>
<td>25</td>
<td>0.01-0.22</td>
</tr>
<tr>
<td>School attendance</td>
<td>0.10</td>
<td>21</td>
<td>-0.01-0.20</td>
</tr>
</tbody>
</table>

* Denotes mean effect is significantly different from zero at the .05 level
Does Participation in IM predict Adult PA?

- 1,293 youth (Montreal, Canada)
- Self-report of OST program
- 7-d recall Weekly Activity Checklist
  - Collected every 3 months

Does Participation in EM predict Adult PA?

- 1,293 youth (Montreal, Canada)
- Self-report of OST program
- 7-d recall Weekly Activity Checklist
  - Collected every 3 months

Figure 2. Total Unadjusted Physical Activity (PA) Sessions per Week From Ages 12-13 to 20 for Students in High and Low Extramural Schools (NDIT Study, 1999-2007)

Does participation in OST programs influence BMI gain?

(Dunton et al., 2012)

- Children's Health Study
- N = 4550
- 4yrs to 12yrs
- BMI measured annually
- Baseline OST participation

"Has your child taken any of the following exercise classes, lessons, or special programs during that past 12 months (outside of school only)?" Responses: dance, aerobics, gymnastics or tumbling, martial arts, other, and none of the above
Does participation in OST programs influence BMI gain?

(Dunton et al., 2012)

- **Children's Health Study**
- **N = 4550**
- **4yrs to 12yrs**
- **BMI measured annually**
- **Baseline OST participation**

"Since September of this school year, has your child played outdoors in any organized team sports at least twice per week?"

Examples: baseball/softball/T-ball, soccer, swimming, basketball, football, tennis, volleyball, skating/roller blading, track/field, golf, and other
Conclusions

- OST represents extended period where children can be active

- Various programs where kids can be involved
  - Potential to promote $\frac{1}{2}$ to all of MVPA recommendation

- Clarity identifying and evaluating programs
Conclusions

• Increase surveillance of PA in well-defined OST programs

• How to increase access to IM/EM?

• Accountability to policies/standards
Thank you