PHYSICAL ACTIVITY DURING RECREATION YOUTH SPORT: DOES COACH TRAINING HAVE AN INFLUENCE?

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7/23/15
Presentation Overview

- Research Study
  - Background
  - Methods
  - Results
  - Discussion
  - Conclusion

- Field Experience Report
  - Introduction
  - Methods
  - Results
  - Conclusion
Background

- NHANES data indicates 42% of 6-11 year olds and 8% of 12-15 year-olds are meeting guidelines (Troiano et al., 2008)
60 Minutes or More a Day
Where Kids Live, Learn, and Play

Physical activity is critical for overall health.

Learn more: www.health.gov/paguidelines

• Physical Activity Settings: Physical Education (PE)
  – Guidelines ≥ 50% MVPA (USDHHS, 2008)
  – Typical PE class ≤ 50% (USDHHS, 2008)
• Physical Activity Settings: Youth sport (YS)  

  – 44 million children in the US participate in youth sport  
    National Council of Youth Sports, 2008)
FIGURE 2—Contribution of youth sport, PE, recess, and unstructured activity to total daily MVPA.

(Wickel & Eisenmann, 2007)
FIGURE 5—Distribution of sedentary, light, moderate, and vigorous physical activity on a sport and nonsport day ($N = 36$). * Significant difference between sedentary, moderate, and vigorous activity ($P < 0.05$).
Physical activity levels during youth sport

– Almost half of time is spent in sedentary or light PA (Guagliano, Rosenkranz, & Kolt, 2013; Leek et al., 2011; Sacheck et al., 2011; Van Den Berg & Kolen, 2015; Wickel & Eisenmann, 2007)

– 30-53% of time has been shown to be spent in MVPA depending on sport or game context (A. Cohen, McDonald, McIver, Pate, & Trost, 2011; Guagliano et al., 2013; Leek et al., 2011; Sacheck et al., 2011; Van Den Berg & Kolen, 2015; Wickel & Eisenmann, 2007)
• Coaches are the primary leader of the youth sport setting and have the potential to influence child’s PA during the session

• Recreation program coaches are often volunteers with little or no coaching experience  
  (Conroy & Coatsworth, 2006; Seefeldt & Ewing, 1997)
• Objectives

1. Report PA levels during practice time for parks and recreation youth flag football participants

2. Compare youth PA levels between teams with trained coaches versus untrained coaches, and between teams with experienced coaches versus inexperienced coaches
• Hypothesis

1. Children would spend less than 50% of flag football practice time in MVPA
2. Coaches who had received prior coach training or had prior experience coaching football would conduct practices that resulted in higher MVPA than untrained or inexperienced coaches
Methods

• Setting
  – Parks and Recreation program in Manhattan, Kansas
  – All flag football teams enrolled in the 1st/2nd grade or 3rd/4th grade program during the fall of 2014 were eligible to participate (24)
  – 15 coaches volunteered for participation
Recruitment and Consent Flow Chart

24 1st/2nd, 3rd/4th grade teams invited to participate (n=216)

15 teams volunteered for participation (n=135)

1 Team excluded (n=9)

7 1st/2nd teams Returned consent (n=61)

7 3rd/4th teams Returned consent (n=52)

Did not return consent (n=14)

Female excluded (n=1)

14 total teams Returned consent (n=112)

1 child absent from observations (n=1)

Included in analysis (n=111)
• Measures: Physical Activity

  – Assessed by Actigraph GT1M accelerometer
    (ActiGraph; Pensacola, FL; Cain, Sallis, Conway, Van Dyck, & Calhoon, 2013; Trost, Mciver, & Pate, 2005)
  – 15 second epochs (Cain et al., 2013; Trost et al., 2005)
  – Evenson cutpoint (Evenson, Catellier, Gill, Ondrak, & McMurray, 2008)

    • sedentary (≤ 100 counts per minute, (CPM))
    • light (101-2295 CPM),
    • moderate (2296-4011 CPM)
    • and vigorous (≥4012 CPM)
Methods

• Measurement-Physical Activity
  – PA assessed from schedule practice start time until practice completion
  – All boys arriving within 30 minutes of practice start time were included in analysis
Methods

• Measures-Classification of coach training and experience
  – Short Survey
    • Coach training
      – A degree related to coaching
      – Coach certification
      – Coach training workshop
      – National Youth Sport Coaching Association (NYSCA)
Methods

– Coach experience
  • Coached football at least once prior to the current season (any level)
    – Includes school competitive, non-school affiliated competitive, or recreation
Procedure

• Data collection
  – Attended 3 practices for each team
  – Placed accelerometers on kids as they arrived
  – Took accelerometers off as they left
Statistical Analysis

• Three-level model (team, time, child)
• Examined coach experience and training on PA responses
• Team, Team*Day, and Child as random effects
Statistical Analysis

• Performed 3 separate comparisons
  – Trained, untrained
  – NYSCA training, No NYSCA training
  – Experience, no experience
## Results

<table>
<thead>
<tr>
<th>Prior Coaching Experience, % (n)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Prior coaching football</td>
<td>71.4 (10)</td>
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<tr>
<td>Prior coaching non school competitive</td>
<td>21.4 (3)</td>
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<tr>
<td>Prior coaching school competitive</td>
<td>21.4 (3)</td>
</tr>
<tr>
<td>Prior coaching recreation/non-competitive</td>
<td>42.9 (6)</td>
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<tr>
<td>No prior coaching</td>
<td>14.3 (2)</td>
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<thead>
<tr>
<th>Prior Coach Training, % (n)</th>
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<tr>
<td>Coaching Certification</td>
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<td>Coaching Workshop</td>
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<tr>
<td>NYSCA</td>
<td>50.0 (7)</td>
</tr>
<tr>
<td>No Training</td>
<td>28.6 (4)</td>
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</tbody>
</table>
Results

- Practice duration
  - 27 to 90 minutes with a mean of 61.5 (SD = 8.6)

<table>
<thead>
<tr>
<th></th>
<th>% (SE)</th>
<th>Min (SE)</th>
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<tbody>
<tr>
<td>Sedentary</td>
<td>13.0 (1.1)</td>
<td>7.7 (0.5)</td>
</tr>
<tr>
<td>MVPA</td>
<td>34.0 (1.5)</td>
<td>19.9 (1.2)</td>
</tr>
<tr>
<td>VPA</td>
<td>12.0 (0.8)</td>
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</table>
## Results

Least Squares Means estimate of sedentary, MVPA, and VPA percentage and minutes of practice time by coach characteristic

<table>
<thead>
<tr>
<th>Coach Characteristic</th>
<th>%</th>
<th>%</th>
<th>$p$-value</th>
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<tbody>
<tr>
<td></td>
<td>Training</td>
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<tr>
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<td>14.4</td>
<td>11.1</td>
<td>0.17</td>
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<tr>
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<td>35.9</td>
<td>0.50</td>
</tr>
<tr>
<td>VPA</td>
<td>11.3</td>
<td>12.1</td>
<td>0.68</td>
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<td>14.2</td>
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<tr>
<td>MVPA</td>
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<tr>
<td>VPA</td>
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<td>10.7</td>
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<tr>
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<td>MVPA</td>
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<tr>
<td>VPA</td>
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# Results

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</tr>
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Discussion

• Hypothesis 1
  – Children would spend less than 50% time in MVPA
    • Supported

• Hypothesis 2
  – Trained or Experienced coaches would conduct practices resulting in higher MVPA than untrained or inexperienced coaches
    • Not supported
Public Health Impact

YS contributed ~20 minutes MVPA
**Table 3:** Least Squares Means estimate of sedentary, MVPA, and VPA percentage and minutes of practice time by coach characteristic

<table>
<thead>
<tr>
<th>Coach Characteristic (n)</th>
<th>Sedentary Mean (SE)</th>
<th>MVPA Mean (SE)</th>
<th>VPA Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Min</td>
<td>%</td>
</tr>
<tr>
<td>All Teams (14)</td>
<td>13.0 (1.1)</td>
<td>7.7 (0.5)</td>
<td>34.0 (1.5)</td>
</tr>
<tr>
<td>Overall Trained (10)</td>
<td>14.4 (1.4)</td>
<td>8.7 (0.6)</td>
<td>33.3 (2.0)</td>
</tr>
<tr>
<td>No Training (4)</td>
<td>11.1 (1.9)</td>
<td>6.6 (0.7)</td>
<td>35.9 (3.3)</td>
</tr>
<tr>
<td>NYSCA Training (7)</td>
<td>14.0 (1.8)</td>
<td>8.0 (.8)</td>
<td>34.7 (2.4)</td>
</tr>
<tr>
<td>No NYSCA Training (7)</td>
<td>14.2 (2.1)</td>
<td>8.5 (.9)</td>
<td>32.7 (2.4)</td>
</tr>
<tr>
<td>Coach Experience (10)</td>
<td>13.8 (1.5)</td>
<td>8.4 (0.7)</td>
<td>34.1 (2.0)</td>
</tr>
<tr>
<td>No Prior Coach Experience (4)</td>
<td>12.9 (2.1)</td>
<td>7.5 (1.0)</td>
<td>33.8 (3.0)</td>
</tr>
</tbody>
</table>

MVPA=moderate to vigorous physical activity; SE=standard error, NYSCA=National Youth Sport Coaching Association
Public Health Impact

YS contributed ~7 minutes
Public Health Impact

- VPA has been associated with inverse relationships of waist circumference, fat mass, SBP, and BMI (Carson et al., 2014; Steele, Van Sluijs, Cassidy, Griffin, & Ekelund, 2009)
- 7-15 minutes per day suggested to receive benefits (Hay et al., 2012; Martinez-Gomez et al., 2010)
Public Health Impact

• No recommendations exist for youth sport for MVPA
• Youth sport flag football contributed ~34%.
• If bumped up to 50%, could contribute an extra 10 minutes of MVPA per practice
Relationship to Other Research

A. Cohen et al., 2011

• Similar age group (5-10y)
  – Spent higher time sedentary (24%), higher MVPA (36.8%)
  – Used similar accelerometer methods (Evenson cutpoints)
  – Different sport (soccer)
    • shown to have higher MVPA than flag football (Wickel and Eisemann, 2007)
Relationship to Other Research

- 1 other study has examined Flag Football PA levels (Wickel & Eisenmann 2007)
- Found more time spent in vigorous (11min), and MVPA (28 min)
- Difficulty in comparing due to reporting units and accelerometer methods
  - Start/Stop times
  - Epoch length
  - Cutpoints
Importance of Training

• Recreation YS sport coaches are volunteers, often with little to no training
• Training to increase MVPA has shown success with settings that are not youth sport/people that do not have experience with teaching PE
Importance of Training

Training has been successful in:

• PE
  – Spark (Sallis et al., 1997)

• Youth Sport
  – Basketball Camp (Guagliano et al, 2014)

• After school
  – HOP’N After School (Dzewaltowski et al., 2010)
  – LET US Play (Weaver et al., 2014)
Limitations

• Small sample size
• Limited generalizability across other flag football programs
Strengths

• High participation rate (91% across all teams)
• Object measurement of PA
• Rigorous definition of practice start and stop time
Recommendations for Future Research

• Focus on physical activity as a primary outcome for coach training interventions
• Determine which coach training strategies in youth sport lead to increased MVPA without compromising other positive outcomes
Conclusion

- Youth sport contributes to children’s daily MVPA (20 min)
- Room for improvement (goal of 50%)
- Current training programs showed no difference in PA levels
- Further research is needed to identify strategies to train volunteer coaches
References


Field Experience Report: A Food Waste Assessment of Two Elementary Schools
Background: Research and Extension

- Established in 1914
- Partners with the land grant university
- Brings education on agriculture and health to communities
KSU Research and Extension
5 Challenges

Global Food Systems

Water
Health
Community Vitality
Developing Tomorrow’s Leaders
Background: The Food Waste Problem

The Food Waste Chain

- Production losses
- Post-harvest handling/storage
- Processing/packaging
- Distribution/retail
- Consumer losses
Background: The Food Waste Problem

- 133 billion lbs., $16.1 billion wasted in 2010 at the retail/consumer level (Buzby, Wells, & Hyman, 2014)
- 387 billion calories per day (Buzby, Wells, & Hyman, 2014)
- 96% ends up in landfills (Buzby, Wells, & Hyman, 2014)
- Decomposing food accounts for 20% of methane gas emissions (EPA, 2014)
Background: The Food Waste Problem

- USDA + EPA US Food Waste Challenge
- One target is schools
  - 29-43% of food taken is wasted (J. F. W. Cohen, Richardson, Parker, Catalano, & Rimm, 2014)

U.S. Food Waste Challenge
Reduce, Recover, Recycle

USDA Activity Form

Name of School:

City, State:

Website:

What activities will the school undertake in the next year? (Check all that apply.)

- Program to reduce the amount of excess food generated in the school
- Recover wholesome food from breakfasts and/or lunches to donate to feed people
- Recover food waste from breakfasts and/or lunches to feed animals
- Recover food waste from breakfasts and/or lunches for composting
- Recover food waste from breakfasts and/or lunches for energy generation or other uses
- Other
Methods

• Participants: 2 Elementary Schools
  – Manhattan Catholic School
    • Serves children pre-k to 8th grade
    • Places food orders and cooks food in house
  – Lee Elementary Feeding Site
    • Qualifies as a summer feeding site for USD-383
    • Serves food in house, has food cooked and delivered at USD 383 central kitchen
Methods

• Observation
  – Separate plate waste into 5 categories
    • Sharing table items
    • Liquids (milk)
    • Recycling
    • Food waste
    • Remaining trash
Methods

• Observation
  – Throughout lunch period, weigh and record amounts in each category
  – Record # of kids served

• Smarter Lunchroom Assessment (SLA) (Just & Wansink, 2009)
  – Questions to pertaining to behavioral economics techniques
Since its founding in 2009, the Smarter Lunchrooms Movement has championed the use of evidence-based, simple low- and no-cost changes to lunchrooms which can simultaneously improve participation and profits while decreasing waste. This tool can help you evaluate your lunchroom, congratulate yourself for things you are doing well and identify areas of opportunity for improvement.

Instructions

Read each of the statements below. Visualize your cafeteria, your service areas and your school building. Indicate whether the statement is true for your school by checking the box to the left. If you believe that your school does not reflect the statement 100% do not check the box on the left. After you have completed the checklist, tally all boxes with check marks and write this number in the designated area on the back of the form. This number represents your school’s baseline score. The boxes which help you check are areas of opportunity for you to consider implementing in the future. We recommend completing this checklist annually to measure your improvements!

Important Words

Service areas: Any location where students can purchase or are provided with food
Dining areas: Any location where students can consume the food purchased or provided
Grab and Go Meals: Any meal with components pre-packaged together for ease and convenience – such as a brown bag lunch or “Fun Lunch” etc.
Designated Line: Any food service line which has been specified for particular food items or concepts - such as a pizza line, deli line, salad line etc.
Alternative entrée options: Any meal component which could also be considered an entrée for students - such as the salad bar, yogurt parfait, vegetarian/vegan or child options etc.
Reimbursable “Combo Meal” pairings: Any reimbursable component available independently on your foodservice lines which you have identified as a part of a promotional complete meal – For example you decided your beef taco, seasoned beans, frozen strawberries and 1% milk are part of a promotional meal called “Mi Amigo Meal” etc.
Non-functional lunchroom equipment: Any items which are either broken, awaiting repair or are simply not used during meal service – such as empty or broken steam tables, coolers, registers etc.
Good Rapport: Communication is completed in a friendly and polite manner
All Points of Sale: Any location where a register/pin-pad is located for example: deli line, snack window, a la carte line, hot line, kiosks/carts etc.

Focusing on Fruit

- At least two types of fruit are available daily
- Sliced or cut fruit is available daily
- Fruit options are not browned, bruised or otherwise damaged
- Daily fruit options are given creative, age-appropriate names
- Fruit is available at all points of sale (deli-line, snack windows, a la carte lines etc.)
- Daily fruit options are available in at least two different locations on each service line
- At least one daily fruit option is available near all registers (if there are concerns regarding edible peel, fruit can be bagged or wrapped)
- Whole fruit options are displayed in attractive bowls or baskets (instead of cutting and placing in a pan)
- A mixed variety of whole fruits are displayed together
- Daily fruit options are easily seen by students of average height for your school
- Daily fruit options are bundled into all grab and go meals available to students
- Daily fruit options are written legibly on menu boards in all service and dining areas

Promoting Vegetables & Salads

- At least two types of vegetable are available daily
- Vegetables are not wilted, browning, or otherwise damaged
- At least one vegetable option is available in all foodservice areas
- Individual salads or a salad bar is available to all students
- The salad bar is highly visible and located in a high traffic area
- Self-serve salad bar utensils are at the appropriate portion size or larger for all fruits and vegetable offered
- Self-serve salad bar utensils are smaller for cutouts, dressing and other non-produce items
- Daily vegetable options are available in at least two different locations on each service line
- Daily vegetable options are easily seen by students of average height for your school
- A daily vegetable option is bundled into grab and go meals available to students
- A default vegetable choice is established by pre-plating a vegetable on some of the trays

Available vegetable options have been given creative or descriptive names
All vegetable names are printed/legible on name-cards or product IDs and displayed next to each vegetable option daily
All vegetable names are written and legible on menu boards
All vegetable names are included on the published monthly school lunch menu

Moving More White Milk

- All beverage coolers have white milk available
- White milk is placed in front of other beverages in all coolers
- White milk carte is placed so that they are the first beverage option seen in all designated milk coolers
- White milk is available at all points of sale (deli-line, snack windows, a la carte lines etc.)
- White milk represents at least 1/3 of all visible milks in the lunchroom
- White milk is easily seen by students of average height for your school
- White milk is bundled into all grab and go meals available to students as the default beverage
- White milk is promoted on menu boards legibly
- White milk is replenished so all displays appear “full” continually throughout meal service and after each lunch period

Entrée of the Day

- A daily entrée option has been identified to promote as a “targeted entrée” in each service area and for each designated line (deli-line, snack windows, a la carte lines etc.)
- Daily targeted entrée options are highlighted on posters or signs
- Daily targeted entrée is easily seen by students of average height for your school
- Daily targeted entrées have been provided creative or descriptive names
- All targeted entrée names are printed/legible on name-cards or product IDs and displayed next to each respective entrée daily

(Just & Wansink, 2009)
Results

• Manhattan Catholic
  – 10 Observation Days
  – 897 lbs. of food waste
  – 25 gallons of milk
  – ~1/3^{rd} lb. and 1.2 ounces of milk per child per day
Results

• Lee Summer Feeding Site
  – 9 observation days
  – 480 lbs. of food
  – 26 gallons of milk
  – ~1/4lb of food and 2oz of milk per child per day
Results

• Lee Feeding Site
  – Sharing table
    • 115 chocolate milk
    • 46 white milk
    • 12 bananas
    • 11 bags of carrots
    • 14 apples
    • 39 packets of sauce
  – 90 lbs recyclable

– SLA Results
  • <30
Strategies to Decrease Plate Waste

- Extend lunch period
- Move recess before lunch
- SLA strategies

- Donating food
- Composting
- Recycling
Conclusion

• Food waste is a problem in schools
• Policies need to be put in place to attempt to decrease plate waste, and redirect waste from landfills
References


Acknowledgements

• Dr. David Dzewaltowski
• Dr. Ric Rosenkranz
• Dr. Brandon Irwin

• Manhattan Parks and Recreation

• Virginia Barnard
• Dr. Michael Cates
• Barta Stevenson
Questions?
Food Waste
In a Manhattan, Kansas Elementary Lunchroom

- In the US almost 31% of the food supply went uneaten in 2010.
- 96% of this waste ends up in landfills.

In Manhattan 1 School 10 Lunch Periods

897 25
Pounds of Food Waste Gallons of Milk Waste

Estimation for 1 year

16,684 465 lbs gals

1/3 lb + 1.2 oz per child per day

Price of 1 Lunch $3.40
Supplemental Slide

Food Waste
In a summer feeding program

In the US almost 31% of the food supply went uneaten in 2010

In Manhattan

408 Pounds of Food Waste
26 Gallons of Milk Waste
90 Pounds of Recycling

115 UNOPENED
11 bags of carrots

12 unpeeled bananas

46 UNOPENED
white milk 1/2 pints

14 whole apples

The project. Over the span of two weeks, food waste was collected and weighed in one Manhattan, Kansas elementary school.

96% of this waste ends up in landfills

USDA Economic Research Service
Environmental Protection Agency
Supplemental Slide

Reducing Plate Waste
What Manhattan Schools Can Do

Assess
Perform a Food Waste Assessment to discover where the waste is coming from.

Decrease Waste
Incorporate strategies to decrease the amount of food wasted.

Redirect
Redirect waste from landfills. Separate excess food, trash, and recyclables. Donate pre-packaged food, send food scraps to compost, and recycle.

Assess
Assess What is Being Wasted and Where it Comes From
- Record all sources of food waste
- Separate lunchroom waste into 4 categories: Food, Recycle, Donate, Trash
- Weigh the pounds of waste in each category to give you an insight of what is being wasted

Decrease Waste
Incorporate Strategies Suggested by the USDA
- Hold recess before lunch
- Ensure lunch periods are at least 30 minutes
- Become a ‘Smarter Lunch Room’

Redirect Waste
Set a School Goal with the USDA
- Create sharing table within the lunch room for left over, packaged food, or donate it to the Flint Hills Breadbasket
- Separate waste into different categories, such as unopened food, food scraps, recyclables, and trash.
- Compost food scraps
### Supplemental, CI

<table>
<thead>
<tr>
<th>Physical Activity Intensity</th>
<th>% time (95% Confidence Interval)</th>
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<tbody>
<tr>
<td>Sedentary</td>
<td>13% (95% CI = 10.8%, 15.2%)</td>
</tr>
<tr>
<td>MVPA</td>
<td>34% (95% CI = 31.1%, 36.9%)</td>
</tr>
<tr>
<td>VPA</td>
<td>12% (95% CI = 10.4%, 13.6%)</td>
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</table>
## Supplemental: Child Characteristics

<table>
<thead>
<tr>
<th>Participants, n</th>
<th>111</th>
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</thead>
<tbody>
<tr>
<td>Age, Years (SD)</td>
<td>7.9 (1.2)</td>
</tr>
<tr>
<td>Free or reduced lunch status, % (n)</td>
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<tr>
<td>Not eligible</td>
<td>71.2 (74)</td>
</tr>
<tr>
<td>Free/Reduced</td>
<td>25.0 (26)</td>
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<tr>
<td>Do Not Know</td>
<td>3.6 (4)</td>
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<tr>
<td>Race/Ethnicity, % (n)</td>
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</tr>
<tr>
<td>Non-Hispanic Caucasian</td>
<td>77.7 (80)</td>
</tr>
<tr>
<td>Racial/Ethnic minority</td>
<td>22.3 (23)</td>
</tr>
<tr>
<td>Parent Race/Ethnicity, % (n)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Caucasian</td>
<td>81.6 (84)</td>
</tr>
<tr>
<td>Racial/ethnic minority</td>
<td>18.4 (19)</td>
</tr>
<tr>
<td>Parent Gender, % (n)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>43.9 (47)</td>
</tr>
<tr>
<td>Male</td>
<td>56.1 (60)</td>
</tr>
<tr>
<td><strong>Mother Education, % (n)</strong></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>1.0 (1)</td>
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<tr>
<td>High School</td>
<td>6.0 (6)</td>
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<tr>
<td>Some college or associate's degree</td>
<td>27.0 (27)</td>
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<tr>
<td>Graduated college</td>
<td>38.0 (38)</td>
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<tr>
<td>Master's degree or above</td>
<td>28.0 (28)</td>
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<tr>
<td><strong>Father Education, % (n)</strong></td>
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</tr>
<tr>
<td>Less than high school</td>
<td>0 (0)</td>
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<tr>
<td>High School</td>
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<tr>
<td>Some college or associate's degree</td>
<td>20.8 (20)</td>
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<tr>
<td>Graduated college</td>
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<td>Master's degree or above</td>
<td>26.0 (25)</td>
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<tr>
<td>Does not apply</td>
<td>1.0 (1)</td>
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