

Taking Summertime Seriously

Amy Bohnert, Ph.D.

**Associate Professor of Clinical & Developmental
Psychology**

Loyola University Chicago

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SUMMERTIME & HEALTH

Kids gain weight more quickly over summer school break, research shows *The Washington Post*

A New Exercise in Combatting Childhood Obesity: Summer Learning Programs

HUFF
POST

EDUCATION

The Summer Gain: Kids Appear to Bulk Up in the Summer

U.S. News & WORLD REPORT

AIMS

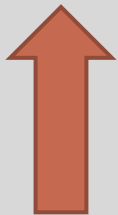
- 1. Fact or fiction:
summertime weight gain?
- 2. What factors are responsible for this weight gain?
- 3. What do we still need to know?
- 4. How do we work with families & youth to reduce summertime weight gain?

OUTSIDE-OF-SCHOOL TIME (OST)

- OST refers to periods of the day and year when youth are not involved in formal schooling.
 - Before & after-school time, as well as to evenings and weekends & summer months.
- Bio-ecological model (Brofenbrenner & Morris, 2006)
 - OST settings serve as an important contextual influence on youth.
- Youths' OST both *represents & reinforces* INEQUALITIES.

OUTSIDE-OF-SCHOOL TIME: SUMMERTIME

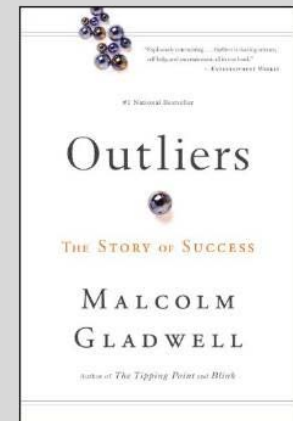
- Summertime represents almost 1/4 of year
- Slide in academics is well-documented
 - Math computation skills: 2 months for most
 - Reading achievement:



Middle-class



Low-income youth



SUMMERTIME: LINKING ACADEMICS & HEALTH

**Socio-economic
risk factors**

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graph TD; A[Socio-economic risk factors] --- B[Academics]; A --- C[Health & Obesity]
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Academics

**Health &
Obesity**

OUTSIDE-OF-SCHOOL TIME: SUMMERTIME

■ *FAUCET THEORY*

- Entwisle, Alexander & Olson, 2001



- *Summer is a unique developmental context for youth that is characterized by differing amounts of structure and resources than during the school year particularly for low-income youth.*

CURRENT OBESITY RATES AMONG YOUTH

ALL CHILDREN

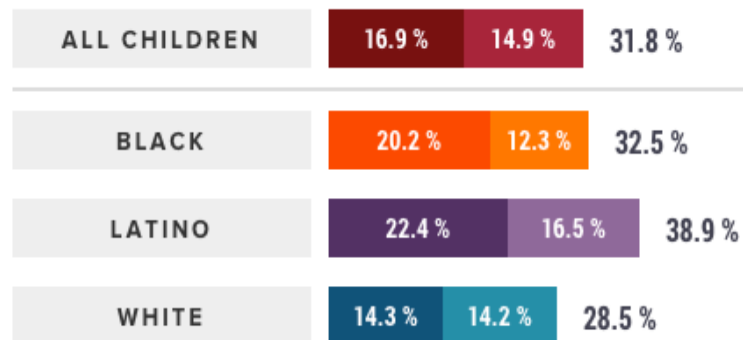
BOYS

GIRLS

OBESITY RATE

OBESE & OVERWEIGHT

CURRENT OBESITY & OVERWEIGHT RATES AMONG CHILDREN BY RACE AND ETHNICITY (2011-2012)



Children 2 to 19. Source: Wang Y and Beydoun MA. The Obesity Epidemic in the United States — Gender, Age, Socioeconomic, Racial/Ethnic, and Geographic Characteristics: A Systematic Review and Meta-Regression Analysis. *Epidemiol Rev*, 29: 6-28, 2007. And, CDC/NCHS, National Health and Nutrition Examination Survey, 2011-2012.

OUTSIDE-OF-SCHOOL TIME AND HEALTH

- **Low-income, minority youth enrolled in after-school programs were:**
 - less likely to be obese three years later than those who were not involved (Mahoney, Lord, & Carryl, 2005)
 - spend less time snacking and eating as compared to adolescents who did not participate (Vandell et al., 2005)
- **Barr-Anderson et al., 2014 suggests that:**
 - Afterschool and summer programs offer potential benefits & may influence diet and PA for African American youth.
- **Zarrett & Bell, 2014**
 - Involvement in sports-dominant activity patterns for 2 or more years during adolescence associated with significantly lower odds of being at-risk for oversight/obesity compared to other activity-based groups.



SUMMERTIME & HEALTH



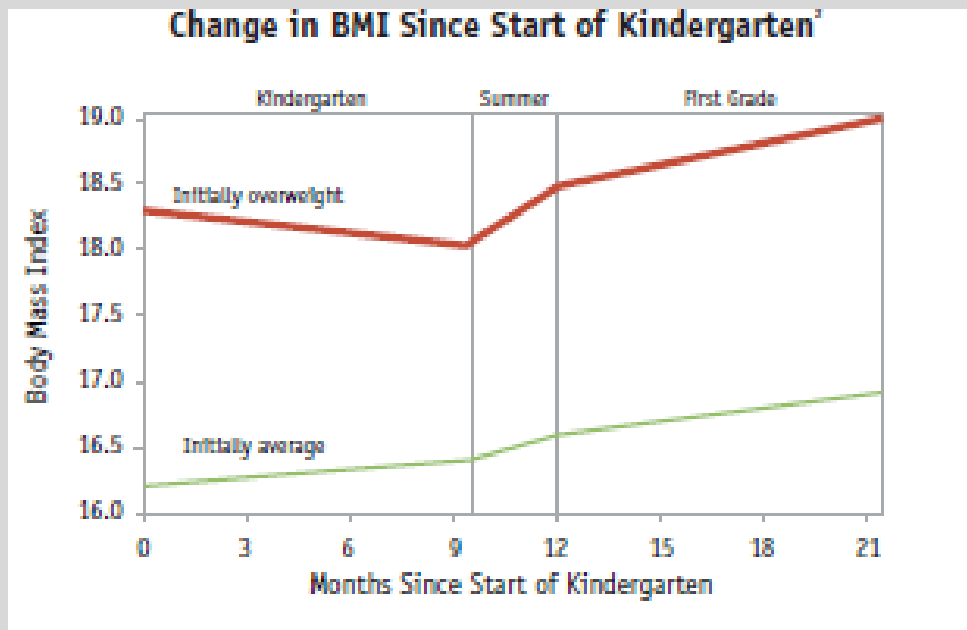
SCHOOL YEAR

SUMMERTIME

von Hippel et al., 2007

SUMMERTIME & HEALTH

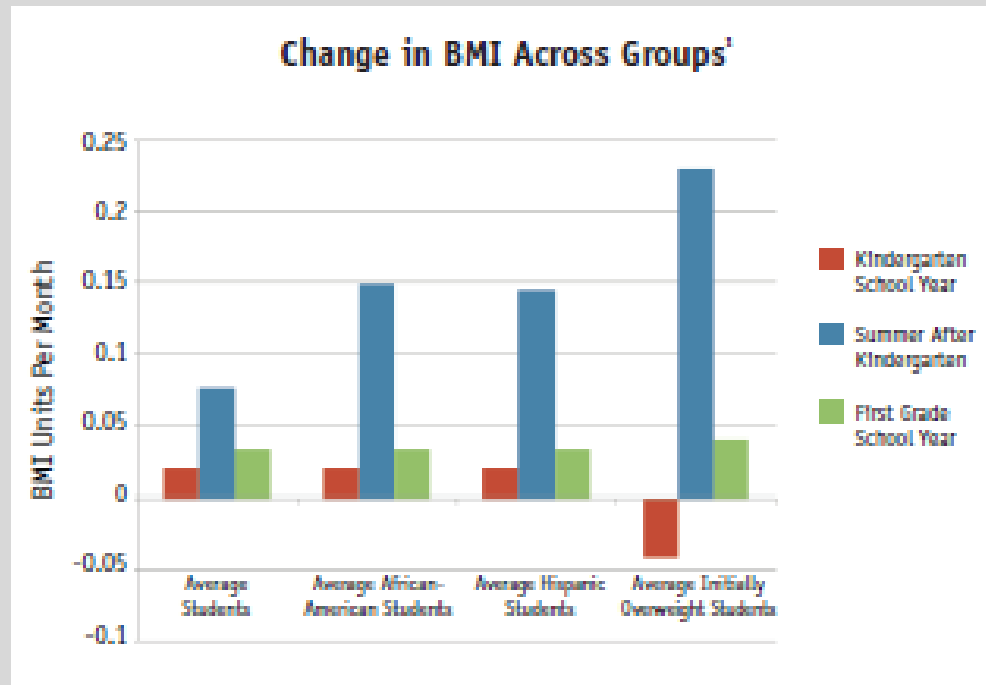
VON HIPPEL ET AL., 2007



Summertime (between K & 1st grade) weight gain:
3x greater than the Kindergarten school year
2x greater than the 1st grade year.

SUMMERTIME & HEALTH

VON HIPPEL ET AL., 2007

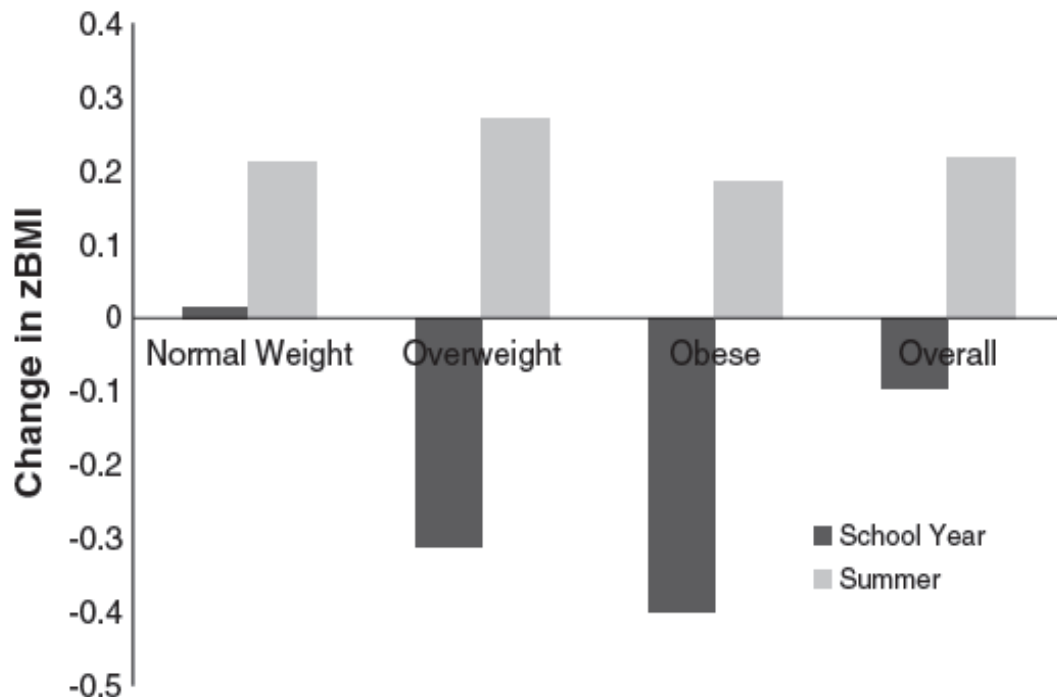


Racial/ethnic gaps in BMI grew only during summertime.

During K & 1st grade, weight gains among three racial/ethnic groups were roughly equivalent during the school year.

SEASONAL CHANGES IN zBMI THROUGHOUT ELEMENTARY SCHOOL

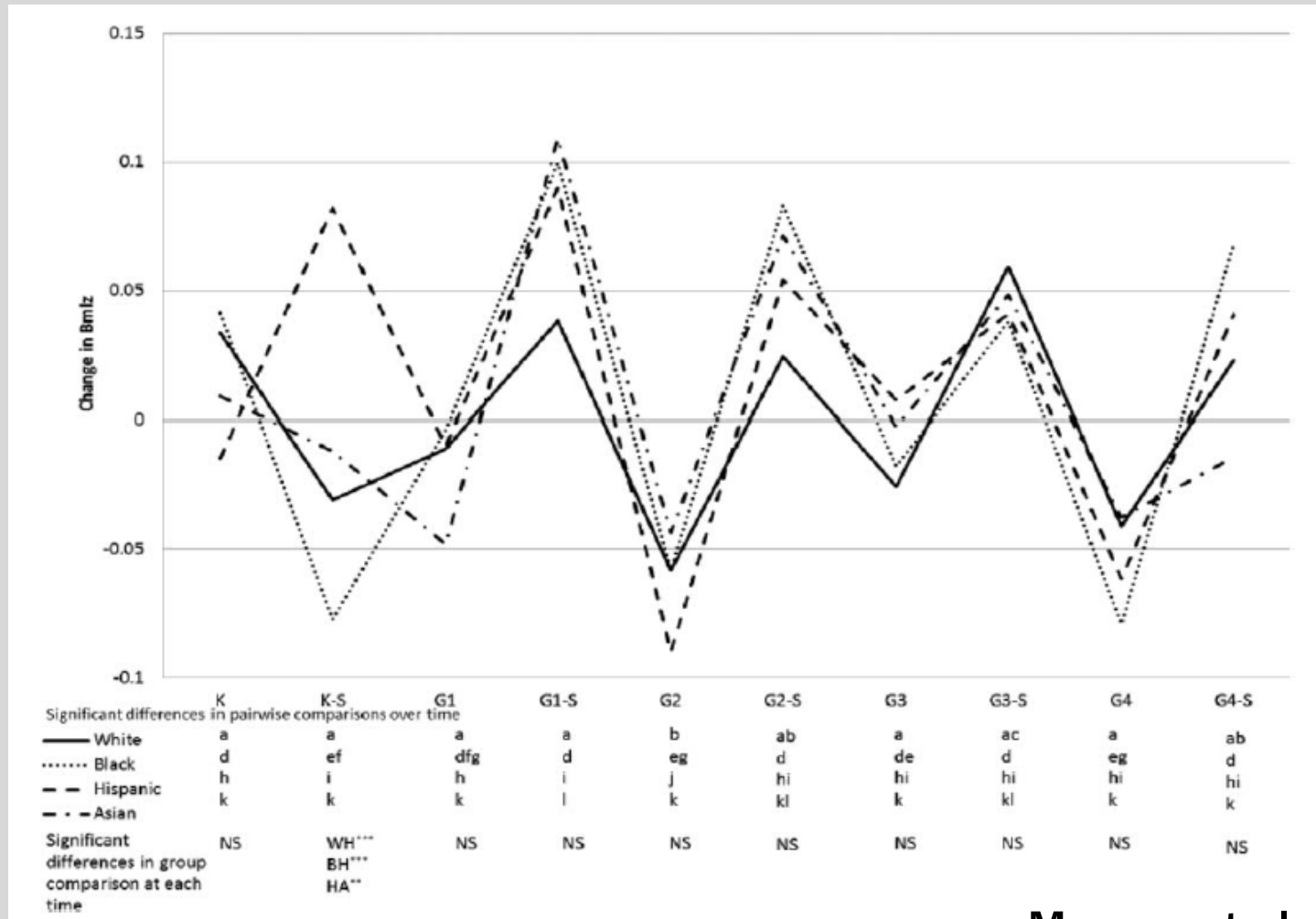
Figure 1. Total Change in zBMI During the School and Summer Months Across Weight Classifications



Moreno et al., 2013

- Elementary school age youth (K-5th)
- School year: lost 1.5 BMI percentile points
- Summer: gained 5.2 percentile points

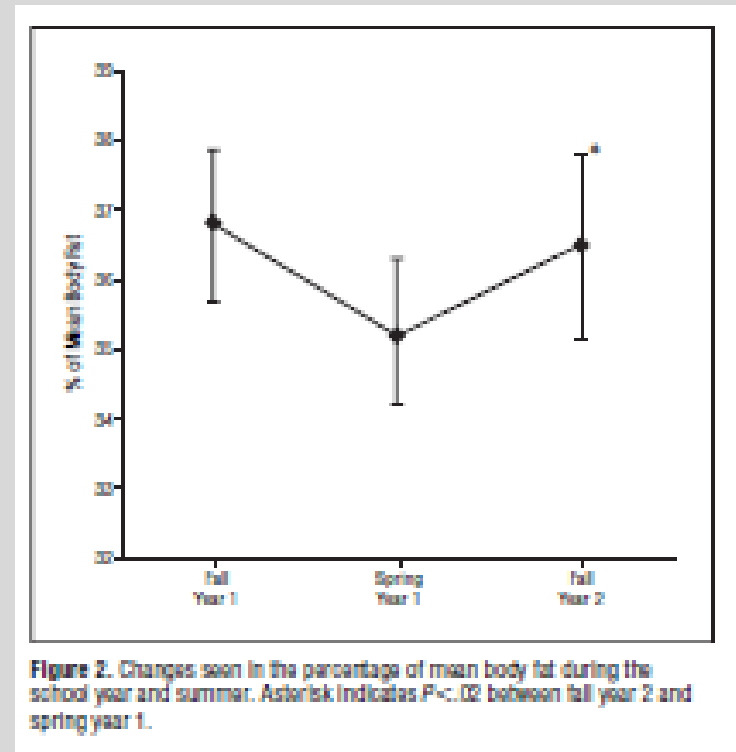
SEASONAL CHANGE IN ZBMI THROUGHOUT ELEMENTARY SCHOOL



SUMMERTIME & HEALTH

CARREL ET AL., 2007

- Overweight middle school youth attending a lifestyle, fitness-focused PE program.
- Are the benefits of school-based fitness programs lost over summer break?
 - Return to baseline levels after significant gains during the school year



SUMMERTIME & HEALTH: NARRATIVE REVIEWS

Franckle, Adler, & Davison, 2014

Objective: Narrative review of variations in student weight during summer vs. school year

- 7 studies reviewed
 - 6/7 evidenced accelerated summer weight gain, especially in black, Hispanic, and overweight youth.
- **Conclusions:** Increased weight gain during summer, particularly in certain racial/ethnic populations and overweight youth.
- **Potential solutions?** Increased access to summertime recreation, PA and/or food programming.

Baranowski et al., 2014

Objective: Narrative review of seasonal patterns in adiposity, PA, and sleep for overweight and healthy weight children.

- 18 studies reviewed
 - Descriptive, Intervention, and Seasonal Differences in PA
- **Conclusions:** Schools may provide some protection against obesity.
- **Future directions?** Determine when, where, why differences occur between school and summertime weight gain.

SUMMERTIME & HEALTH: CONCEPTUAL FRAMEWORK

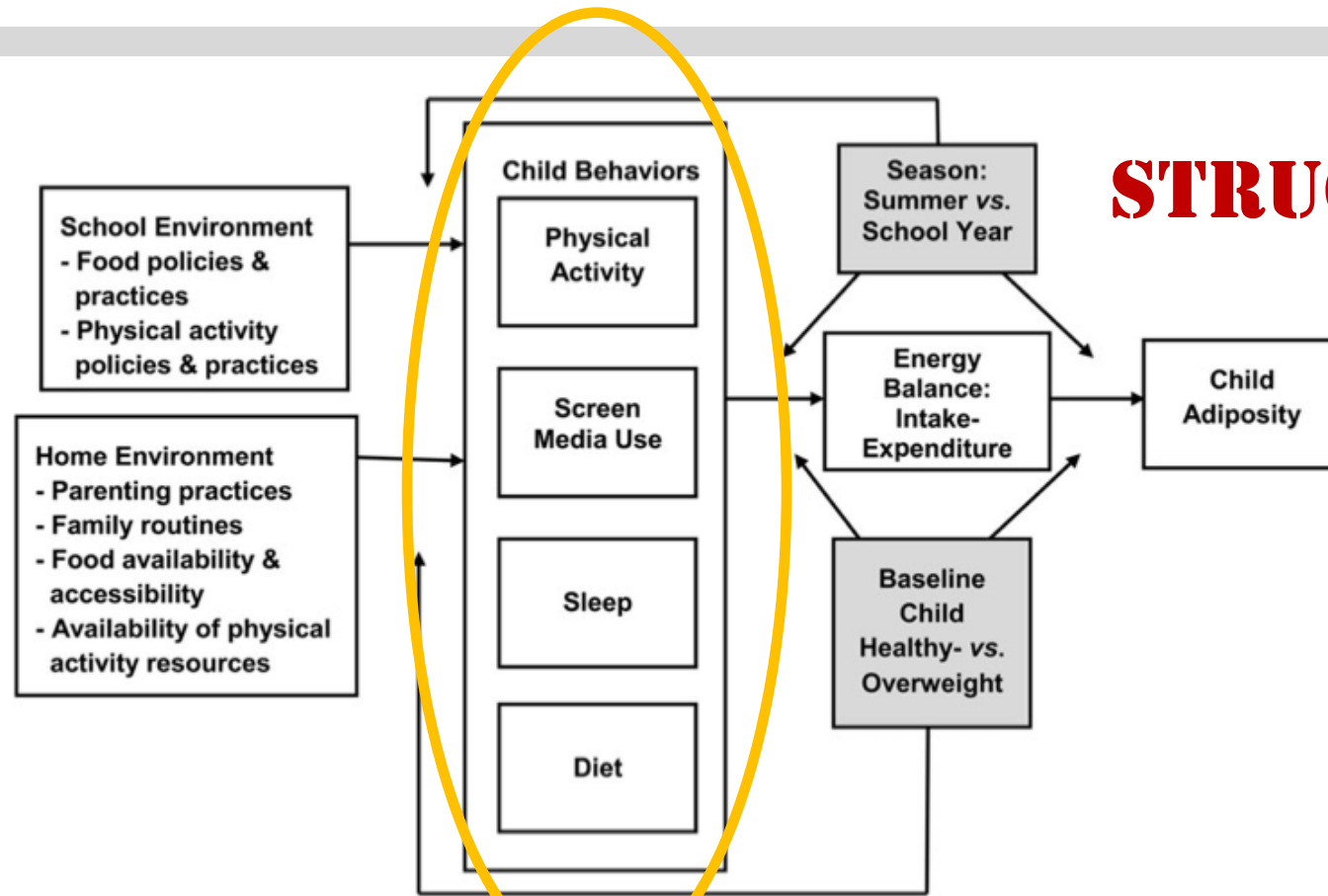


Figure 1. Conceptual model of influences on seasonal differences in BMI (shaded boxes indicate possible moderating variables).

WHY ARE KIDS GAINING WEIGHT OVER THE SUMMER MONTHS? MECHANISMS

■ STRUCTURE

■ Summer/Year-round school?

- Von Hippel et al., (2007) suggested inconclusive effects
- Selection effects beyond basic socio-demographics

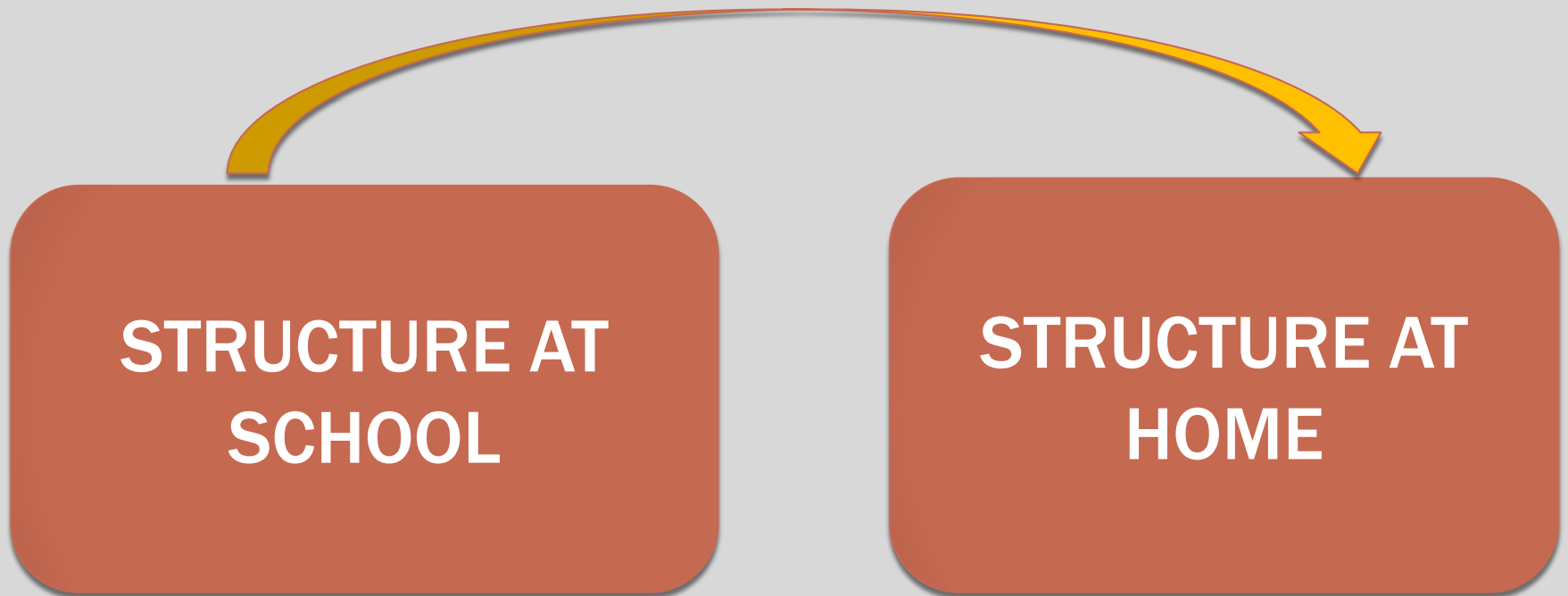
■ Summer programming?

- Youth whose summers involve regular participation in organized, structured activities have lower BMIs even after controlling for demographic risk factors for obesity (Mahoney, 2011; Parente & Mahoney, 2012).



TRANSACTIONAL PROCESSES BETWEEN SCHOOL & NON-SCHOOL INFLUENCES

- HOW DOES STRUCTURE HELP???
- Both DIRECT and SYNERGISTIC EFFECTS



SUMMERTIME & HEALTH: CONCEPTUAL FRAMEWORK

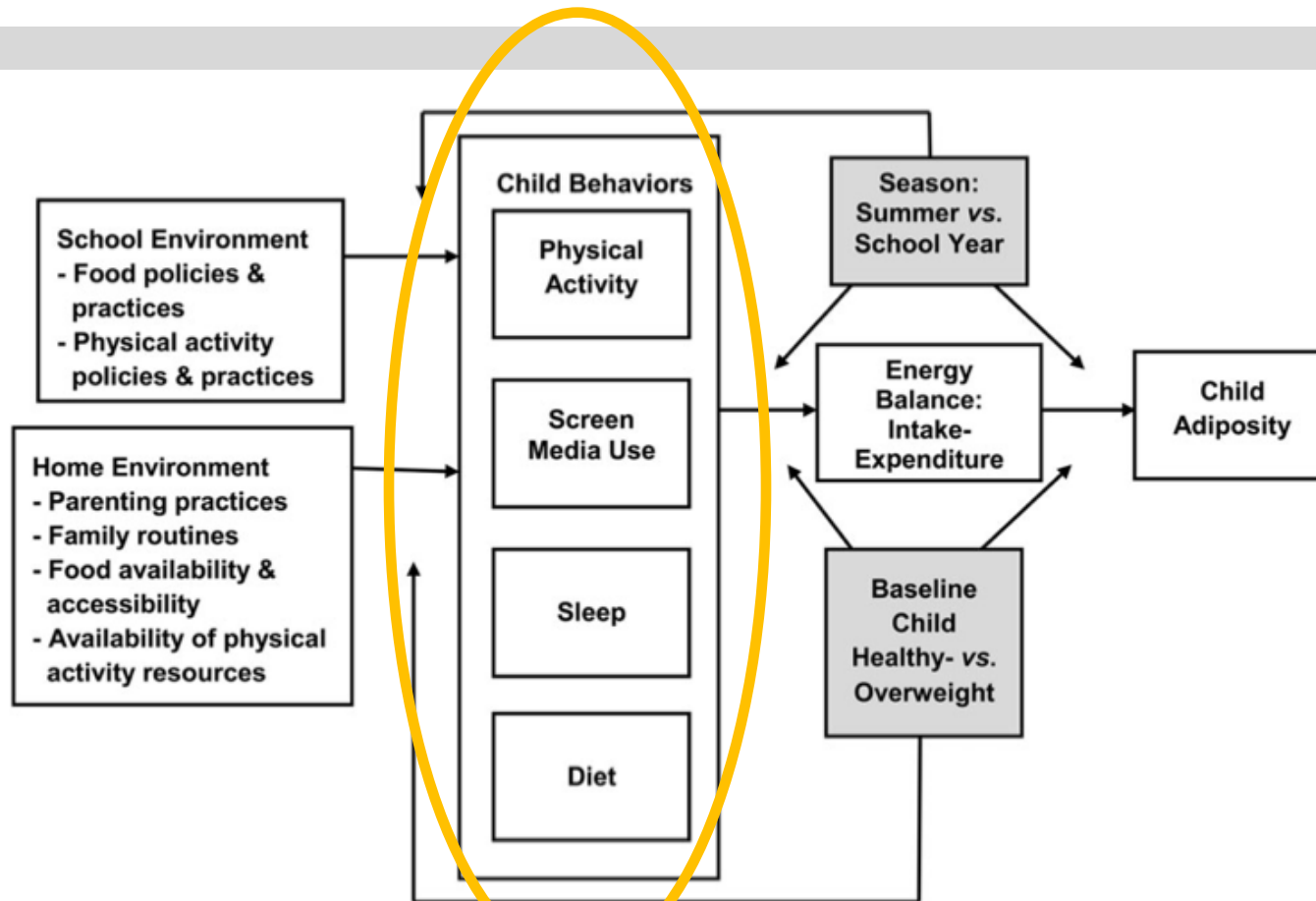


Figure 1. Conceptual model of influences on seasonal differences in BMI (shaded boxes indicate possible moderating variables).

WHY ARE KIDS GAINING WEIGHT OVER THE SUMMER MONTHS? STUDIES THAT HAVE EXAMINED POTENTIAL MECHANISMS

■ Tovar et al., 2010

- Elementary-age students who spent more time in camp were more active in contrast to children in parent care.

■ McCue et al., 2013

- % time in sedentary time *increased*
- % time in light & moderate PA *decreased*
- No changes in MVPA or VPA.
- No changes in total calories, protein, total fat, carbohydrates.

ACTIVE SUMMERS MATTER (ASM) PROJECT

- **Primary goal of study:** To examine the effectiveness of a summer day camp program focused on health and well-being in reducing BMI and decreasing obesogenic behaviors amongst low-income urban minority girls.

Summertime represents a critical period of intervention to reduce obesity risk among low-income, urban African American and Latina girls.

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Active summers matter: Evaluation of a community-based summertime program targeting obesogenic behaviors of low-income, ethnic minority girls

*Amy M. Bohnert, Amanda K. Ward,
Kimberly A. Burdette,
Rebecca L. Sifton, Lara R. Dugas*

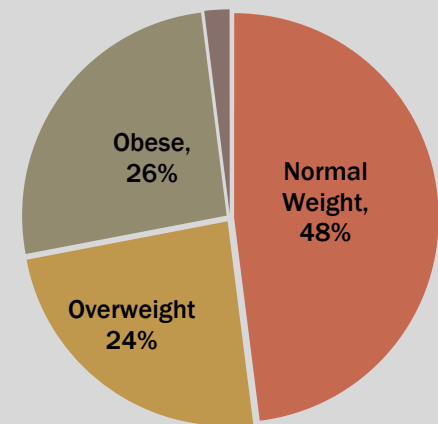
OBESITY AMONG CHILDREN and adolescents in the United States has reached unprecedented levels, and low-income minority females have been disproportionately affected.¹ Despite concerns about schools providing healthy environments, how youth spend their out-of-school time may be more problematic. The relevance of the summer months, which represent a quarter of the calendar year for average youth, is often overlooked despite the fact that summertime waking hours nearly equal the number of hours spent in school over the entire academic year.² The few studies that have addressed this issue suggest that the summer months contribute disproportionately to weight gain.³ In fact, youth gain weight twice as fast during the summer months as during the rest of the calendar

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ASM: PARTICIPANTS

- Urban girls enrolled in a summer day camp program
 - $N=46$
 - Ages 10-14 ($M=11.96$, $SD=1.15$)
 - Majority African American (52%) or Hispanic (39%)
 - BMI ($M=21.77$), zBMI ($M=0.78$)
- Two time points
 - T1 – 1-2 weeks prior to camp
 - T2 – Final week of camp



ASM: METHOD

- Program: Girls in the Game (GIG) Summer Sports & Leadership Camp
 - 6 hours daily; 4 consecutive weeks
 - Sport and fitness instruction & activities
 - Health and nutrition education
 - Development of self-control
 - Leadership skills
 - Daily healthy lunch and snacks
 - Targets low-income Chicago girls
- 2 waves of data used in these analyses:
 - 2012, 2013



ASM: MEASURES

■ Anthropometrics – BMI

- Weight and height measured
- Converted to BMI, zBMI

■ Accelerometry – Physical Activity, Sleep

- ActiGraph GT3X
- PA variables: light, moderate, vigorous activity; sedentary time (min)
- Sleep variables: duration (min), efficiency (%), bedtime (HH:MM)

■ 24-hour Dietary Recall – Nutrition

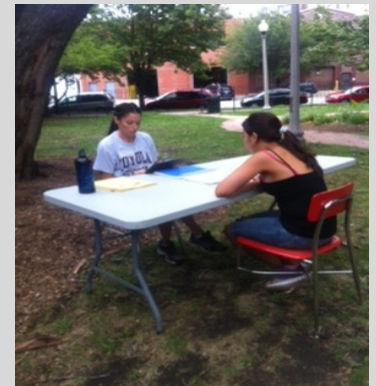
- Trained research assistants, gold standard measure
- 2x pass thru each day
- Variables calculated thru University of Minnesota Nutrition Data System for Research



ASM: MEASURES

- Executive Functions – Questionnaires
 - *Behavior Rating Inventory of Executive Function (BRIEF)*
 - 4 subscales: Shift, Working Memory, Inhibit, and Emotional Control
 - Self-report (issues with parent and coach report)

- Executive Functions – Neuropsychological Testing
 - *Delis-Kaplan Executive Function System (D-KEFS)*
 - Color-Word Interference subtest
 - Assesses inhibition, shifting
 - *Wechsler Intelligence Scale for Children-IV (WISC-IV)*
 - Digit Span
 - Assesses short-term auditory memory, attention/concentration



ASM: RESULTS

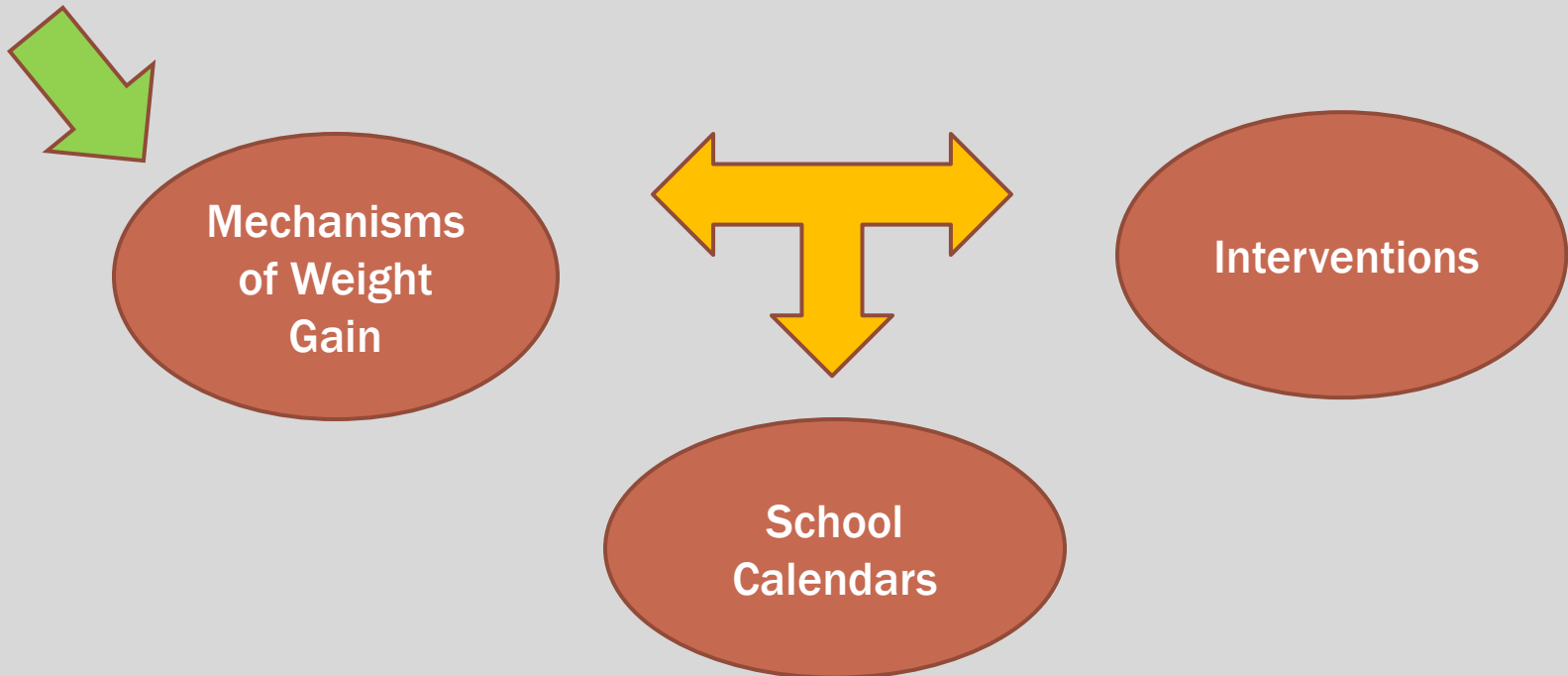
- **zBMI** increased by 0.06 from T1 to T2 ($p=.008$)
- **PA** increased significantly for all measures
 - Total PA increased by more than 151 min/day ($p<.001$)
 - MVPA increased by 26 min/day ($p<.001$)
 - 5-min bouts increased by 1 per day ($p<.001$)
 - Min spent in bouts increased by 18.76 min/day ($p<.001$)
- **Sedentary time** decreased significantly by more than 121 min/day ($p<.001$)
- **NO** change in reported **media use** from T1 to T2 ($p>.05$)

CONCLUSIONS

- The GIG program is effective in improving patterns of PA and sedentary behaviors among early adolescent girls.
 - Girls benefitted from GIG programming regardless of weight status, age.
- Summer day camps may be effective at increasing PA and decreasing sedentary time.
- Providing engaging, active summer programs for girls may be critical to curb summer weight gain.

NEXT STEPS

■ SUMMERTIME INITIATIVES



MECHANISMS OF SUMMERTIME WEIGHT GAIN

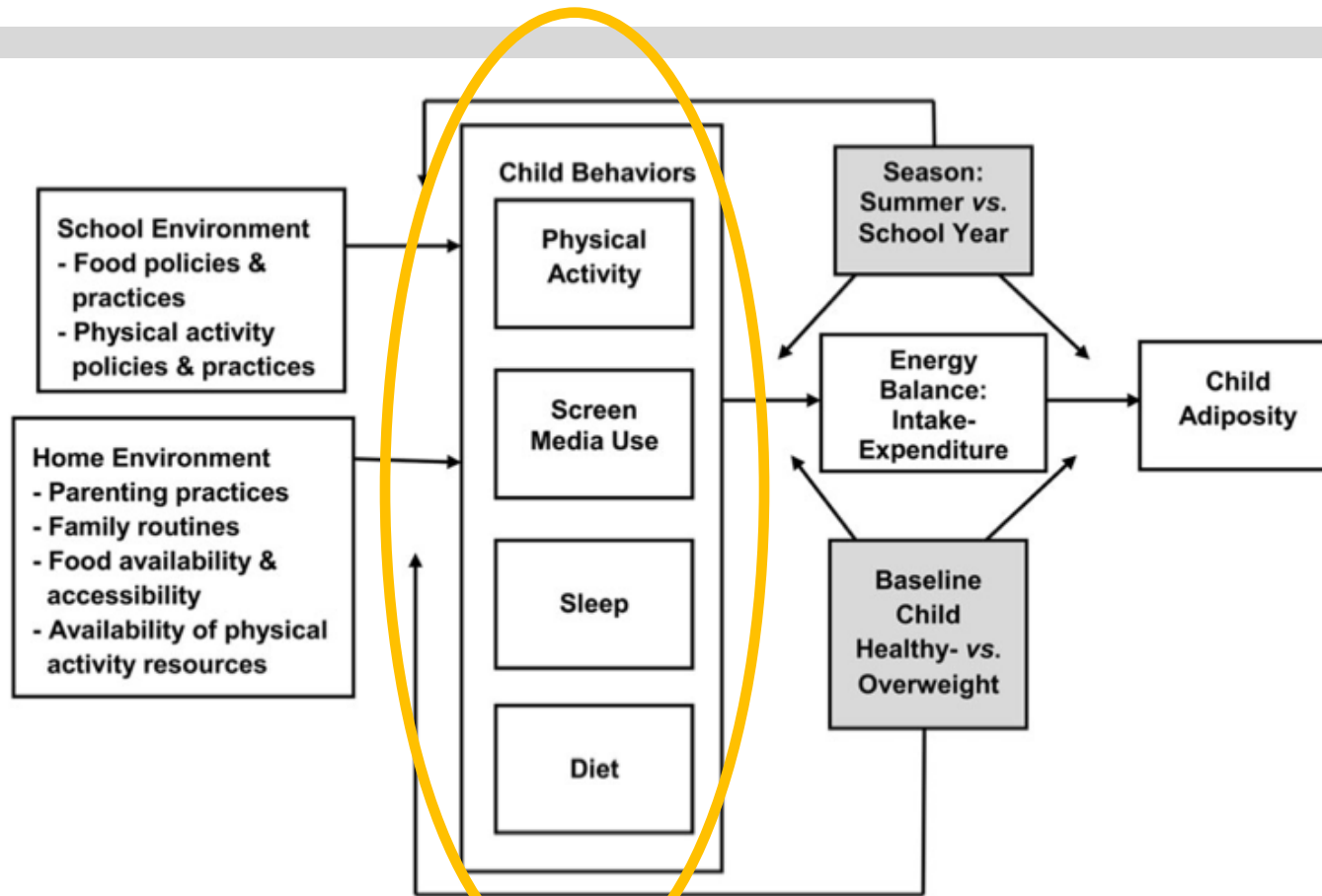
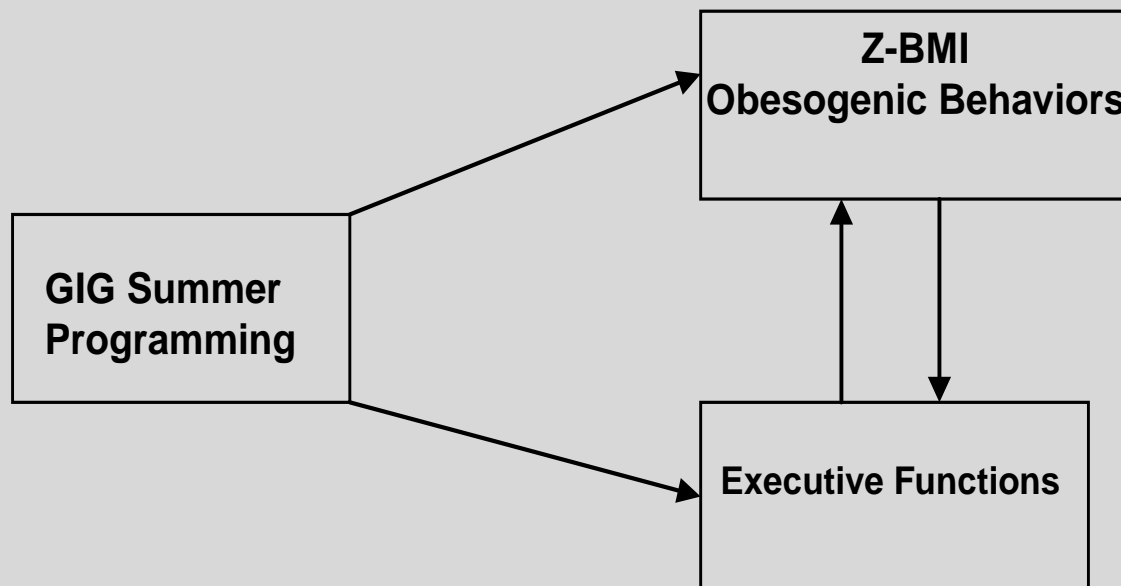


Figure 1. Conceptual model of influences on seasonal differences in BMI (shaded boxes indicate possible moderating variables).

ASM: SUMMERTIME WEIGHT GAIN

Figure 1: Conceptual Model

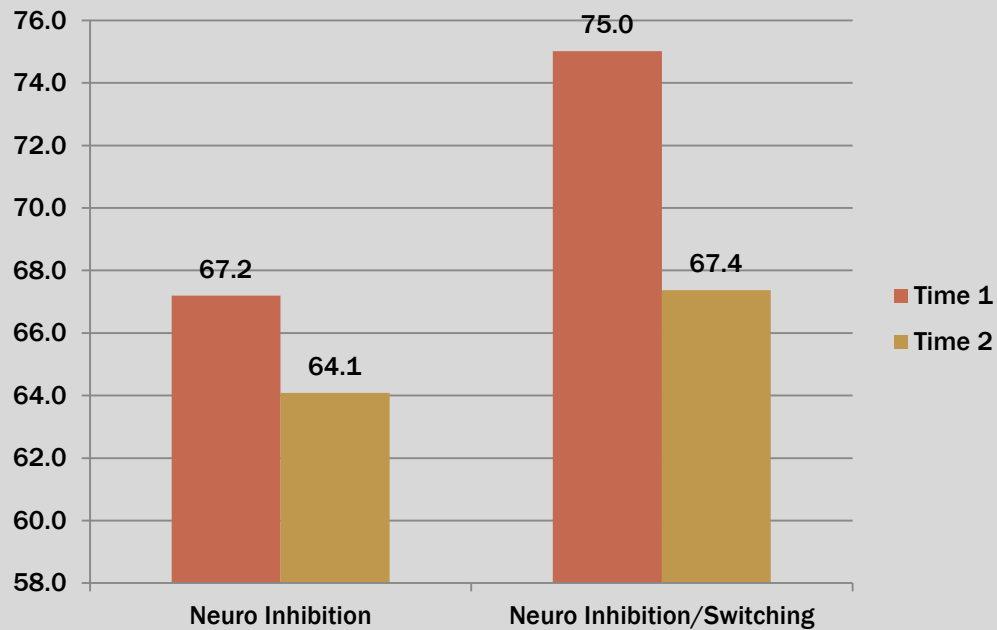


MECHANISMS OF SUMMERTIME WEIGHT GAIN

ASM: PRELIMINARY RESULTS

■ Neuropsychological Testing of Executive Functions

- Results reported in seconds taken to complete D-KEFS Color-Word Inference Test
- N=59



$p < .05$

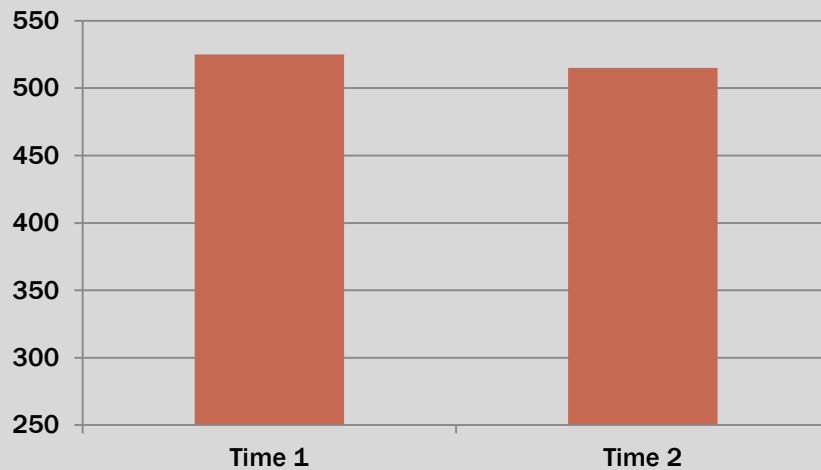
MECHANISMS OF SUMMERTIME WEIGHT GAIN

ASM: PRELIMINARY RESULTS

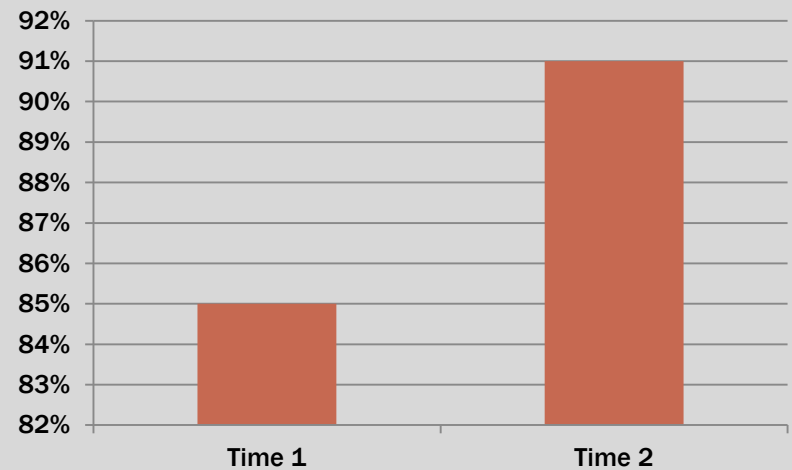
■ Objective Measurements of Sleep

- Accelerometer-measured sleep (5-night average at T1 and T2)
- N=31

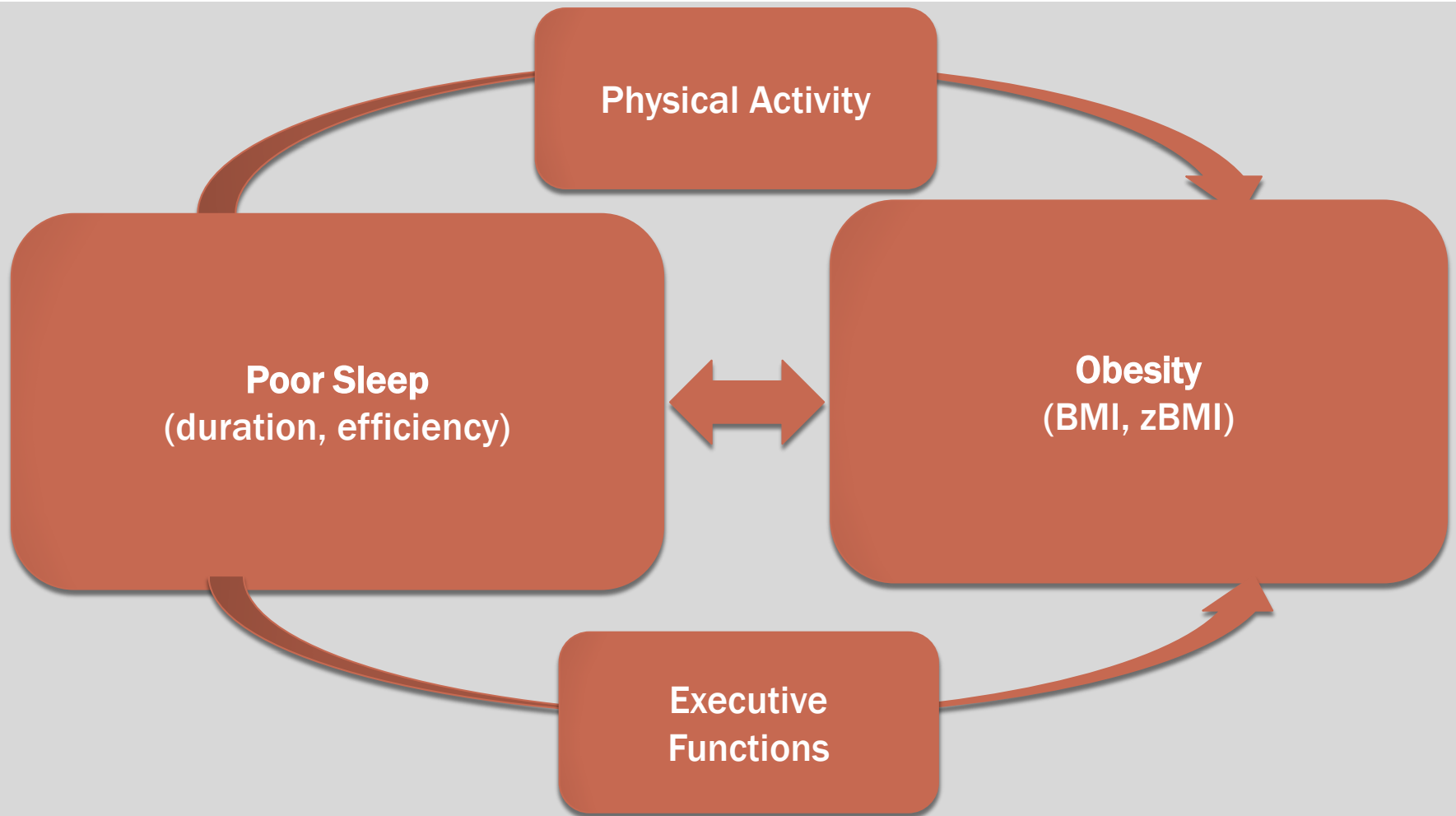
Nightly Sleep Duration (min)



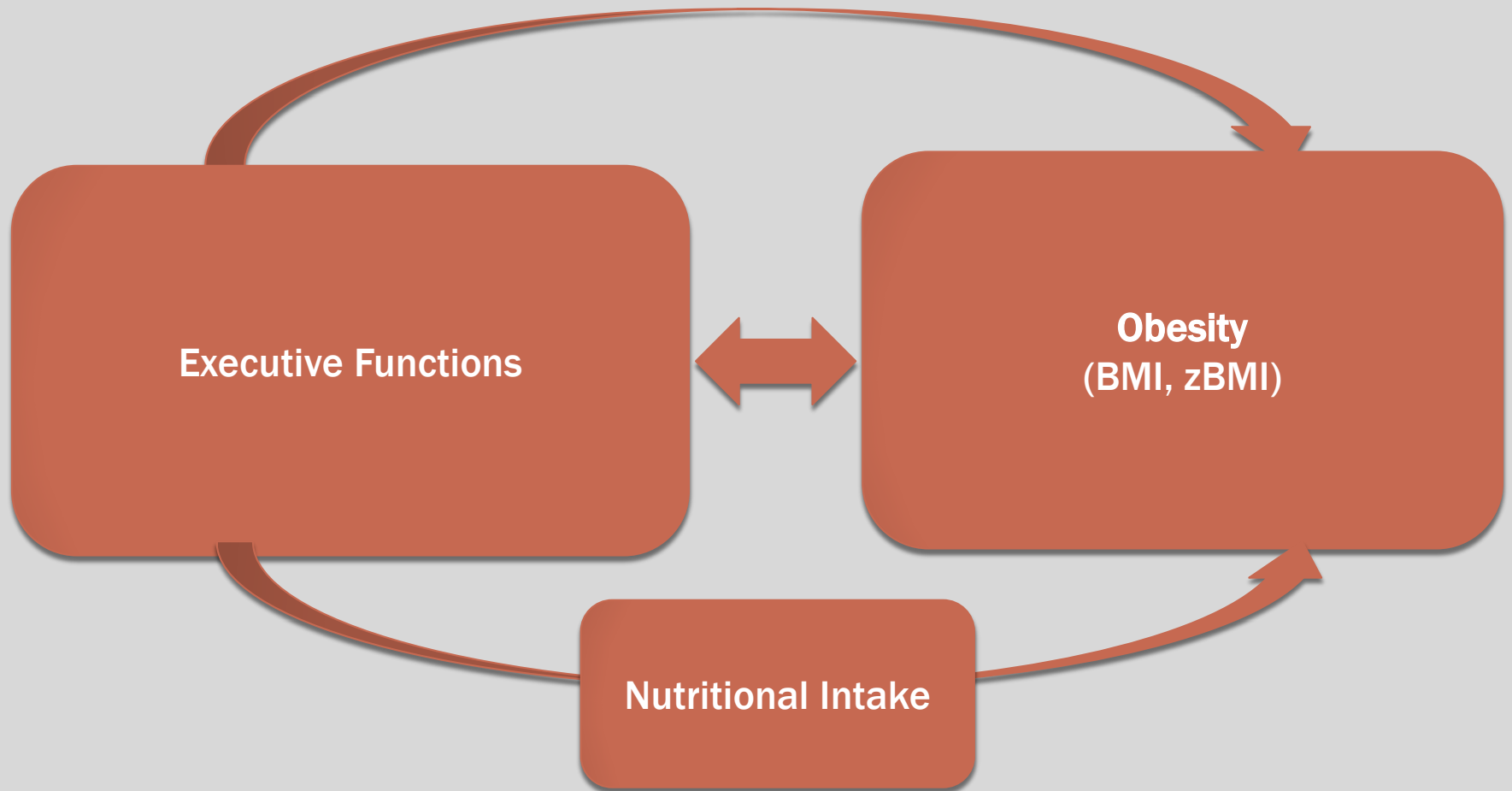
Nightly Sleep Efficiency



ASM: EXAMINING MECHANISMS

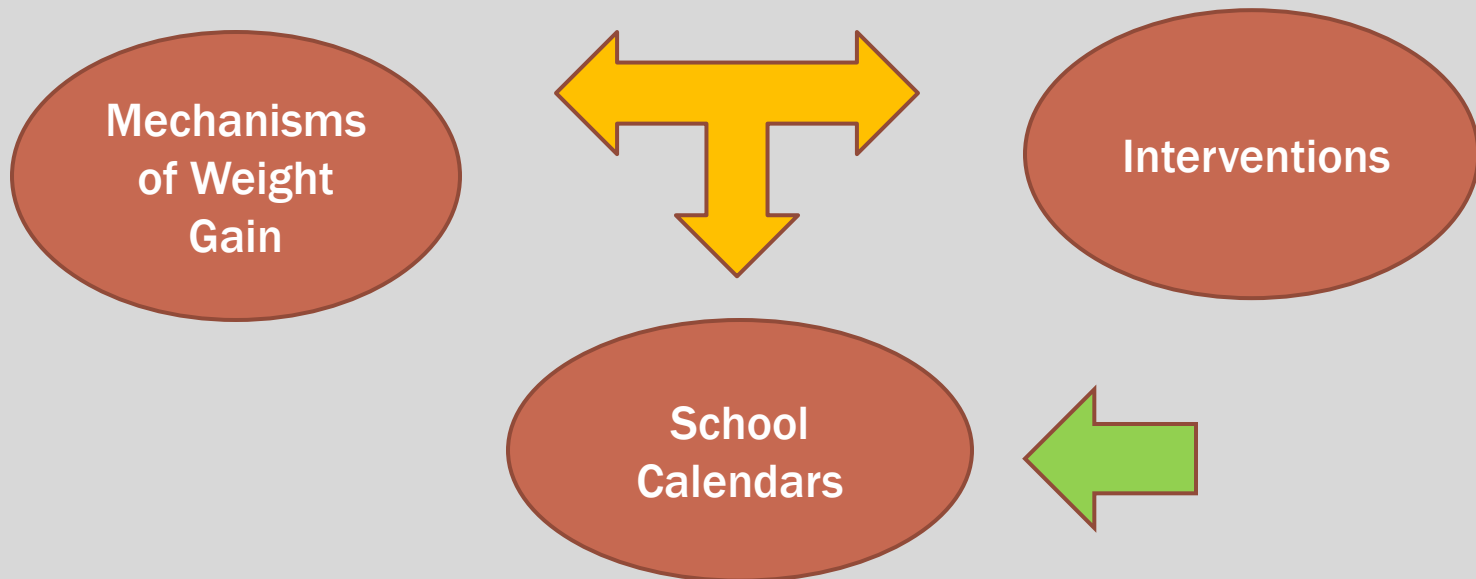


ASM: EXAMINING MECHANISMS



NEXT STEPS

■ SUMMERTIME INITIATIVES

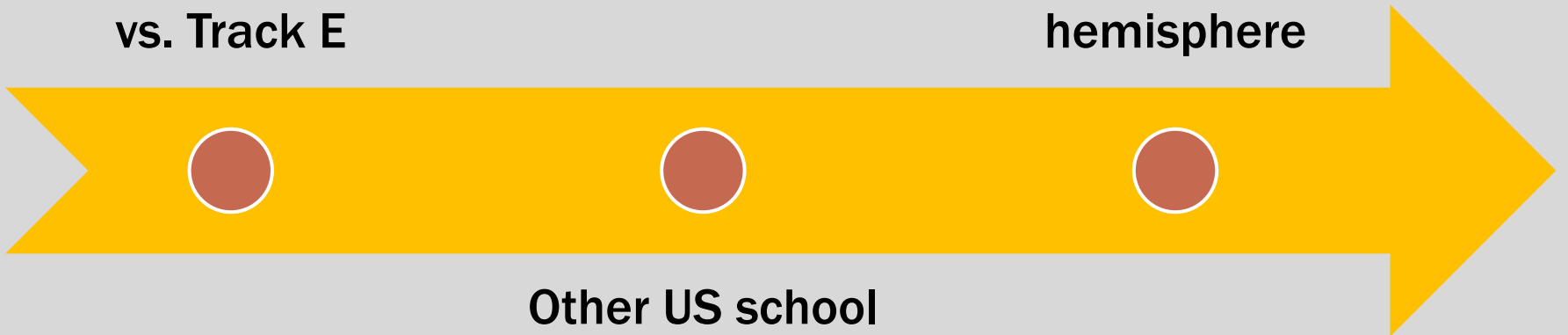


SCHOOL CALENDARS

**Examine Chicago
Public Schools
data for Track A
vs. Track E**

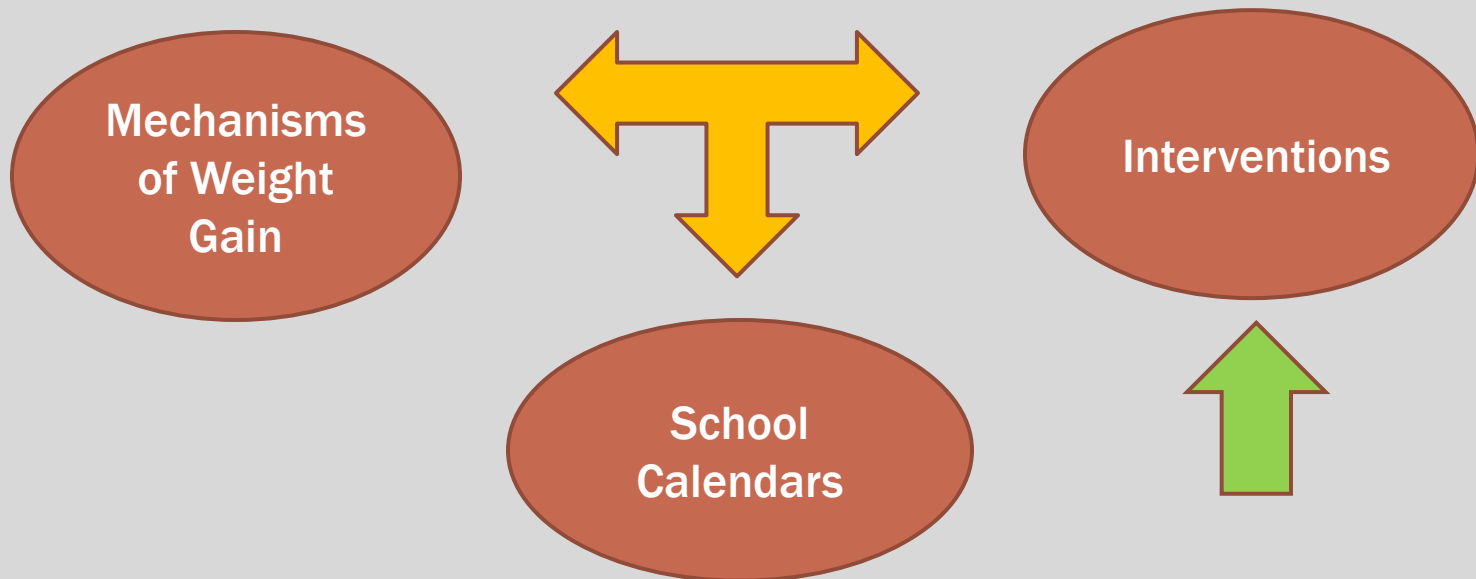
**International
comparisons,
particularly in the
southern
hemisphere**

**Other US school
systems with
varying school
calendars**



NEXT STEPS

■ SUMMERTIME INITIATIVES



SUMMERTIME INTERVENTIONS

**Understand
barriers to
participation**

**N= 15 semi-
structured
interviews with
parents**

**Develop
interventions that
connect youth to
existing programs**

**Strengthening
Summertime
Intervention**

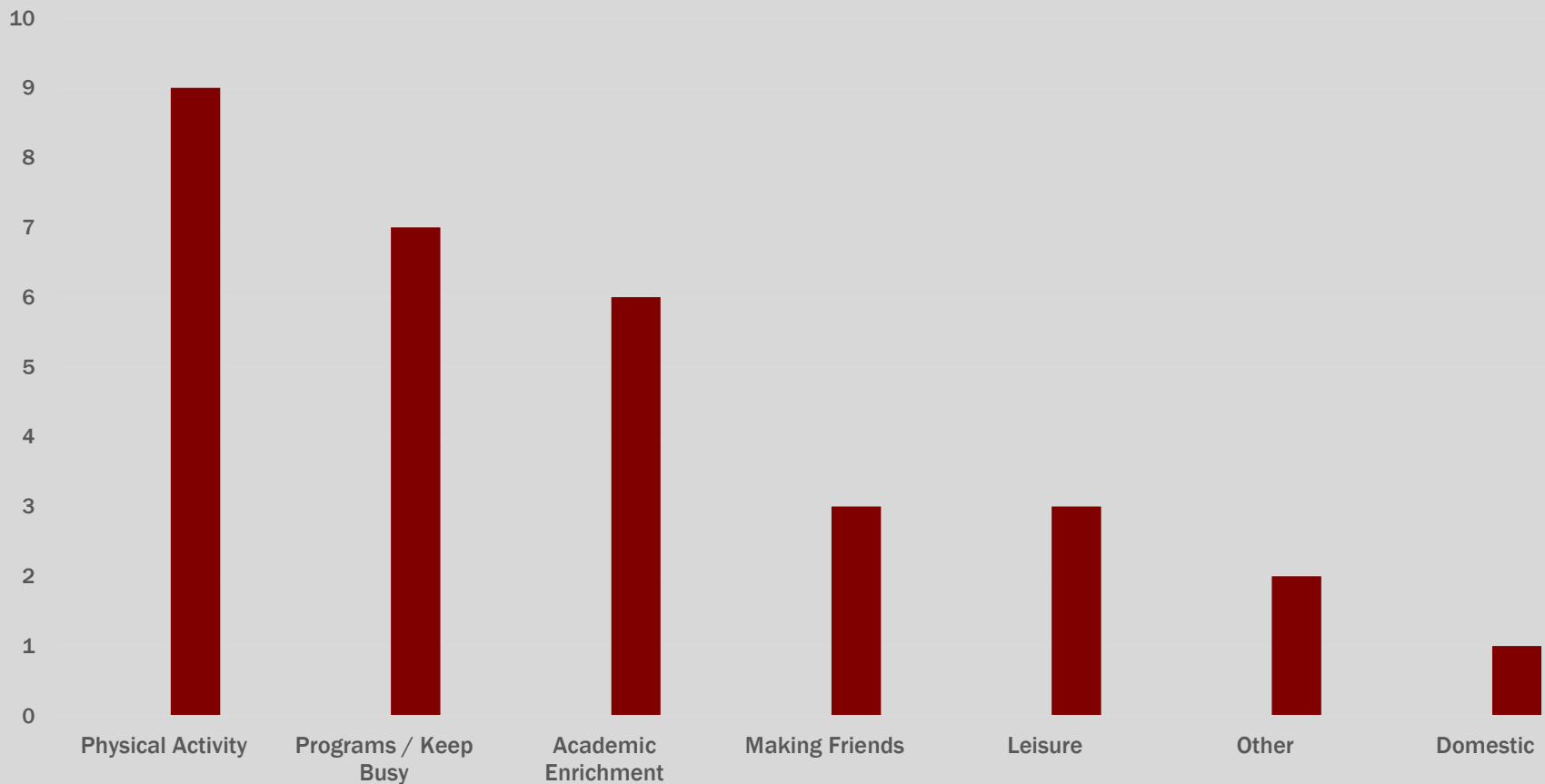
**Examine the
health benefits of
summer learning
programs for low-
income youth**

**Partner with
organizations
providing summer
programming
(academic)**

**HOW CAN WE OFFER
FAMILIES AND YOUTH
HEALTHIER
SUMMERTIMES?**

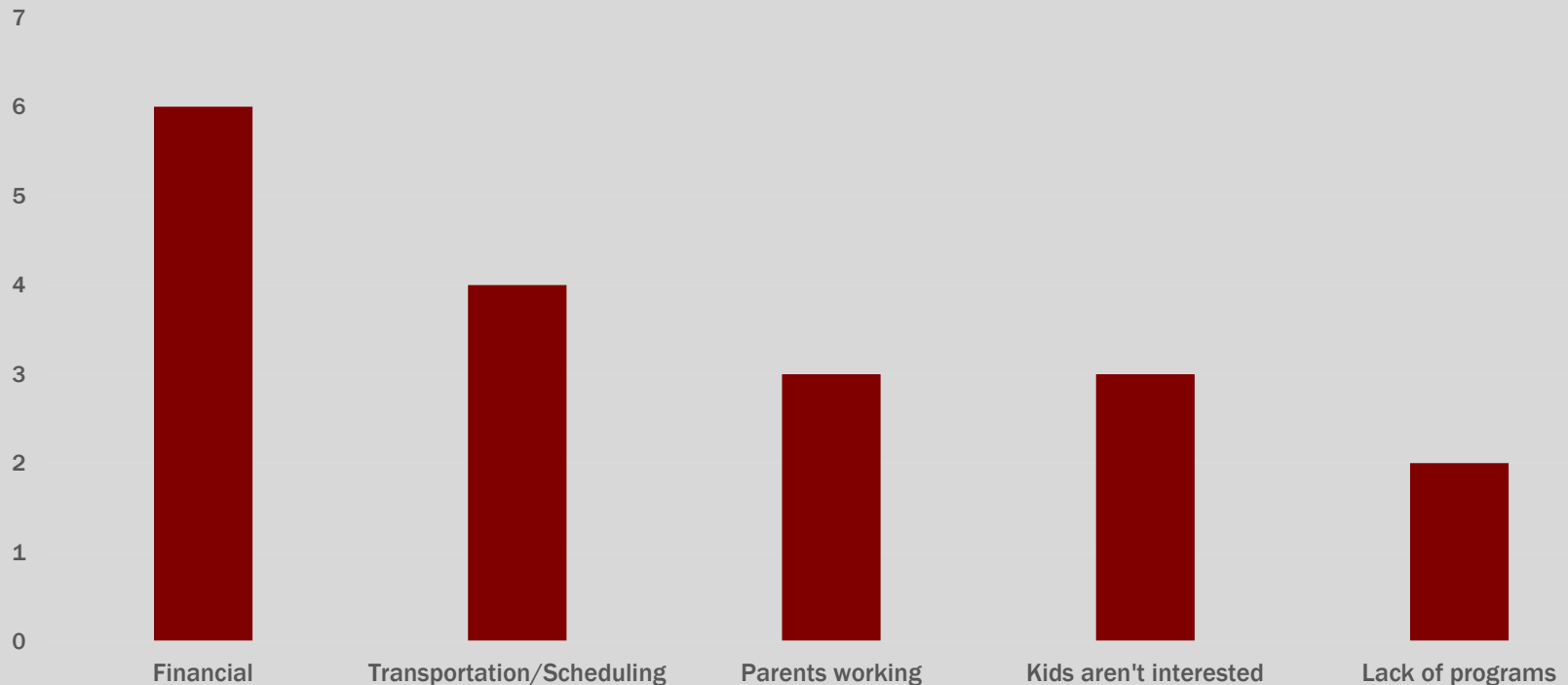
WHAT ARE PARENTS TELLING US ABOUT SUMMERTIME?

How should kids spend their time over the summer?



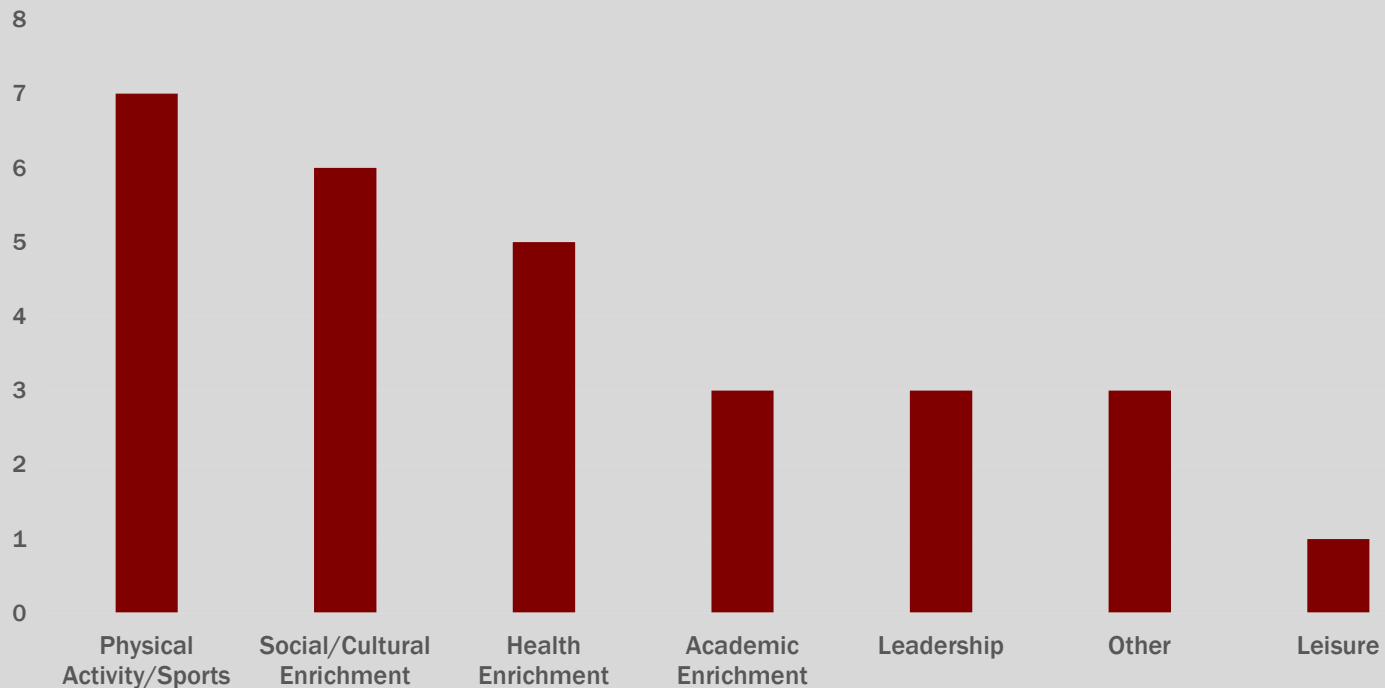
WHAT ARE PARENTS TELLING US ABOUT SUMMERTIME?

What struggles do families face when planning for the summer?



WHAT ARE PARENTS TELLING US ABOUT SUMMERTIME?

What activities do parents prefer at camp?



WHAT CAN BE DONE ABOUT SUMMERTIME WEIGHT GAIN?

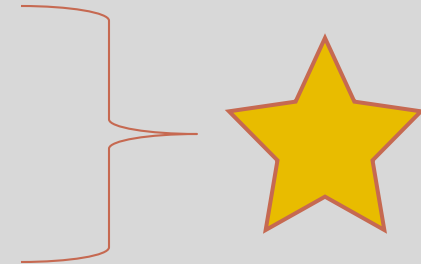
- Emphasize the importance of structure in terms of time use (Mahoney, 2011) & family household routines (i.e., mealtimes, snacking habits, sleep patterns (Moreno et al., 2015)).
 - Synergistic effects?
 - For youth enrolled in programs, parents may not relax the rules as much
- Talk with families about how important it is to get children involved & connected to programming (academic or otherwise) during the summer months (particularly during early elementary years).
 - *Active problem-solving about transportation and finances*

WHAT CAN BE DONE ABOUT SUMMERTIME WEIGHT GAIN?

- Encourage families and children to:
 - Eat only 3 meals per day with one small snack
 - Problem solve regarding how to get affordable fruits and vegetables
 - Drinks!! Encourage water– 5 or more servings.. Problem-solve
- Explore places where children can safely be active in the community.
 - Community collaboration & partnerships to address this

PROGRAMS & RESOURCES TARGETING SUMMERTIME

- YMCA's Summer Learning Program
- Energy Express Program
- Summer Matters Campaign
- National Summer Learning Association
- Wallace Foundation



**ALL CHILDREN DESERVE
ACCESS TO
AFFORDABLE, HIGH
QUALITY SUMMERTIME
PROGRAMMING THAT
SUPPORTS HEALTHY
YOUTH DEVELOPMENT**

ACKNOWLEDGEMENTS



**Provost Office: Summer
Fellowship**

THANK YOU!



CONTACT:
DR. AMY
BOHNERT

abohner@luc.edu

773-508-2961

