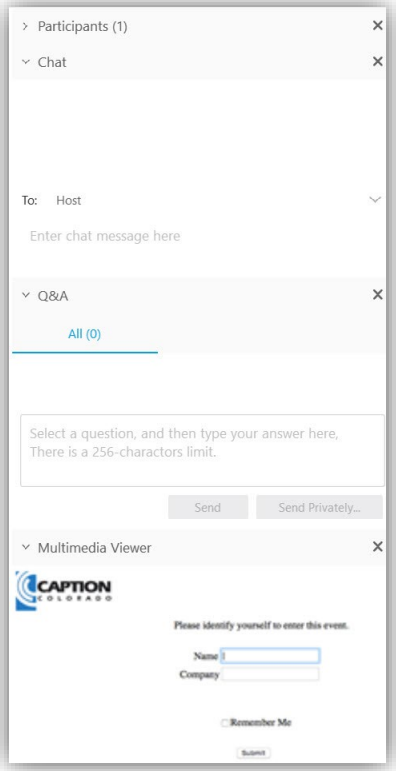
# FLASHE data:
## *Examples and insights from four teams*

NIH NATIONAL CANCER INSTITUTE

September 26, 2019

# Using WebEx and webinar logistics




- All lines will be in listen-only mode
- Submit questions at any time during the presentation by typing into the Q&A feature on the right hand side of the WebEx interface.
  - Select Host and a moderator will ask the questions on your behalf
- Closed captioning available by selecting the Media Viewer Panel on the right hand side of the screen
- This webinar is being recorded

1. *Introduction and goals*
2. *Presentations from FLASHE research teams*
3. *Frequently asked questions*
4. *Q&A with webinar attendees*

# Introduction

*Laura Dwyer, Ph.D.*

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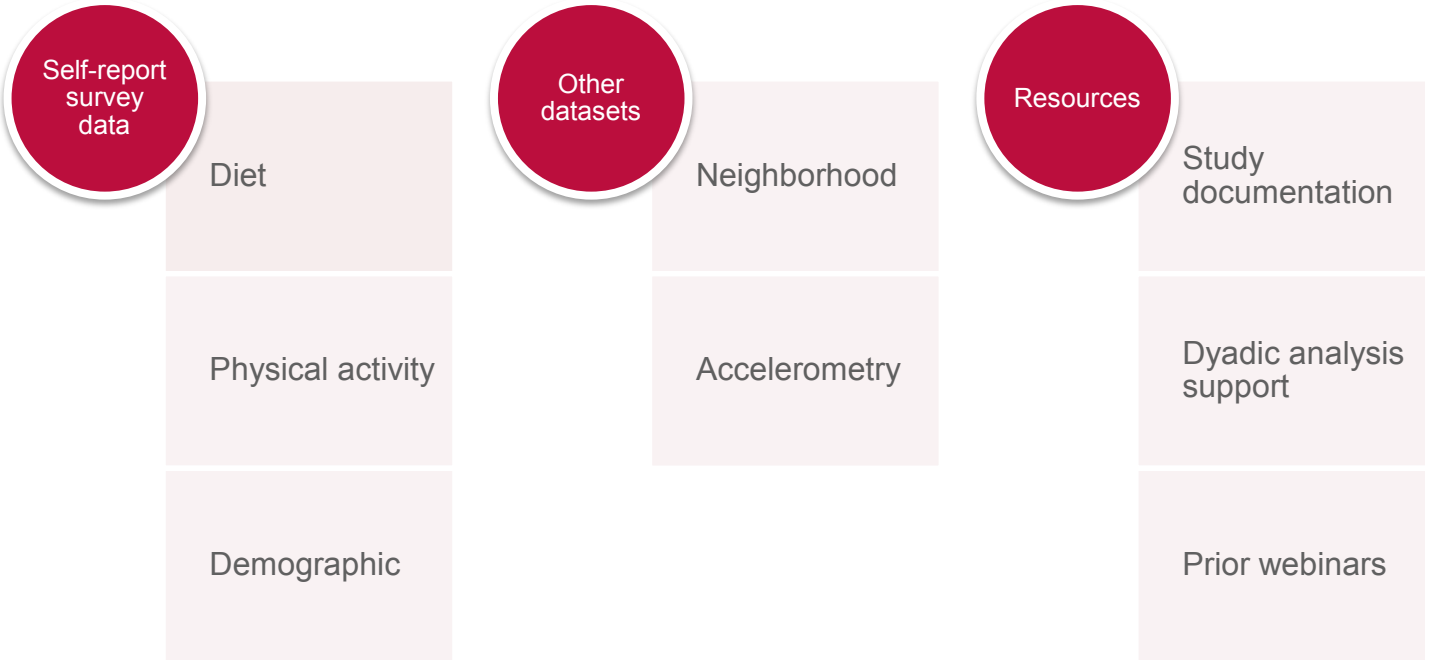
*Linda Nebeling, Ph.D., M.P.H., R.D.*

Behavioral Research Program, National Cancer Institute

# Family Life, Activity, Sun, Health, and Eating (FLASHE) Study

- A 2014 cross-sectional study assessing correlates of cancer-preventive behaviors among 1,945 enrolled parent-adolescent dyads
- https://cancercontrol.cancer.gov/brp/hbrb/flashe.html
- https://cancercontrol.cancer.gov/brp/hbrb/flashe-webinar.html



# FLASHE datasets and key variables

- **Diet-focused survey**
  - *Outcomes*: daily frequencies (fruits/vegetables, junk food, convenience food, fatty meats, sugar sweetened beverages) and predicted daily intakes (fruits, vegetables, dairy, sugars, whole grains)
- **Physical activity (PA)-focused survey**
  - *Primary outcomes*: weekly walking, moderate, and vigorous PA (parents); predicted in-school, out-of-school, and weekend PA (adolescents)
  - *Other outcomes:* electronic device use, sun safety, tanning, tobacco use, and sleep
- **Demographic module** (includes *parenting style*)

# FLASHE datasets and key variables

- **GeoFLASHE**
  - *Primary variables*: Home and school neighborhood characteristics – walkability factors, commuting time, neighborhood socioeconomic status, UV exposure, urban/rural/suburban, home-to-school distance
    - These variables were calculated for several neighborhood shapes (circular / street network) and sizes (400m – 1200m from home / school).

- **Accelerometry**
  - *Primary variables*: Proportions of each corresponding minute spent in: sedentary behavior, light, moderate, and vigorous physical activity using Crouter, Chandler and EMNO cut-points

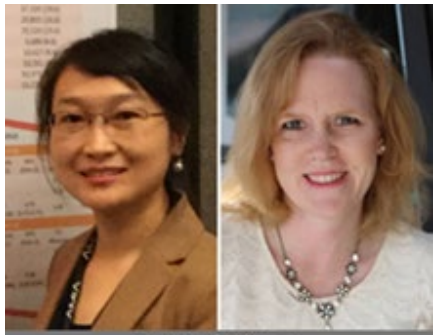
# Webinar Goals

1. Present current and prospective data users with information on projects that have used FLASHE to answer a diverse set of research questions.

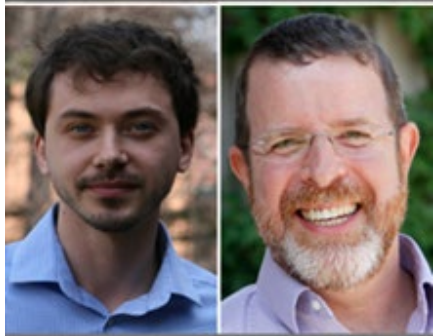
2. Provide an opportunity for FLASHE data users to ask questions about FLASHE datasets and projects.

3. Share information in response to frequently asked questions about FLASHE.

# Featured Research Teams



Rumei Yang
& Lauri Linder



Keven Joyal-Desmarais
& Alexander Rothman

**The effect of screen viewing duration and self-efficacy in limiting screen viewing on loneliness in adolescent-parent dyads: An application of the actor-partner interdependence model**

Rumei Yang, PhD, RN
Assistant Professor
Nanjing Medical University
Nanjing, Jiangsu, China

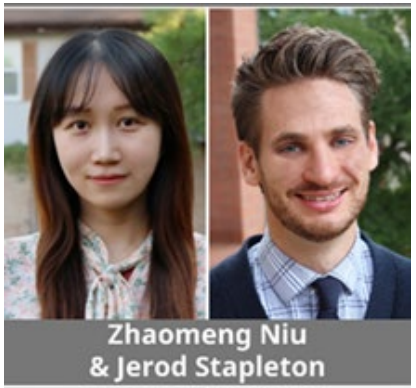
Lauri Linder, PhD, APRN, CPON
Associate Professor, University of Utah College of Nursing
Clinical Nurse Specialist, Primary Children's Hospital, Salt Lake City, Utah

**Interpersonal effects of parents and adolescents on each other's health behaviours: a dyadic extension of the theory of planned behavior**

Keven Joyal-Desmarais, BA
PhD Candidate in Psychology
University of Minnesota

Alexander Rothman, PhD
Distinguished University Teaching Professor
Department of Psychology
University of Minnesota

# Featured Research Teams





**Prevalence and correlates of intentional outdoor and indoor tanning among adolescents in the United States: Findings from the FLASHE study**

Zhaomeng Niu, PhD
Postdoctoral Associate
Rutgers Cancer Institute of New Jersey

Jerod Stapleton, PhD
Associate Professor of Medicine
Rutgers Cancer Institute of New Jersey
Rutgers Robert Wood Johnson Medical School

**School contextual correlates of physical activity among a national adolescent sample**

David Berrigan, PhD, MPH
Program Director
Health Behaviors Research Branch
NCI Behavioral Research Program

Lilian Perez, PhD, MPH
Policy Researcher
RAND Corporation
Santa Monica, CA

COLLEGE OF NURSING
UNIVERSITY OF UTAH

# THE EFFECT OF SCREEN VIEWING DURATION AND SELF-EFFICACY IN LIMITING SCREEN VIEWING ON LONELINESS IN ADOLESCENT-PARENT DYADS


***RUMEI YANG, MS***
***EUNJIN LEE TRACY, PHD***
***LAURI LINDER, PHD, APRN, CPON***

# SCREEN VIEWING AMONG ADOLESCENTS AND ADULTS

- Screen viewing (SV): a prevalent form of sedentary behavior (Carson, Pickett, & Janssen, 2011)
  - is detrimental to sleep, interpersonal relationships, mental health, body weight, and
  - contributes to all-cause mortality for adolescents.
- Many adolescents far exceed the recommended two hours per day of recreational screen viewing time (Currie et al., 2008; Rideout, Foehr, & Roberts, 2010; Salmom & Shilton, 2004; Tremblay et al., 2011)

# KNOWLEDGE GAP

- Research assessing the impact of SV on mental health focuses primarily on depression and anxiety
- Loneliness is different from depression and anxiety.
  - Evidence has also shown that loneliness predicts depression, but the reverse is not true (Cacioppo, Hawkley, & Thisted, 2010)

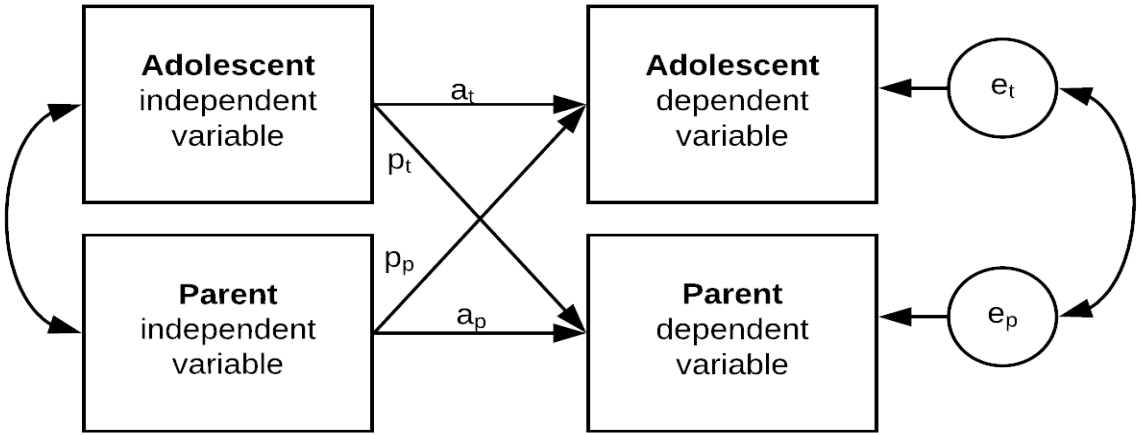
# RELATIONAL CONTEXT OF SV

- Parents are important influences on adolescents' SV and health (Cillero & Jago, 2010)
  - Children whose parents often have SV rules or who role model less SV themselves are less likely to have excessive SV (Bounova, Michalopoulou, Agelousis, Kourtessis & Gourgoulis, 2016)
  - Parental self-efficacy is one form of parental influence that is relatively less studied

# AIMS

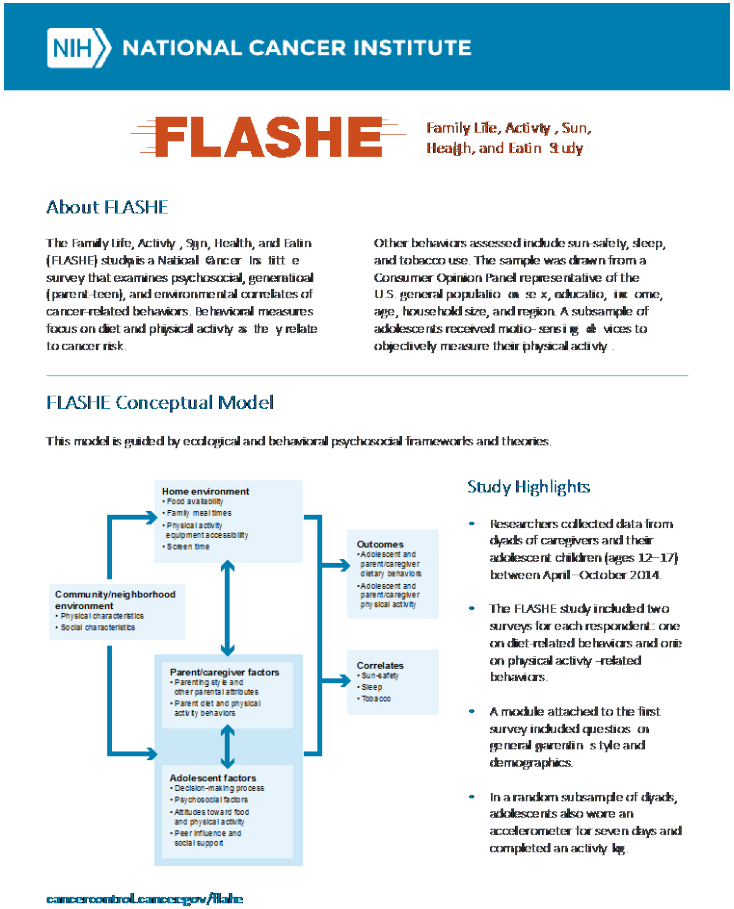
- We used actor-partner interdependence models (APIMs) (Campbell & Kashy, 2002; Cook & Kenny, 2005; Kenny, Kashy, & Cook, 2006)
  - to explore whether both adolescent-parent dyads' SV duration and self-efficacy in limiting SV would be associated with their own and their partner's loneliness, and
  - to compare which dyadic partner exerts a greater influence on the outcome of the other than another does.

# CONCEPTUAL FRAMEWORK



# METHODS

- Data Source and Sample
  - the 2014 Family Life, Activity, Sun, Health, and Eating (FLASHE) study (1,573 dyads)
  - Publicly available data
- Data analysis
  - SPSS, MPLUS



# METHODS

- Measures
  - SV duration
    - Measured on a Likert scale based on number of hours/day
  - Self-efficacy in limiting SV
    - "*I feel confident in my ability to limit how much time I spend using electronic devices*." (1=strongly disagree to 5=strongly agree)
  - Loneliness
    - "*I feel left out.*" (1=never to 5=always)
    - "*I feel isolated from others.*" (1=never to 5=always)
  - Sociodemographic variables

# DEMOGRAPHIC CHARACTERISTICS

1,573 adolescent-parent dyads

- Adolescents
  - Mean 14.5 years (SD=1.61)
  - 50.1% female
  - 63.9% White, non-Hispanic
- Parents
  - 85.8% between 35-59 years of age
  - 75% female
  - 69.7% White, non-Hispanic
  - 72% married
  - 81.3% with at least some college

# RESULTS: *SV DURATION*

| | Parent (n=1,573) | | Adolescents (n=1,573) | | Non-School adolescents (n=88) | | Elementary School adolescents (n=27) | | Middle/High School adolescents (n=1455) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Computer | | | | | | | | | | |
| Not at all | 22 | 1.4 | 263 | 16.7 | 14 | 15.9 | 6 | 22.2 | 257 | 17.7 |
| 2 hours or less per day | 483 | 30.7 | 814 | 51.7 | 36 | 40.9 | 15 | 55.6 | 799 | 54.9 |
| More than 2 hours per day | 1064 | 67.6 | 383 | 24.3 | 37 | 42.0 | 6 | 22.2 | 377 | 25.9 |
| Phone | | | | | | | | | | |
| Not at all | 409 | 26.0 | 348 | 22.1 | 26 | 29.5 | 13 | 48.1 | 335 | 23.0 |
| 2 hours or less per day | 846 | 53.8 | 732 | 46.5 | 44 | 50.0 | 10 | 37.0 | 722 | 49.6 |
| More than 2 hours per day | 306 | 19.5 | 387 | 24.6 | 18 | 20.5 | 3 | 11.1 | 384 | 26.4 |
| Television | | | | | | | | | | |
| Not at all | 60 | 3.8 | 117 | 7.4 | 9 | 10.2 | 3 | 11.1 | 114 | 7.8 |
| 2 hours or less per day | 582 | 37.0 | 793 | 50.4 | 41 | 46.6 | 18 | 66.7 | 775 | 53.3 |
| More than 2 hours per day | 916 | 58.2 | 565 | 35.9 | 38 | 43.2 | 6 | 22.2 | 559 | 38.4 |
| Gaming devices | | | | | | | | | | |
| Not at all | 1046 | 66.5 | 408 | 25.9 | 29 | 33.0 | 6 | 22.2 | 402 | 27.6 |
| 2 hours or less per day | 431 | 27.4 | 718 | 45.6 | 35 | 39.8 | 14 | 51.9 | 704 | 48.4 |
| More than 2 hours per day | 90 | 5.7 | 349 | 22.2 | 24 | 27.3 | 7 | 25.9 | 342 | 23.5 |

# RESULTS: ACTOR AND PARTNER EFFECTS OF SELF-EFFICACY IN LIMITING SCREEN VIEWING ON LONELINESS IN ADOLESCENT-PARENT DYADS

| | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | *β* | *SE* | *t* | *p* | *β* | *SE* | *t* | *p* |
| Intercept for adolescents | 4.15 | 0.05 | 79.82 | .000 | 2.78 | 0.30 | 9.13 | .000 |
| Intercept for parents | 4.24 | 0.05 | 82.21 | .000 | 2.85 | 0.30 | 9.38 | .000 |
| Adolescents | | | | | | | | |
| Actor effect (Adolescents→Adolescents) | | | | | | | | |
| Self-efficacy in limiting screen viewing $a_{t.se}$ | -0.35 | 0.04 | -7.84 | .000 | -0.33 | 0.04 | -7.03 | .000 |
| Partner effect (Adolescents→Parents) | | | | | | | | |
| Self-efficacy in limiting screen viewing $p_{t.se}$ | -0.15 | 0.04 | -3.37 | .001 | -0.13 | 0.04 | -3.06 | .002 |
| Parents | | | | | | | | |
| Actor effect (Parents→Parents) | | | | | | | | |
| Self-efficacy in limiting screen viewing $a_{p.se}$ | -0.25 | 0.05 | -5.31 | .000 | -0.21 | 0.04 | -4.40 | .000 |
| Partner effect (Parents→Adolescents) | | | | | | | | |
| Self-efficacy in limiting screen viewing $p_{p.se}$ | -0.06 | 0.05 | -1.36 | .173 | -0.03 | 0.05 | -0.65 | .516 |

# RESULTS: ACTOR AND PARTNER EFFECTS OF SCREEN VIEWING DURATION ON LONELINESS IN ADOLESCENT-PARENT DYADS

| | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | *β* | *SE* | *t* | *p* | *β* | *SE* | *t* | *p* |
| Intercept for adolescents | 4.18 | 0.06 | 74.74 | .000 | 2.80 | 0.31 | 9.02 | .000 |
| Intercept for parents | 4.25 | 0.06 | 76.94 | .000 | 2.76 | 0.31 | 8.91 | .000 |
| Adolescents | | | | | | | | |
| Actor effect (Adolescents→Adolescents) | | | | | | | | |
| Screen viewing duration $a_{t\text{-}svf}$ | 0.08 | 0.11 | 0.76 | .450 | 0.02 | 0.03 | 0.67 | .500 |
| Partner effect (Adolescents→Parents) | | | | | | | | |
| Screen viewing duration $p_{t\text{-}svf}$ | -0.12 | 0.11 | -1.13 | .260 | -0.03 | 0.03 | -0.95 | .343 |
| Parents | | | | | | | | |
| Actor effect (Parents→Parents) | | | | | | | | |
| Screen viewing duration $a_{p\text{-}svf}$ | 0.11 | 0.12 | 0.88 | .379 | 0.02 | 0.02 | 0.75 | .452 |
| Partner effect (Parents→Adolescents) | | | | | | | | |
| Screen viewing duration $p_{p\text{-}svf}$ | -0.09 | 0.13 | -0.70 | .484 | -0.03 | 0.03 | -1.25 | .213 |

# DISCUSSION

- Actor effects of self-efficacy in limiting SV on loneliness for both adolescents and parents were significant
  - Indicates higher levels of self-efficacy associated with lower levels of loneliness
- Actor effects of SV duration on loneliness within the parent-adolescent dyads were not significant
  - Suggests that each dyadic member's SV duration might not contribute to his or her own loneliness nor their partner's loneliness

# DISCUSSION

- A significant adolescent partner effect was present in which adolescents' self-efficacy in limiting SV had a greater impact on their parents' loneliness than that of parents on adolescents' loneliness
  - A novel finding
- The parents' partner effect was not significant
  - Suggests that parents' self-efficacy in limiting adolescent SV is not associated with adolescent's loneliness

# IMPLICATIONS

- Although parents' self-efficacy in limiting SV did not influence their adolescents' loneliness in this study, parents remain an important source of support for adolescents such as supporting their involvement in social activities
- Parents' self-efficacy in limiting SV may not be a strong external influence on adolescents' loneliness; however, it is still an important internal influence on their own loneliness

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# Questions?

# Interpersonal effects of parents and adolescents on each other's health behaviors: a dyadic extension of the theory of planned behavior

**Keven Joyal-Desmarais** (joyal008@umn.edu), **Alexander J Rothman**

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**Published Article:** doi.org/10.1080/08870446.2018.1549733

**Open-Access Preprint:** osf.io/ksj57

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# Relationships and health behaviors

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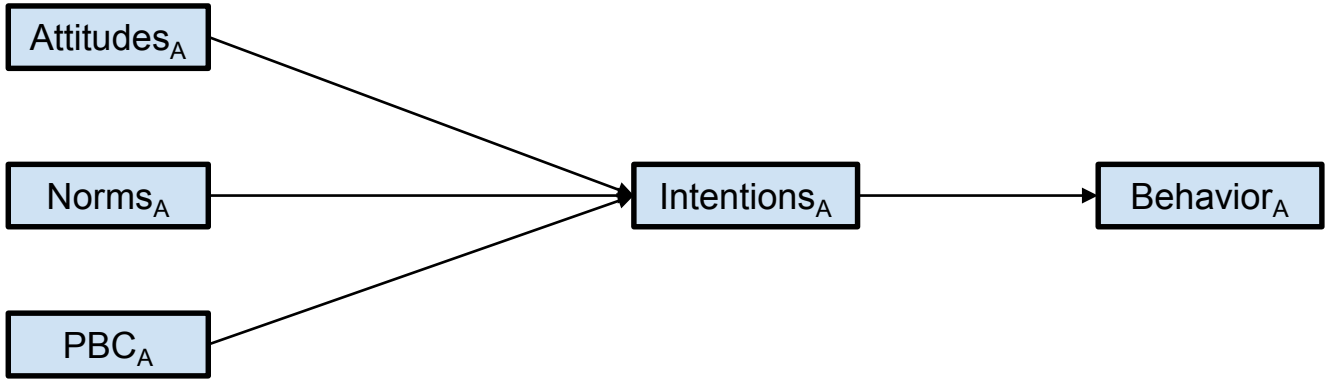
  - E.g., The Theory of Planned Behavior (TPB)[1]




[1]Ajzen, 1985;1991 ;

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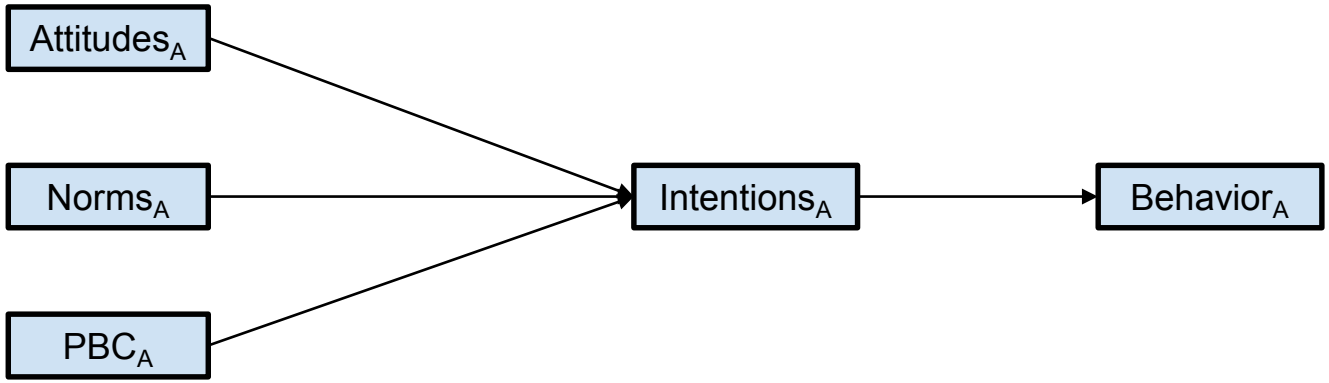


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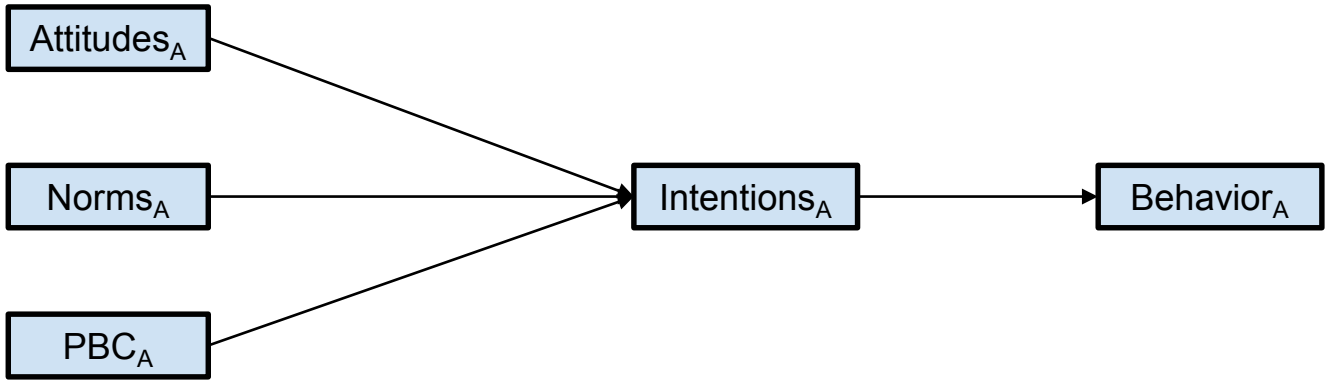
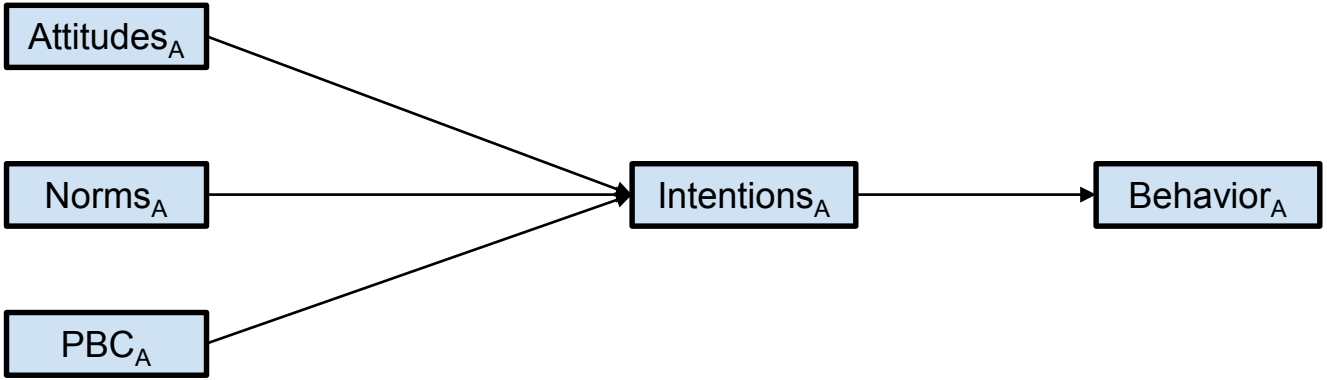



- *Interpersonal* factors are important predictors of health outcomes[2]
  - People influence each other's health behaviors[3]
- **Our goal**: Extend traditionally intrapersonal theory to an interpersonal context

[1]Ajzen, 1985;1991 ; [2]Holt-Lunstad et al., 2010; Holt-Lundstad et al., 2015; [3]Jackson et al., 2015; Lewis & Butterfield, 2007; Martire & Helgeson, 2017 osf.io/ksj57

# Our work[1]: Expanding the TPB




[1]Manne et al., 2012; Howland et al., 2016; Joyal-Desmarais et al., 2019; Lenne et al., 2019

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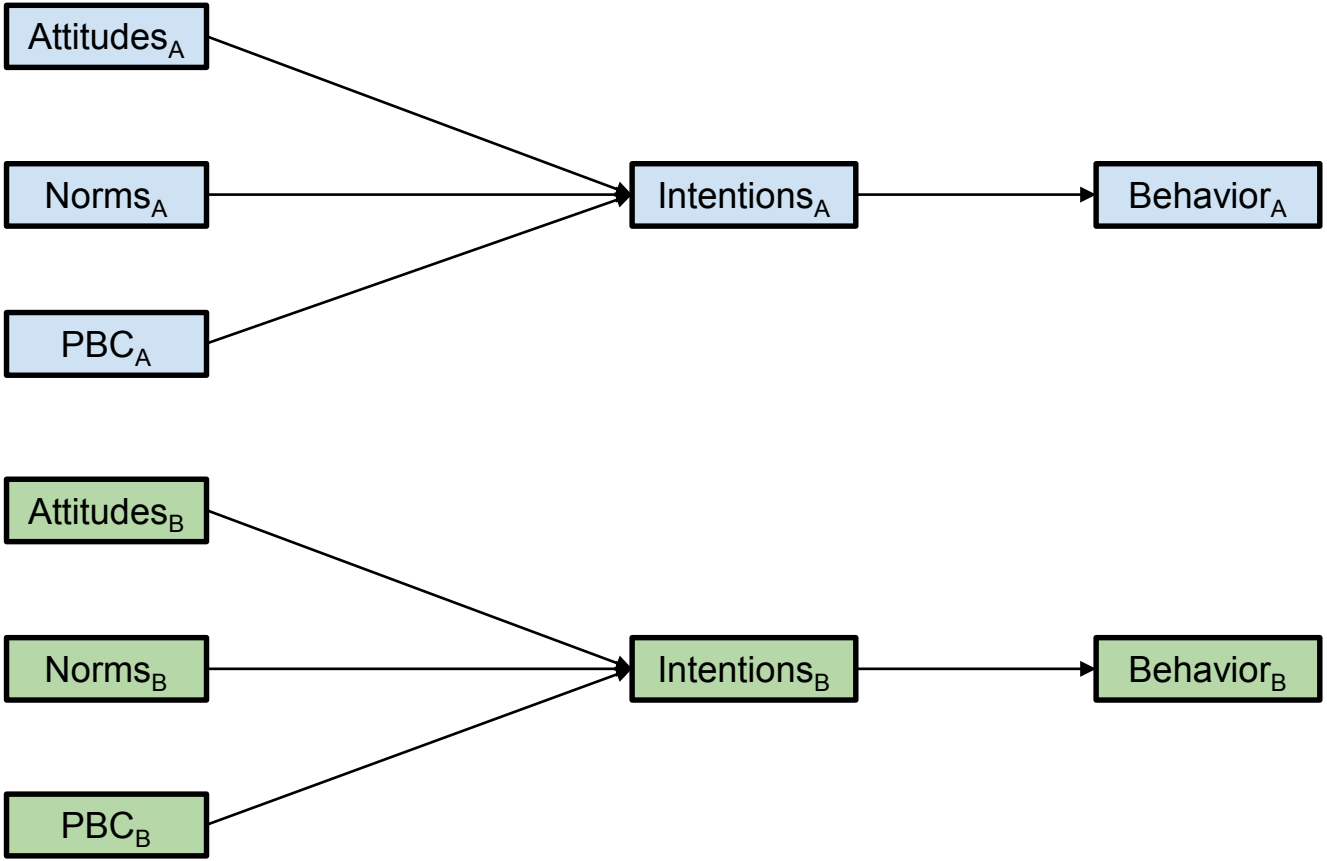


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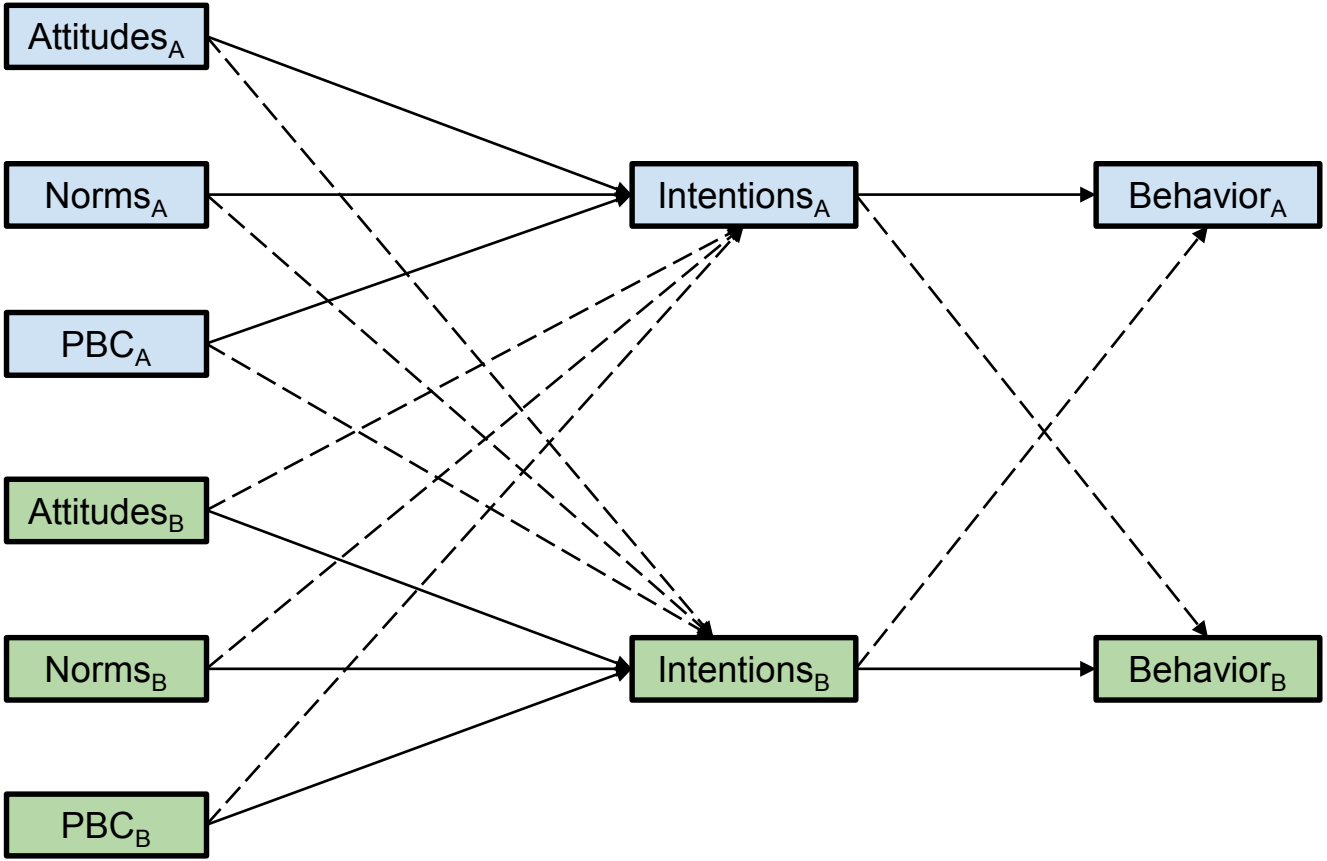


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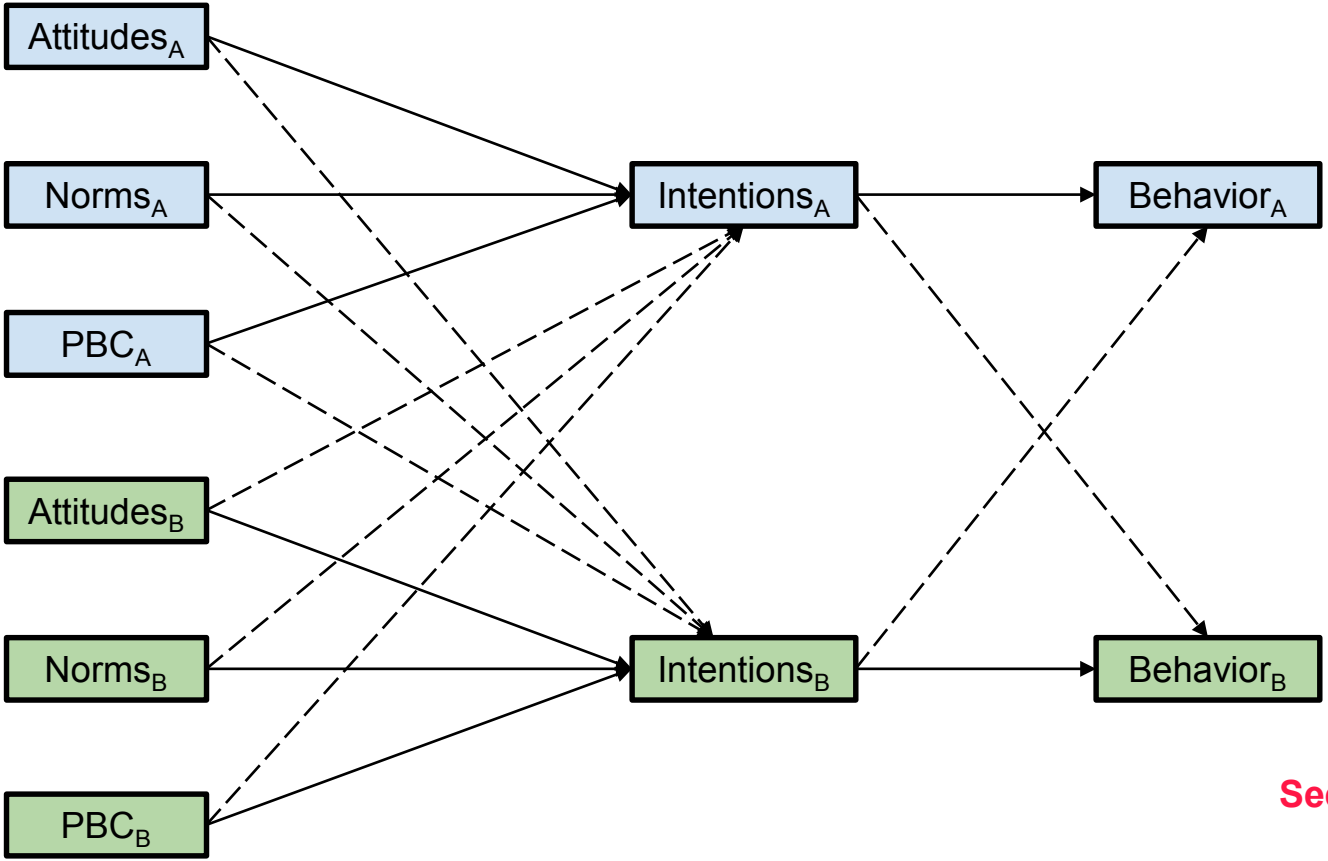


See details

[1]Manne et al., 2012; Howland et al., 2016; Joyal-Desmarais et al., 2019; Lenne et al., 2019

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    - Fruit & vegetable consumption (FV)
    - Junk food & sugary drinks consumption (JF)
    - Physical activity (PA)
    - Screen time sedentary behaviors (SB)

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    - Physical activity (PA)
    - Screen time sedentary behaviors (SB)
  - Website offers numerous resources & documentation files
    - Helpful to plan research (and preregister ideas!)

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# Preregistration (osf.io/a6wdp/)

- Documented variables/items of interest, hypotheses, & analytical plan *before accessing data*

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  - Helps improve credibility of our findings
    - E.g., via increased transparency; guarding against p-hacking, HARKing[1]

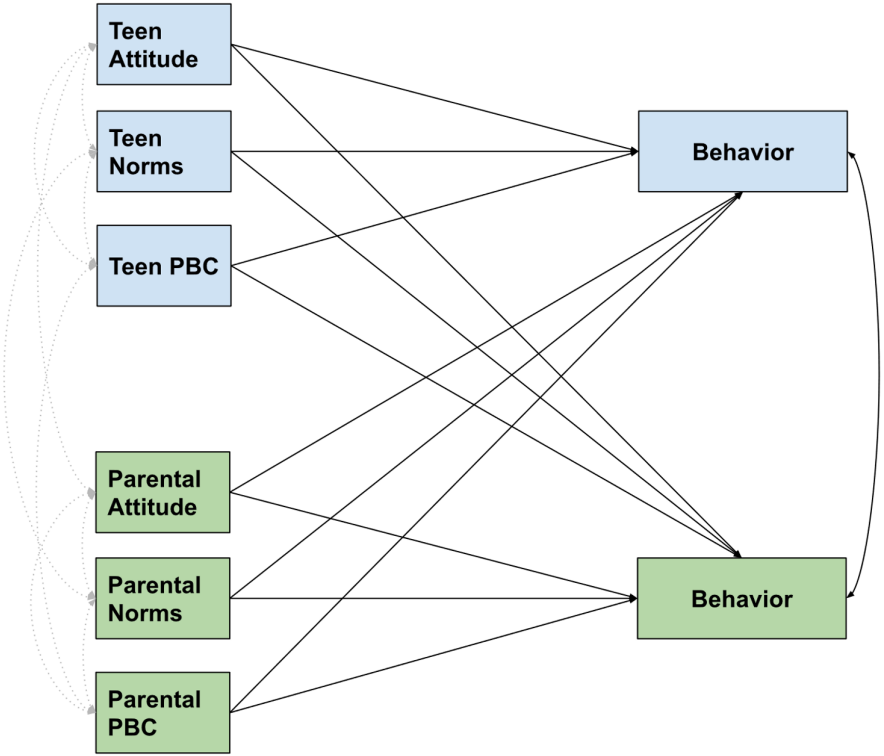
[1]"**H**ypothesizing **A**fter **R**esults are **K**nown"; Helps distinguishes confirmatory from exploratory research

# Preregistration (variables & items)

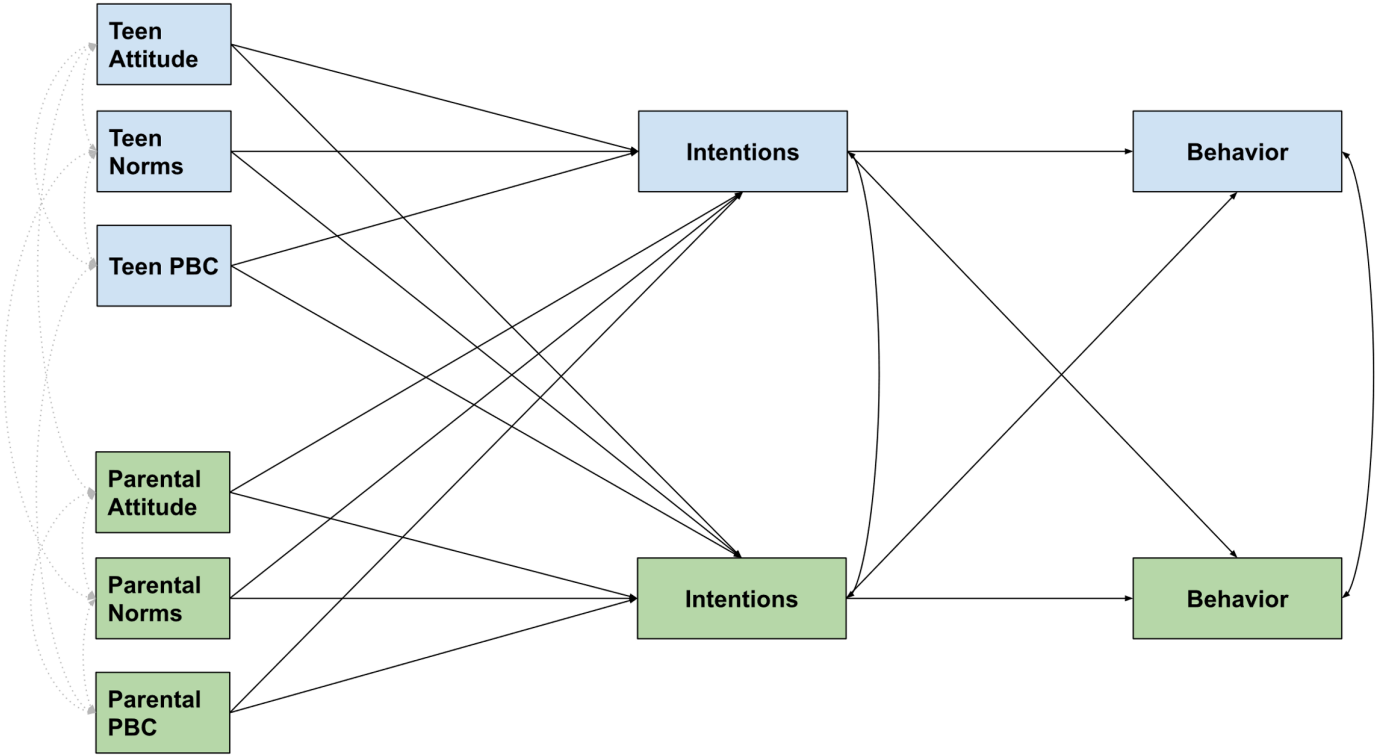
**IV: Fruit and Vegetable Consumption (FV)**

| TPB Beliefs | Respondent | Variable Name | Item |
|---|---|---|---|
| *Norms* | Parent | PDMFVUPST: PD_MotivationFV_ OthersUpset | I would eat fruits and vegetables every day because... others would be upset with me if I didn't. |
| | Teen | TDNORMFB: TD_NormFV | My friends eat fruits and vegetables most days of the week. |
| | | TDMFVUPST: TD_MotivationFV_ OthersUpset | I would eat fruits and vegetables every day because... others would be upset with me if I didn't. |

# Preregistration (a priori analysis plan)



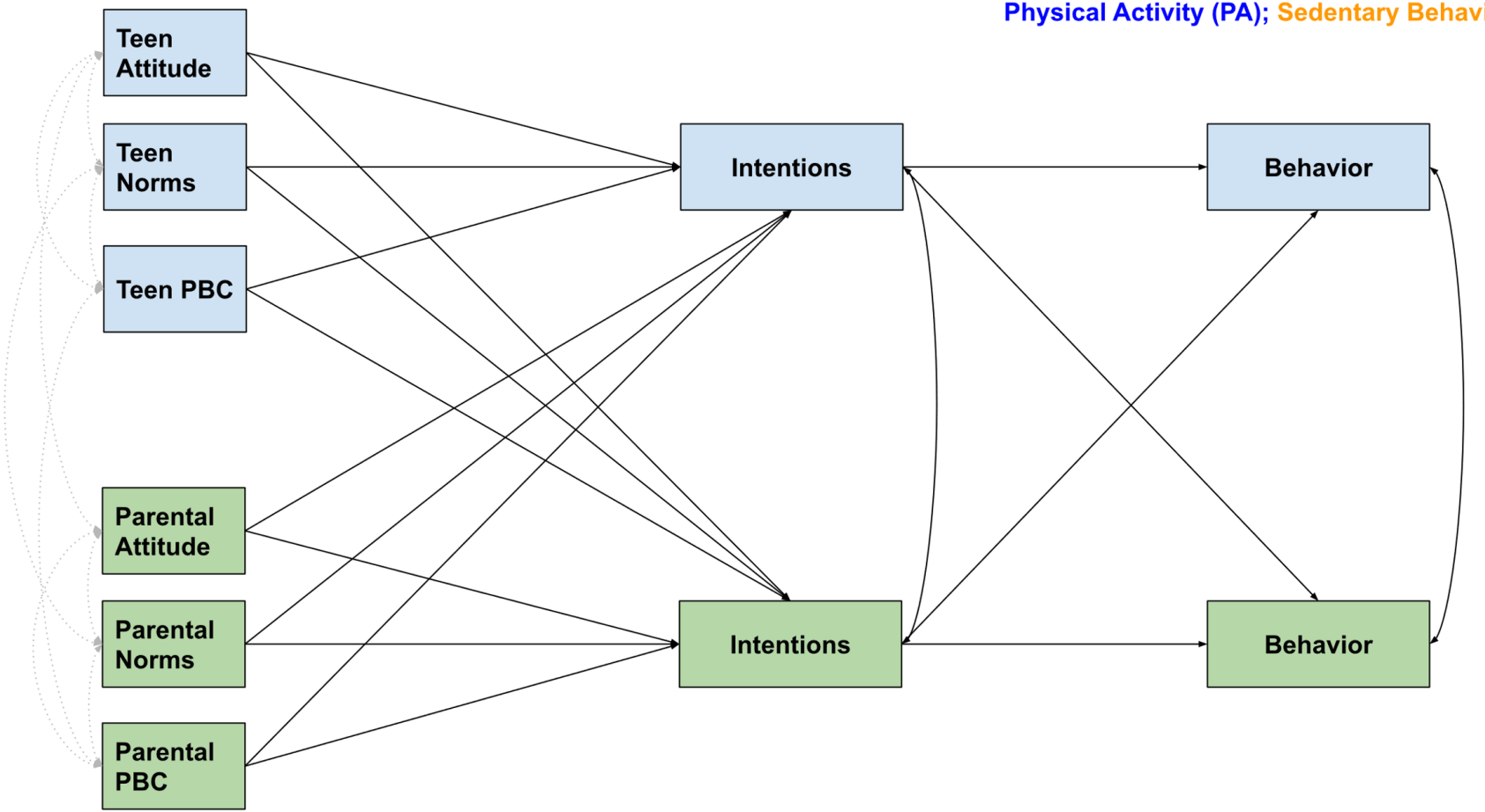
# Preregistration (modified analysis plan)



# What did we find?

(Results of dyadic path analyses)

Fruit and Vegetable (FV); Junk Food/Sugary Drinks (JF);
Physical Activity (PA); Sedentary Behavior (SB)



Fruit and Vegetable (FV); Junk Food/Sugary Drinks (JF);
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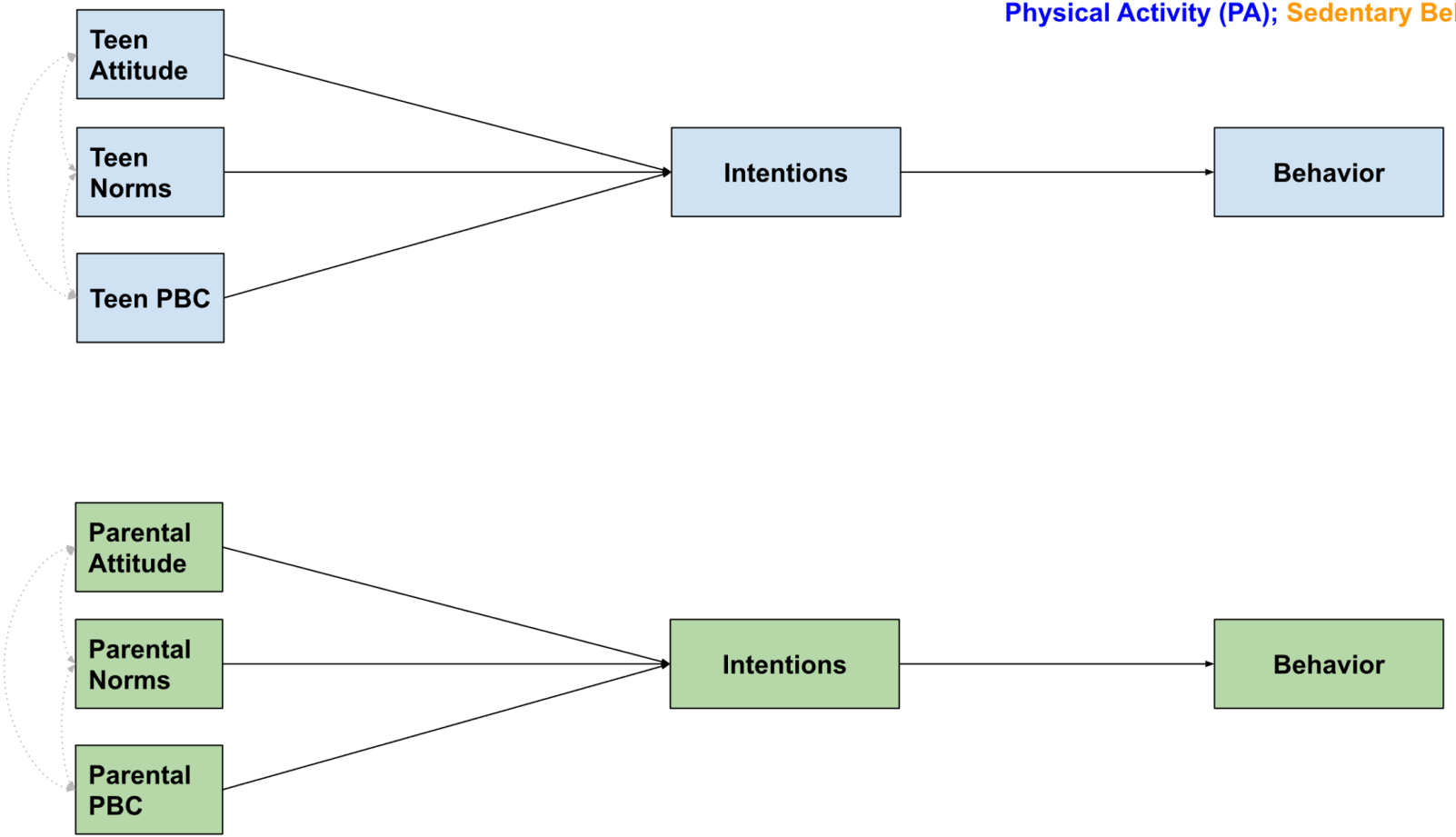

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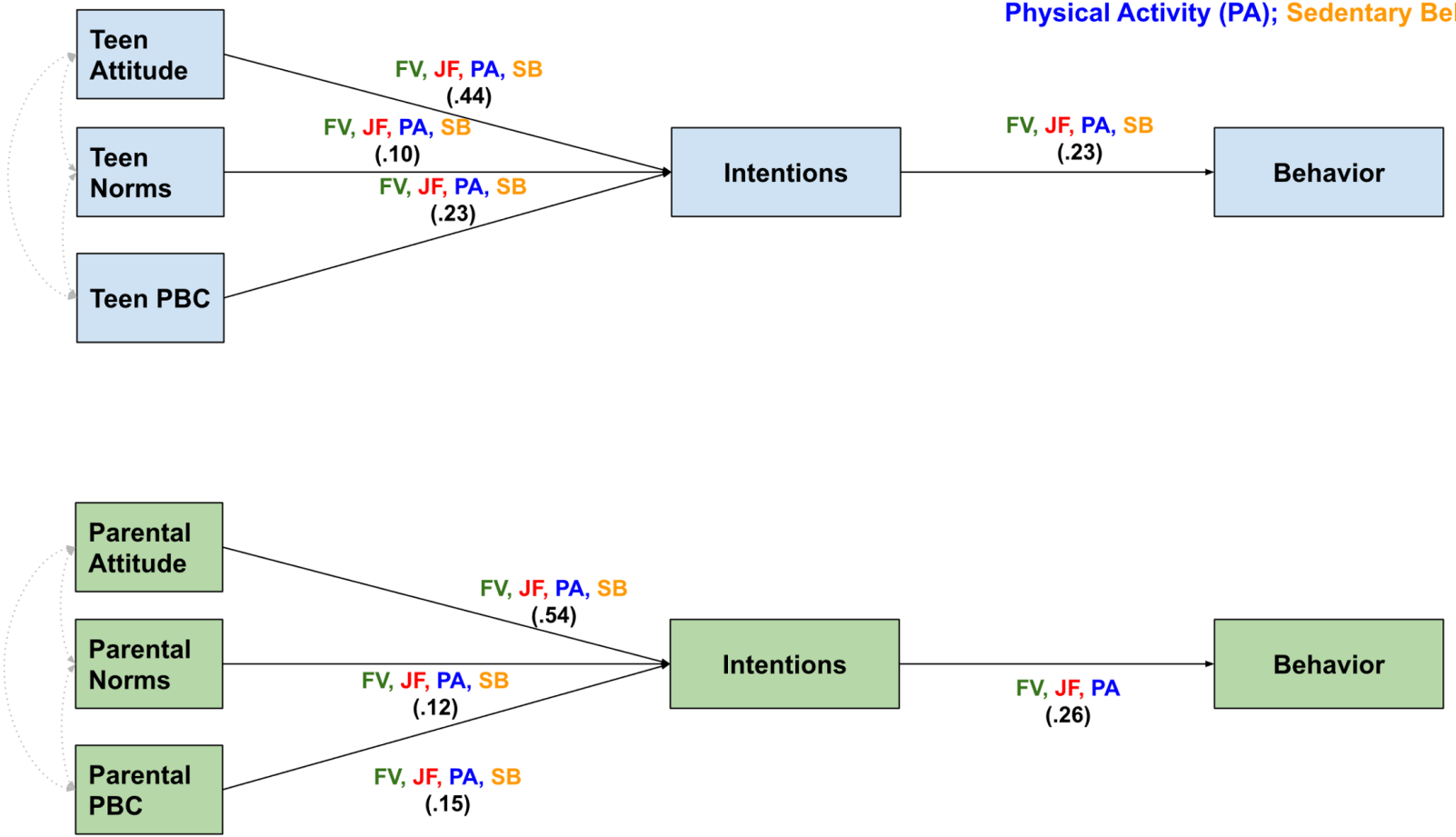
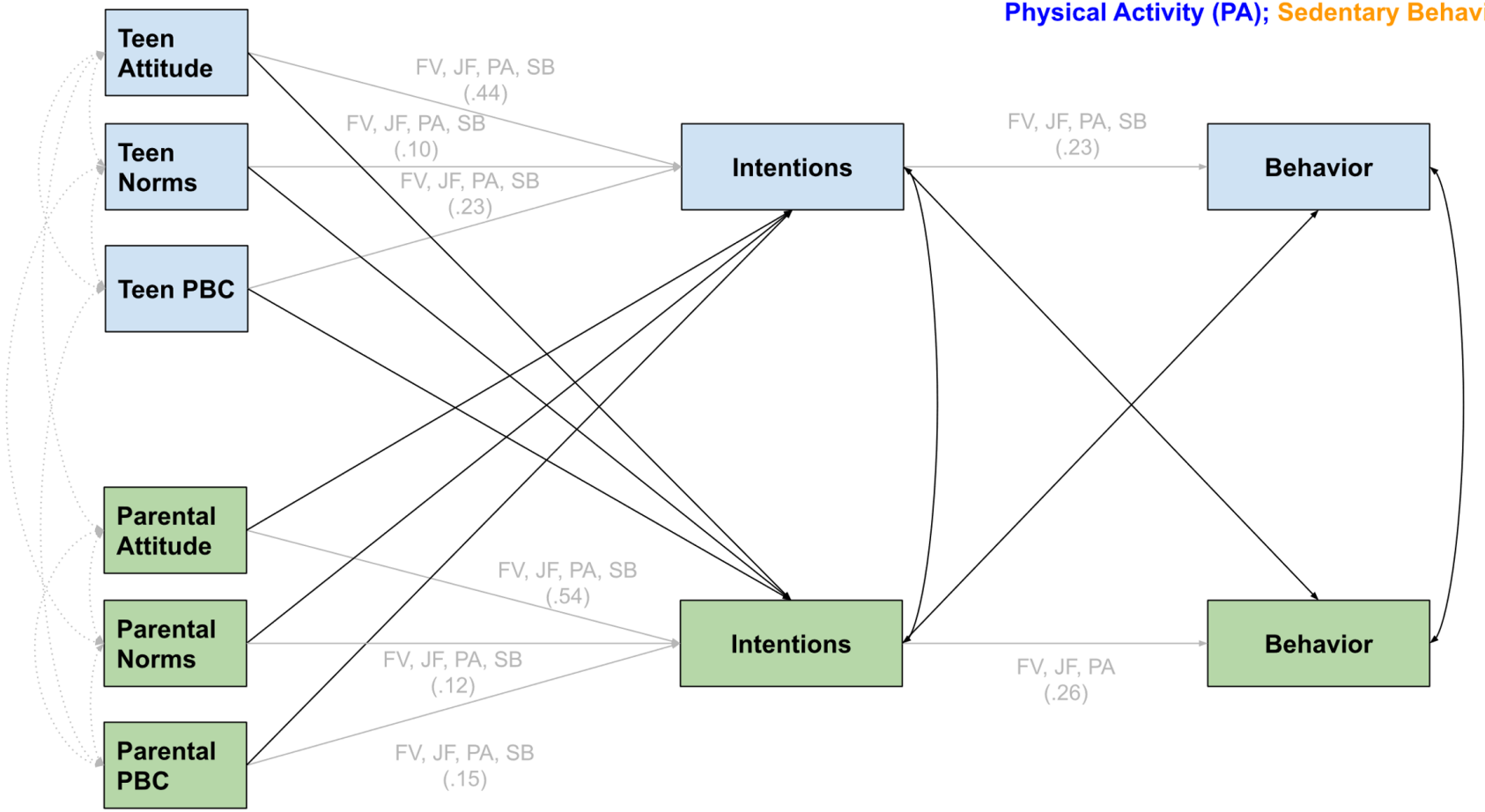



(#s denote average magnitude of significant paths)

Fruit and Vegetable (FV); Junk Food/Sugary Drinks (JF);
Physical Activity (PA); Sedentary Behavior (SB)

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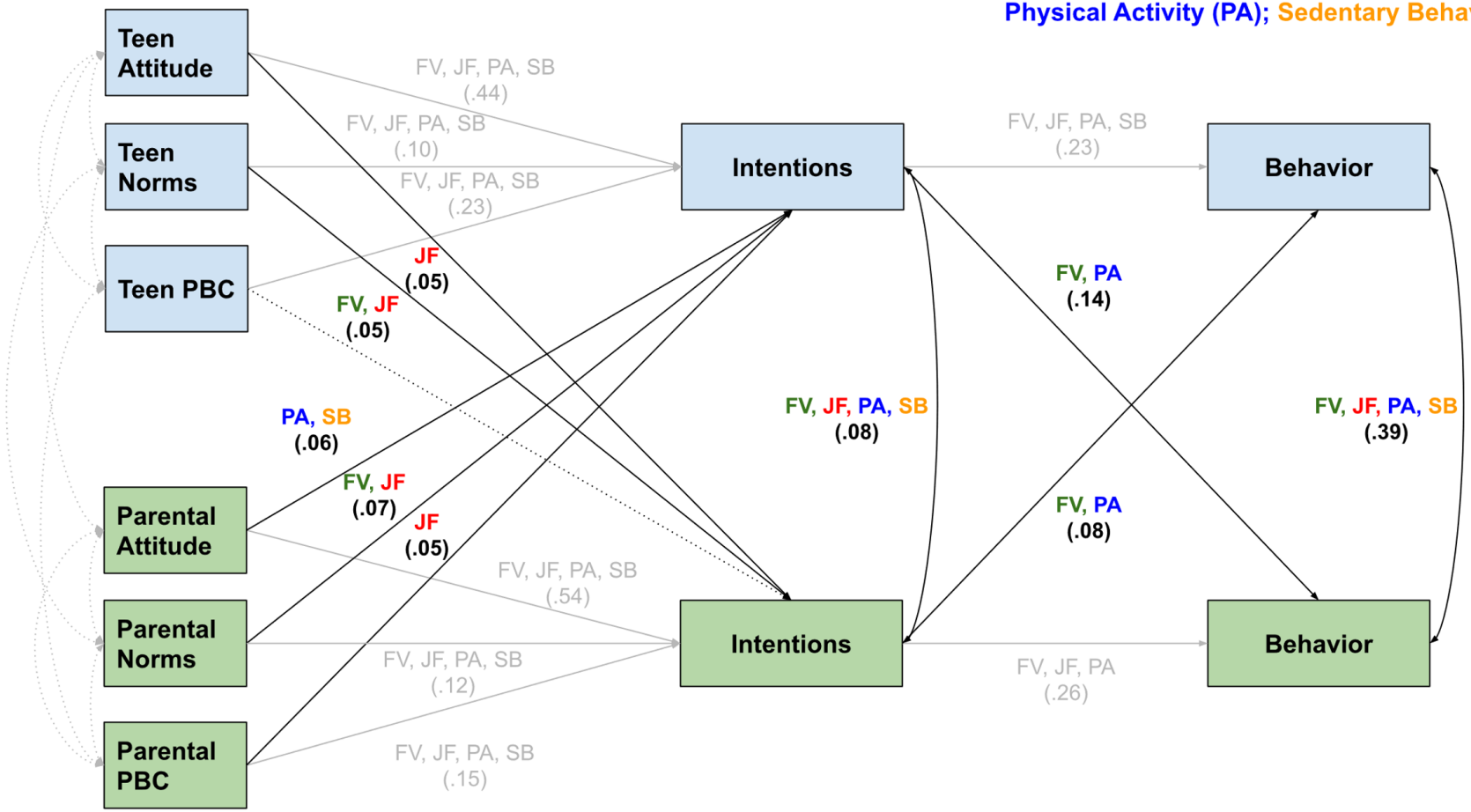


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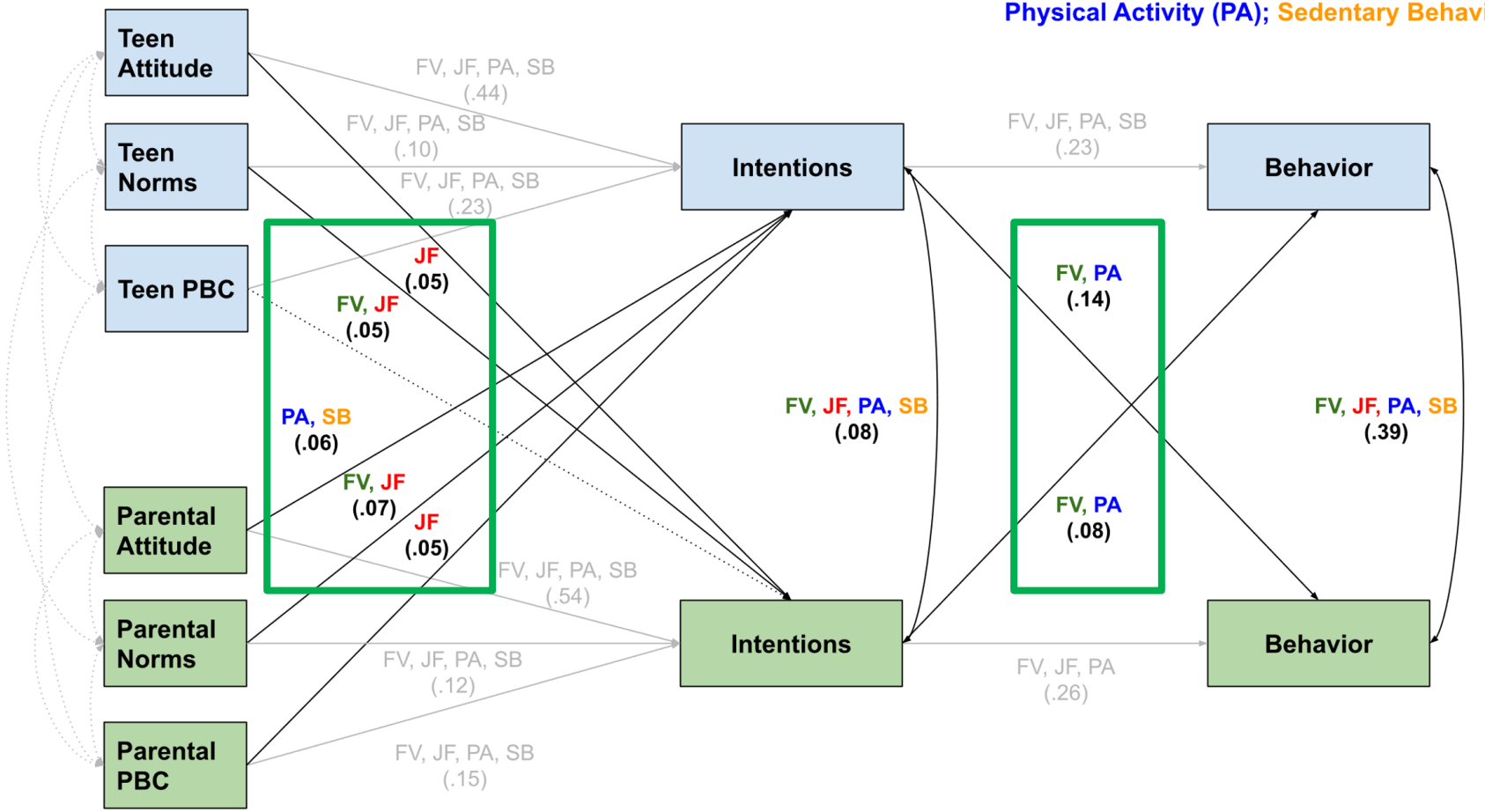


(#s denote average magnitude of significant paths)

# Conclusions

- Evidence classic health behavior models (TPB) can be expanded to consider interpersonal factors
  - Parents/adolescents' characteristics predicted *each other's* intentions & behaviors in *all four* behavior domains

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- Evidence classic health behavior models (TPB) can be expanded to consider interpersonal factors
  - Parents/adolescents' characteristics predicted *each other's* intentions & behaviors in *all four* behavior domains

- Can we design interventions to capitalize on these effects?

- Can we expand other intrapersonal models of behavior?[1,2,3,4,5]
  - Many untapped variables remain in FLASHE data…

[1]Social Cognitive Theory (Bandura, 1991); [2]Health Belief Model (Rosenstock, 1974); [3]Transtheoretical Model (Prochaska & Velicer, 1997); [4]Health Action Process Approach (Schwarzer et al., 2011); [5]Self-Determination Theory (Ryan & Deci, 2000)

# OSF Project Page: osf.io/x3jav/

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**Study Articles and Preprints:**

1. Interpersonal Effects of Parents and Adolescents on Each Other's Health Behaviours: A Dyadic Extension of the Theory of Planned Behaviour. Article: doi.org/10.1080/08870446.2018.1549733. Preprint: 10.17605/OSF.IO/KSJ57.
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Preregistration: osf.io/a6wdp/

Analysis code (R)

# OSF Project Page: osf.io/x3jav/

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- **osf.io/ksj57** (dyadic TPB)
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Preregistration: osf.io/a6wdp/

Analysis code (R)

# Questions?

RUTGERS
Cancer Institute
of New Jersey
RUTGERS HEALTH

# Prevalence and Correlates of Intentional Outdoor and Indoor Tanning among Adolescents in the United States: Findings from the FLASHE Survey


Zhaomeng Niu, Ph.D.
Postdoctoral Associate
Rutgers Cancer Institute of New Jersey

Jerod Stapleton, Ph.D.
Associate Professor of Medicine
Rutgers Cancer Institute of New Jersey
Robert Wood Johnson Medical School
Rutgers School of Public Health


NCI Comprehensive Cancer Center
A Cancer Center Designated by the National Cancer Institute

# Acknowledgement

Elliot J. Coups

Baichen Xu

Veenat Parmar

Niu Z, Parmar V, Xu B, Coups EJ, Stapleton JL. Prevalence and correlates of intentional outdoor and indoor tanning among adolescents in the United States: Findings from the FLASHE survey. Preventive medicine reports. 2018 Sep 1;11:187-90.

# SKIN CANCER IS A SIGNIFICANT PUBLIC HEALTH ISSUE

- Basal cell carcinoma = 4.3 Million cases
- Squamous cell carcinoma = 1 Million cases and 15,000 deaths
- Melanoma = 96,000 cases and 7,230 deaths

**Estimated New Cases**

| Males | | | | Females | | |
|---|---|---|---|---|---|---|
| Prostate | 174,650 | 20% |  | Breast | 268,600 | 30% |
| Lung & bronchus | 116,440 | 13% | | Lung & bronchus | 111,710 | 13% |
| Colon & rectum | 78,500 | 9% | | Colon & rectum | 67,100 | 8% |
| Urinary bladder | 61,700 | 7% | | Uterine corpus | 61,880 | 7% |
| Melanoma of the skin | 57,220 | 7% | | Melanoma of the skin | 39,260 | 4% |
| Kidney & renal pelvis | 44,120 | 5% | | Thyroid | 37,810 | 4% |
| Non-Hodgkin lymphoma | 41,090 | 5% | | Non-Hodgkin lymphoma | 33,110 | 4% |
| Oral cavity & pharynx | 38,140 | 4% | | Kidney & renal pelvis | 29,700 | 3% |
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| Pancreas | 29,940 | 3% | | Leukemia | 25,860 | 3% |
| **All Sites** | **870,970** | **100%** | | **All Sites** | **891,480** | **100%** |

Siegel, R. L., Miller, K. D., & Jemal, A., 2019

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Siegel, R. L., Miller, K. D., & Jemal, A., 2019

# INDOOR AND OUTDOOR TANNING AND MELANOMA

- Exposure to ultraviolet radiation is a major factor that leads to skin cancer (melanoma and non-melanoma).
- The biggest increase of melanoma incidence in recent decades has been found among girls aged 15-19.
- Lack of research on indoor and outdoor tanning rates and factors associated with tanning among adolescents.


Cust et al., 2011; Purdue et al., 2008; Wehner et al., 2012; 2014

# POTENTIAL FACTORS ASSOCIATED WITH TANNING

- Media use
- Emotional status
- Demographics

# Research questions

1. What is the prevalence of the intentional outdoor and indoor tanning among adolescents i the United States?

2. What is the association between media use and intentional outdoor and indoor tanning behaviors among adolescents in the United States?

3. What is the association between emotional status and intentional outdoor and indoor tanning behaviors among adolescents in the United States?

# METHOD

FLASHE Family Life, Activity, Sun, Health, and Eating Study

Data: NCI-administered FLASHE survey

N = 1737

Participants:

- 12-17 years old

**Measures:**

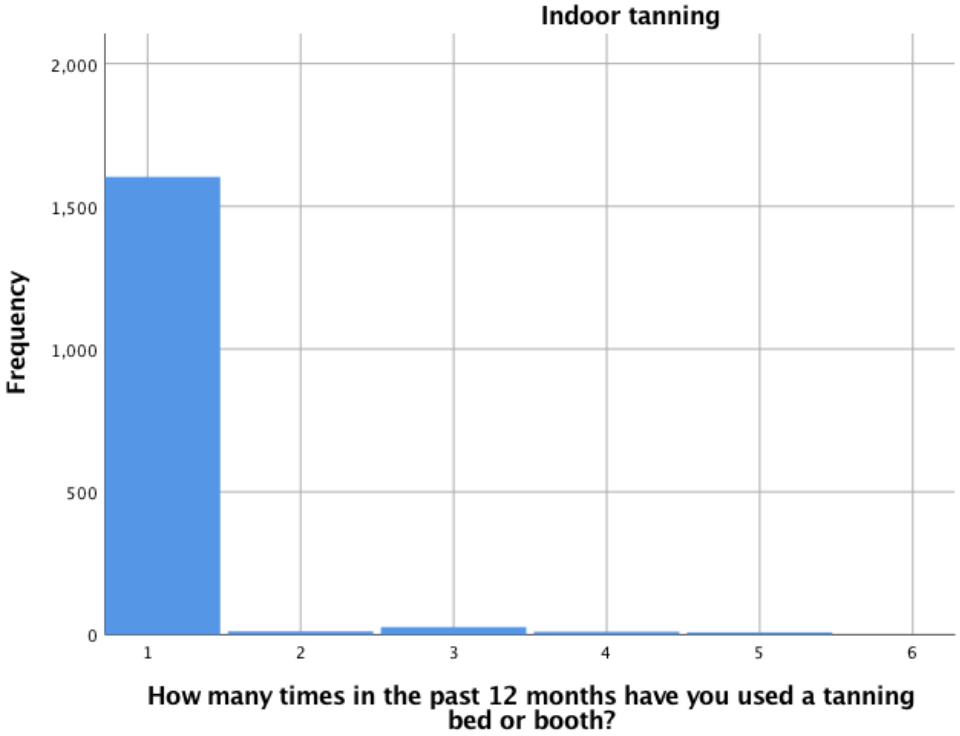
- Outcomes: indoor and outdoor tanning
- Correlates: age, sex, race/ethnicity, school type, emotional status, media use

# Measurement

## Indoor tanning

How many times in the past 12 months have you used a tanning bed or booth?

1. 0 times
2. 1-2 times
3. 3-10 times
4. 11-24 times
5. 25 times or more 6 Don't know



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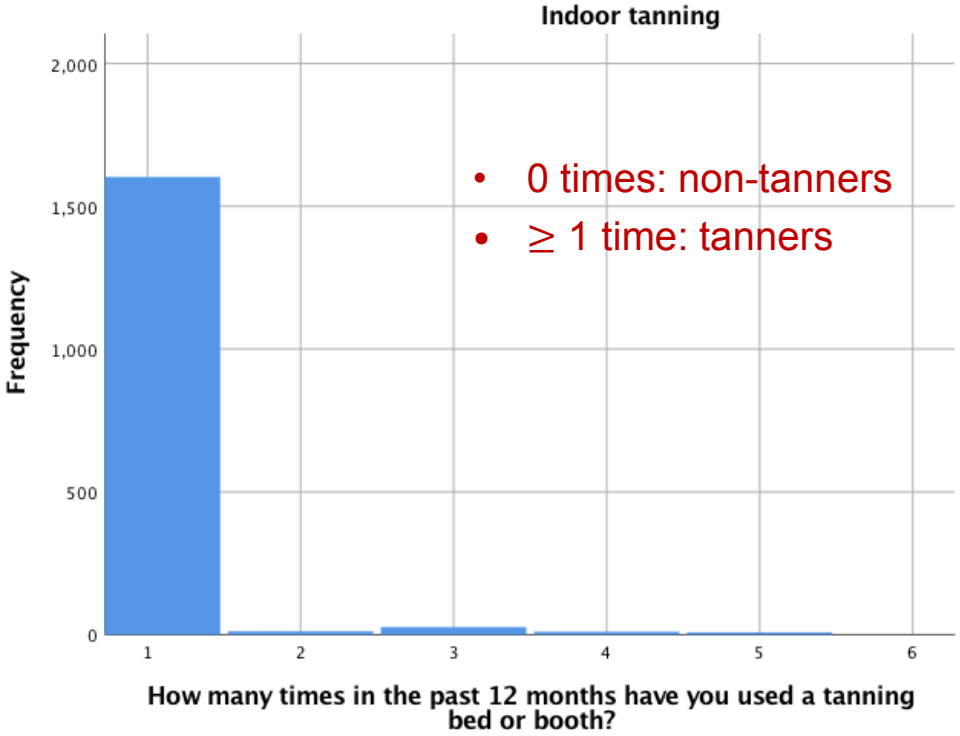
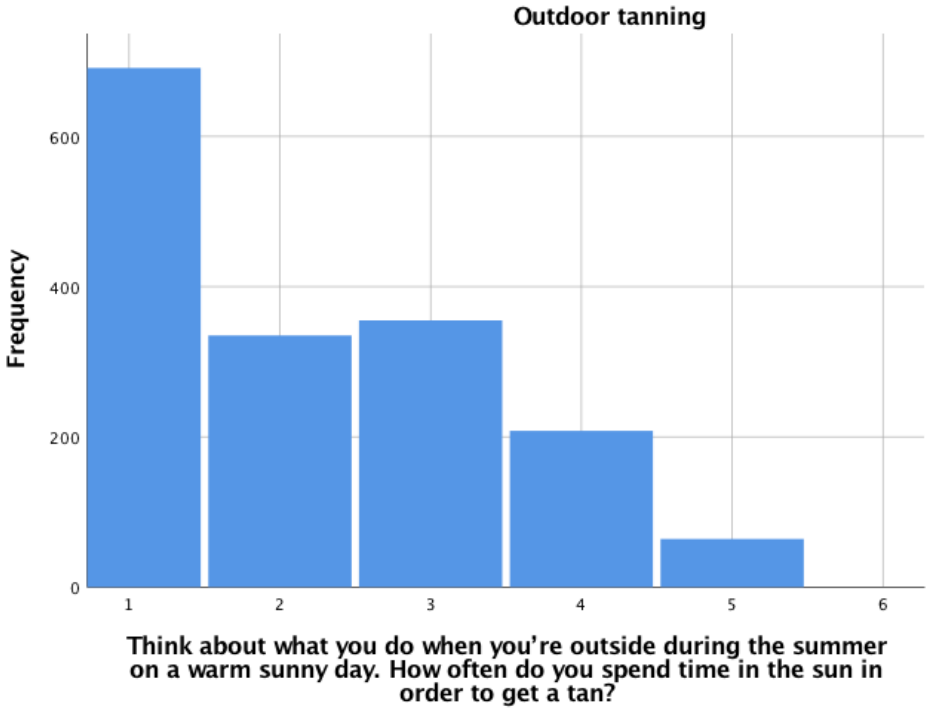


# Outdoor tanning

Think about what you do when you're outside during the summer on a warm sunny day. How often do you spend time in the sun in order to get a tan?

1. Never
2. Rarely
3. Sometimes
4. Often
5. Always



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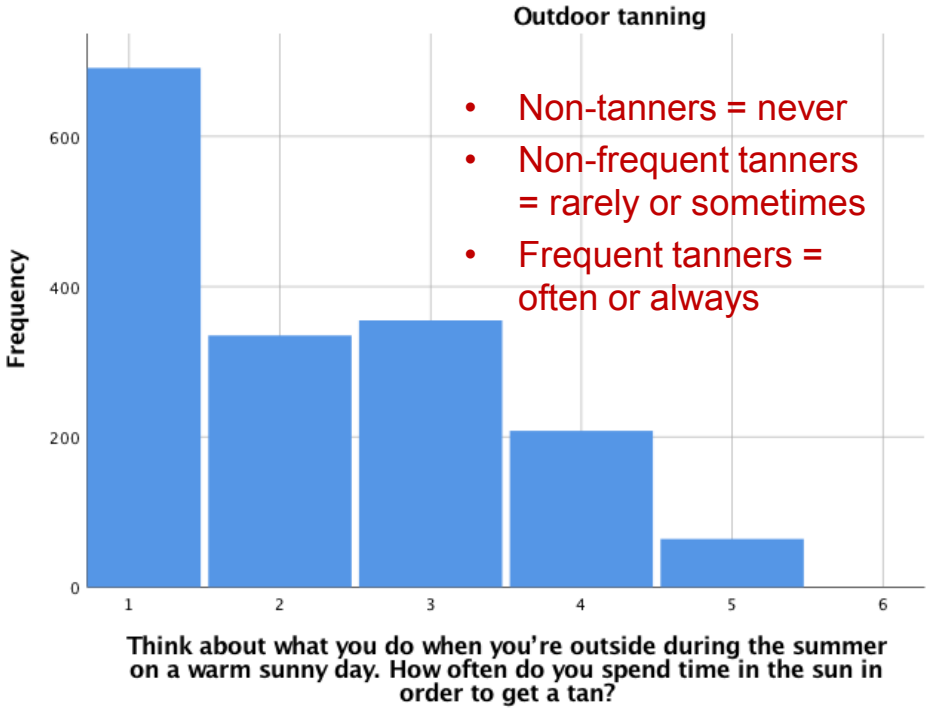


- Non-tanners = never
- Non-frequent tanners = rarely or sometimes
- Frequent tanners = often or always

# Media use

- Time spent watching TV, using computers, and using their cell phone

How much time did you spend using COMPUTERS? This includes time on Facebook as well as time spent surfing the internet, instant messaging, playing online video games or computer games.

1. I didn't really use the computer at all
2. I used a computer less than 1 hour per day
3. I used a computer 1 to 2 hours per day
4. I used a computer 2 to 3 hours per day
5. I used a computer more than 3 hours per day

# RESULTS

**Table 1**
Unweighted sample characteristics and weighted percentages of U.S. adolescents who intentionally tan outdoors and indoors, FLASHE 2014.

| | Total sample unweighted | Outdoor tanning | | | Indoor tanning in the past 12 months | |
|---|---|---|---|---|---|---|
| | | Non-tanners[a] ($n$ = 660) | Non-frequent tanners[b] ($n$ = 637) | Frequent tanners[c] ($n$ = 240) | 0 times ($n$ = 1497) | ≥1 time ($n$ = 47) |
| | N (%) | % (95% CI) | % (95% CI) | % (95% CI) | % (95% CI) | % (95% CI) |
| Total | 1737 | 42.9 (40.5, 45.4) | 42.2 (39.7, 44.6) | 14.9 (13.1, 16.7) | 97.0 (96.2, 97.9) | 3.0 (2.1, 3.8) |
| Sex | | | | | | |
| Male | 835 (49.8) | 52.4 (48.8, 55.9) | 39.0 (35.5, 42.4) | 8.6 (6.7, 10.6) | 97.3 (96.2, 98.5) | 2.7 (1.5, 3.8) |
| Female | 778 (50.2) | 33.4 (30.1, 36.7) | 45.4 (41.9, 48.9) | 21.2 (18.3, 24.1) | 96.7 (95.5, 98.0) | 3.3 (2.0, 4.5) |
| School type | | | | | | |
| Public school | 1417 (84.3) | 42.1 (39.4, 44.8) | 43.0 (40.3, 45.7) | 14.9 (12.9, 16.8) | 97.2 (96.3, 98.1) | 2.8 (1.9, 3.7) |
| Private school | 121 (7.2) | 39.3 (30.1, 48.5) | 42.0 (32.7, 51.3) | 18.8 (11.4, 26.1) | 96.3 (92.7, 99.8) | 3.7 (0.2, 7.3) |
| Home-schooled/another kind of school | 143 (8.5) | 53.9 (45.4, 62.4) | 33.9 (25.9, 42.0) | 12.2 (6.6, 17.7) | 95.9 (92.5, 99.3) | 4.1 (0.7, 7.5) |
| Age (years) | | | | | | |
| 12–13 | 560 (33.3) | 47.5 (43.1, 51.9) | 39.4 (35.1, 43.7) | 13.1 (10.1, 16.1) | 97.4 (96.0, 98.8) | 2.6 (1.2, 4.0) |
| 14–15 | 585 (34.8) | 41.0 (36.7, 45.3) | 43.8 (39.5, 48.1) | 15.2 (12.1, 18.3) | 97.9 (96.7, 99.2) | 2.1 (0.8, 3.3) |
| 16–17 | 537 (31.9) | 40.4 (36.2, 44.6) | 43.3 (39.1, 47.5) | 16.3 (13.2, 19.4) | 95.9 (94.3, 97.6) | 4.1 (2.4, 5.7) |
| Race/ethnicity | | | | | | |
| Non-Hispanic White | 1061 (63.7) | 34.6 (31.4, 37.8) | 46.4 (43.0, 49.7) | 19.0 (16.4, 21.6) | 96.8 (95.7, 98.0) | 3.2 (2.0, 4.3) |
| Other | 605 (36.3) | 53.2 (49.5, 56.9) | 37.0 (33.4, 40.6) | 9.8 (7.6, 12.0) | 97.3 (96.1, 98.5) | 2.7 (1.4, 4.1) |

Note. CI, confidence interval.
Variations in the sample size are due to missing data.
[a] Respondents who reported “never”.
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# RESULTS

**Table 2**
Unadjusted and adjusted odds ratios of U.S. adolescents who intentionally tan outdoors and indoors, FLASHE 2014.

| | Outdoor tanning | | | | Indoor tanning in the past 12 months | |
|---|---|---|---|---|---|---|
| | Non-frequent tanners compared to non-tanners | | Frequent tanners compared to non-tanners | | | |
| | Unadjusted OR (95% CI) | Adjusted OR[a] (95% CI) | Unadjusted OR (95% CI) | Adjusted OR[a] (95% CI) | Unadjusted OR (95% CI) | Adjusted OR[a] (95% CI) |
| Age (years) | **1.08 (1.01, 1.16)*** | 1.05 (0.98, 1.13) | **1.11 (1.01, 1.21)*** | 1.04 (0.94, 1.16) | 1.12 (0.93, 1.34) | 1.00 (0.82, 1.21) |
| Sex | | | | | | |
| Male | Ref | Ref | Ref | Ref | Ref | Ref |
| Female | **1.83 (1.47, 2.28)***** | **1.74 (1.38, 2.18)***** | **3.84 (2.77, 5.31)***** | **3.25 (2.31, 4.58)***** | 1.23 (0.68, 2.23) | 0.89 (0.48, 1.66) |
| Race/ethnicity | | | | | | |
| Other | Ref | Ref | Ref | Ref | Ref | Ref |
| Non-Hispanic White | **1.93 (1.55, 2.40)***** | **2.08 (1.65, 2.61)***** | **2.98 (2.16, 4.12)***** | **3.42 (2.42, 4.84)***** | 1.18 (0.65, 2.16) | 1.33 (0.71, 2.51) |
| School type | | | | | | |
| Public school | Ref | Ref | Ref | Ref | Ref | Ref |
| Private school | 1.05 (0.68, 1.61) | 1.05 (0.67, 1.65) | 1.35 (0.78, 2.35) | 1.41 (0.78, 2.54) | 1.36 (0.48, 3.87) | 1.49 (0.52, 4.33) |
| Home-schooled/another kind of school | 0.62 (0.42, 0.91) | 0.61 (0.40, 0.91) | 0.64 (0.36, 1.13) | 0.66 (0.36, 1.21) | 1.50 (0.60, 3.77) | 1.39 (0.52, 3.67) |
| Emotional status | 1.06 (0.95, 1.19) | 1.03 (0.92, 1.16) | **1.19 (1.03, 1.38)*** | 1.01 (0.88, 1.16) | **1.43 (1.09, 1.87)**** | 1.32 (1.00, 1.75) |
| Time spent watching TV | 1.08 (0.99, 1.19) | 1.07 (0.97, 1.18) | 1.10 (0.97, 1.25) | 1.08 (0.92, 1.27) | 1.24 (0.96, 1.61) | 1.03 (0.80, 1.34) |
| Time spent using computers | 1.01 (0.93, 1.09) | 0.99 (0.90, 1.08) | 0.92 (0.82, 1.03) | 0.89 (0.78, 1.01) | **1.46 (1.16, 1.83)**** | **1.34 (1.06, 1.70)*** |
| Time spent using a cell phone | **1.20 (1.11, 1.30)***** | **1.17 (1.06, 1.28)***** | **1.51 (1.35, 1.69)***** | **1.47 (1.30, 1.66)***** | **1.59 (1.28, 1.97)***** | **1.56 (1.23, 1.96)***** |

Note. CI, confidence interval; OR, odds ratio.
[a] Multivariable analysis included all displayed factors and was based on the weighted population of the study.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

# RESULTS

**Table 2**
Unadjusted and adjusted odds ratios of U.S. adolescents who intentionally tan outdoors and indoors, FLASHE 2014.

| | Outdoor tanning | | | | Indoor tanning in the past 12 months | |
|---|---|---|---|---|---|---|
| | Non-frequent tanners compared to non-tanners | | Frequent tanners compared to non-tanners | | | |
| | Unadjusted OR (95% CI) | Adjusted OR[a] (95% CI) | Unadjusted OR (95% CI) | Adjusted OR[a] (95% CI) | Unadjusted OR (95% CI) | Adjusted OR[a] (95% CI) |
| Age (years) | **1.08 (1.01, 1.16)*** | 1.05 (0.98, 1.13) | **1.11 (1.01, 1.21)*** | 1.04 (0.94, 1.16) | 1.12 (0.93, 1.34) | 1.00 (0.82, 1.21) |
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| Male | Ref | Ref | Ref | Ref | Ref | Ref |
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[a] Multivariable analysis included all displayed factors and was based on the weighted population of the study.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

# CONCLUSIONS

- FLASHE data for skin cancers
- Things to consider regarding the outcome variables
- Relabel the correlates

# Thank you!

# Questions?

# Adolescent school-related physical activity:
## Opportunities and barriers at the policy and school neighborhood levels

Perez et al. Prev Med Rep 2019 Feb 27;14:100835
Tribby et al. 2019. Submitted

NIH NATIONAL CANCER INSTITUTE

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April Oh
Laura A Dwyer
Frank M Perna
Calvin Tribby
David Berrigan
September 26th 2019

# Physical activity (PA) in adolescence has many health benefits

## Short term

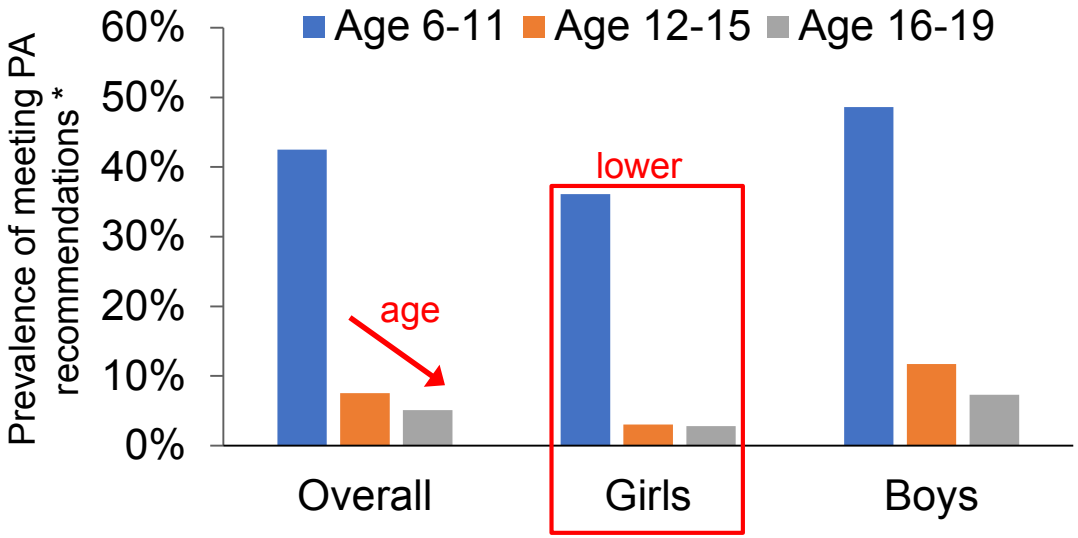
- Bone and mental (depression) health
- Improvements on asthma from swimming
- Possible effects on obesity treatment


## Long term

- Physical activity tracks into adulthood
- Bone fracture prevention
- Reduced risk of breast cancer
- Sedentary lifestyle and poor fitness in early years related to CVD risk factors in adulthood


Hallal et al, Sports Med 2006; Rosimini, JAANP 2003; Summerbell et al, CDSR 2003 ; Telama, Obes Facts 2009; Karlsson, JMNI 2004; Okasha et al, BCRT 2003

# Older adolescents and girls are less physically active




* **≥ 60 min/day of moderate- to vigorous-physical activity** on ≥5 days of the week, based on accelerometry.

Physical Activity Guidelines for Americans, 2008; Belcher et al. 2010; Report Card on Physical Activity for Children and Youth, 2016

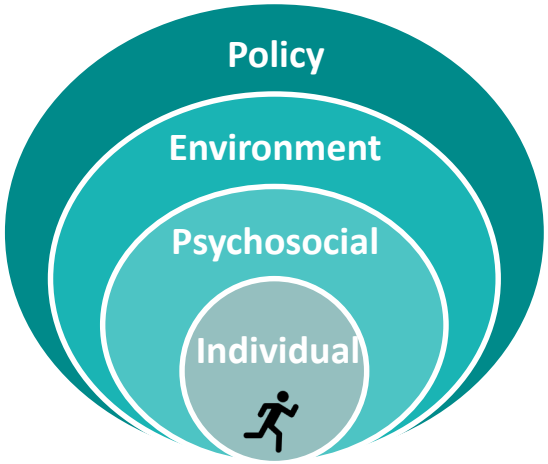
# High school adolescents report less school-time PA and active transport to/from school

- School-time PA and active transport to/from school can contribute to overall PA.
- Most adolescents do not adhere to IOM guidelines on achieving at least half of recommended **PA during school hours**:
  - High school adolescents: 8% of recommended PA in school (~ 5 min/day)
  - Middle school adolescents: 25% of recommended PA in school (~ 15 min/day)
- Prevalence of **active transport to/from school** among high school adolescents is about half (8%) that of middle school adolescents (15%).

Chillon et al, PES 2011; IOM 2013; McDonald, AJPM 2007

# Why are some youth physically active and others not?

Ecologic models propose PA is influenced by factors at multiple levels.



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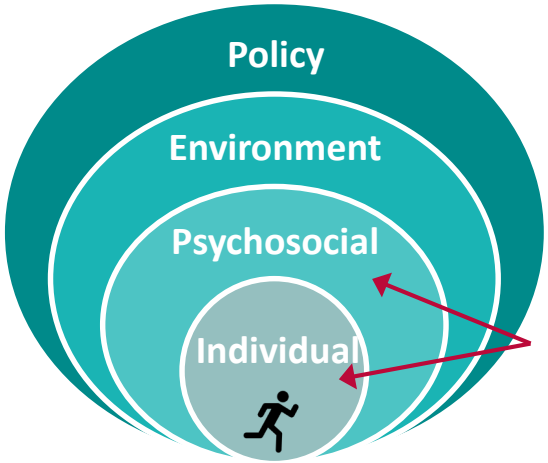


Focus of past research

- Individual: Age, gender, race/ethnicity, SES, etc.
- Psychosocial: social support, self-efficacy, social norms, barriers to exercise, etc.

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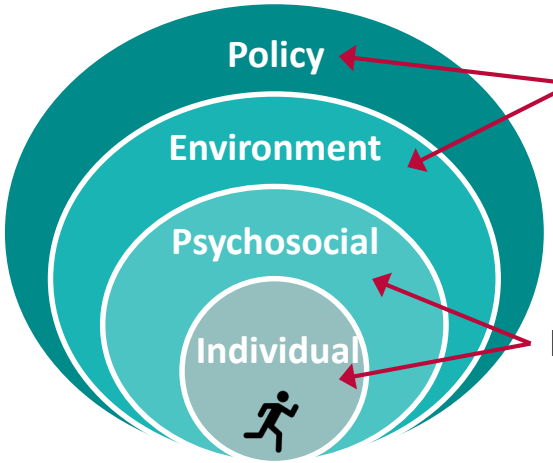


**Less understood**

- Policy: state laws requiring/recommending PE or PA in school, etc.
- Environment: distance to school, home neighborhood environment, etc.

Focus of past research

- Individual: Age, gender, race/ethnicity, SES, etc.
- Psychosocial: social support, self-efficacy, social norms, barriers to exercise, etc.

# How do policy and school environmental factors explain PA among middle and high school adolescents?

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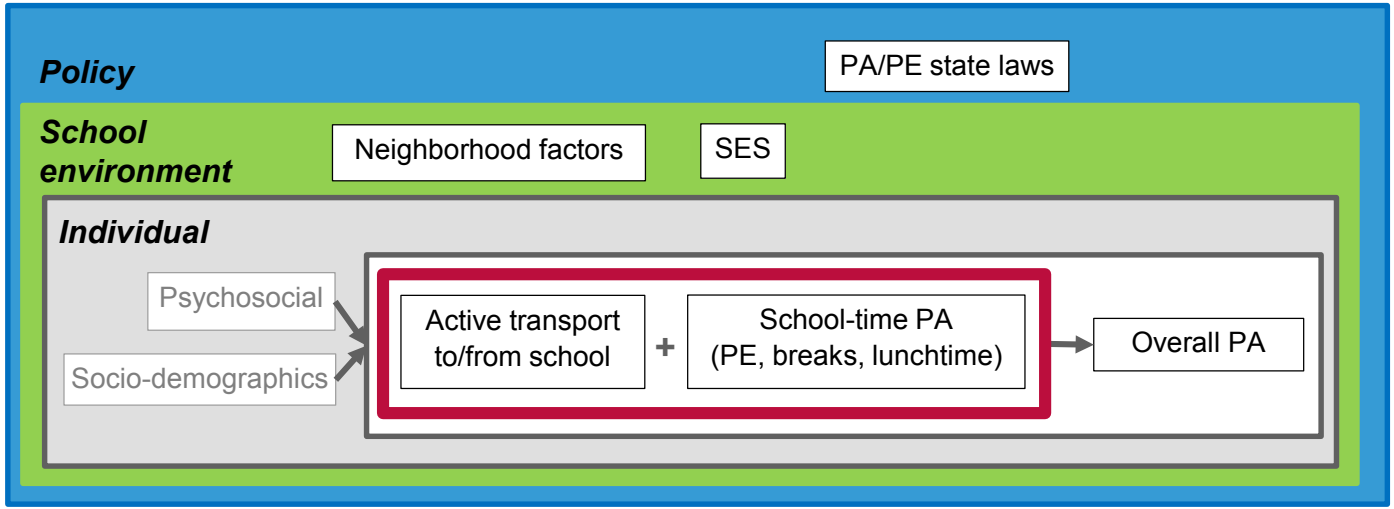
**Aim:** Examine associations of PA/PE state laws and school environmental factors with school-related* and overall PA among middle and high school adolescents separately.




*School-related PA: Active transport to/from school and school-time PA

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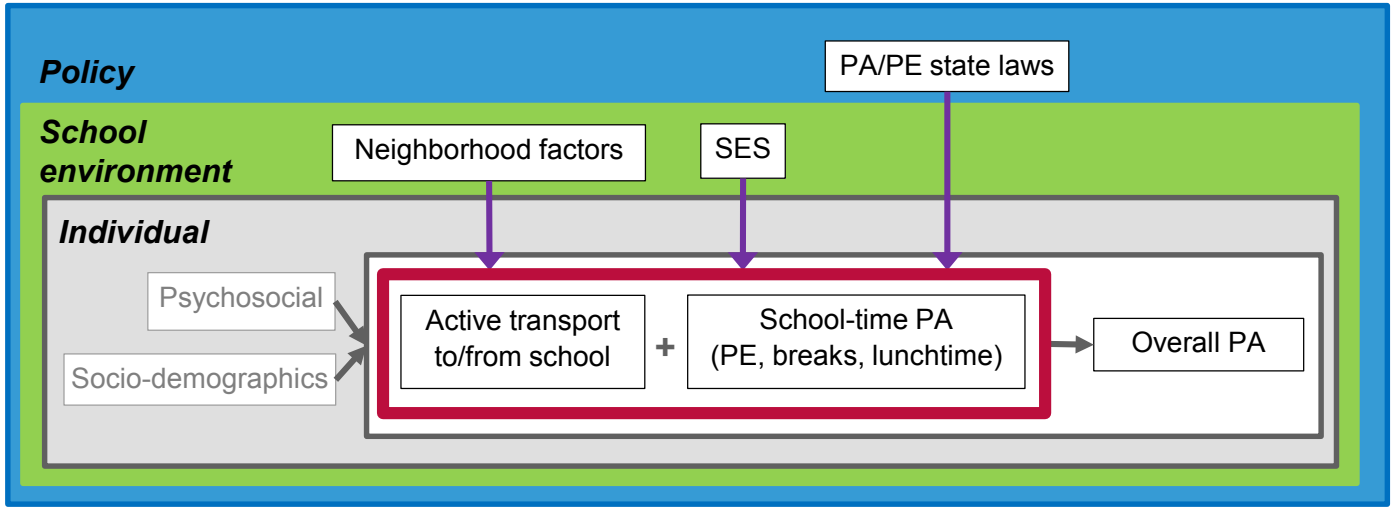


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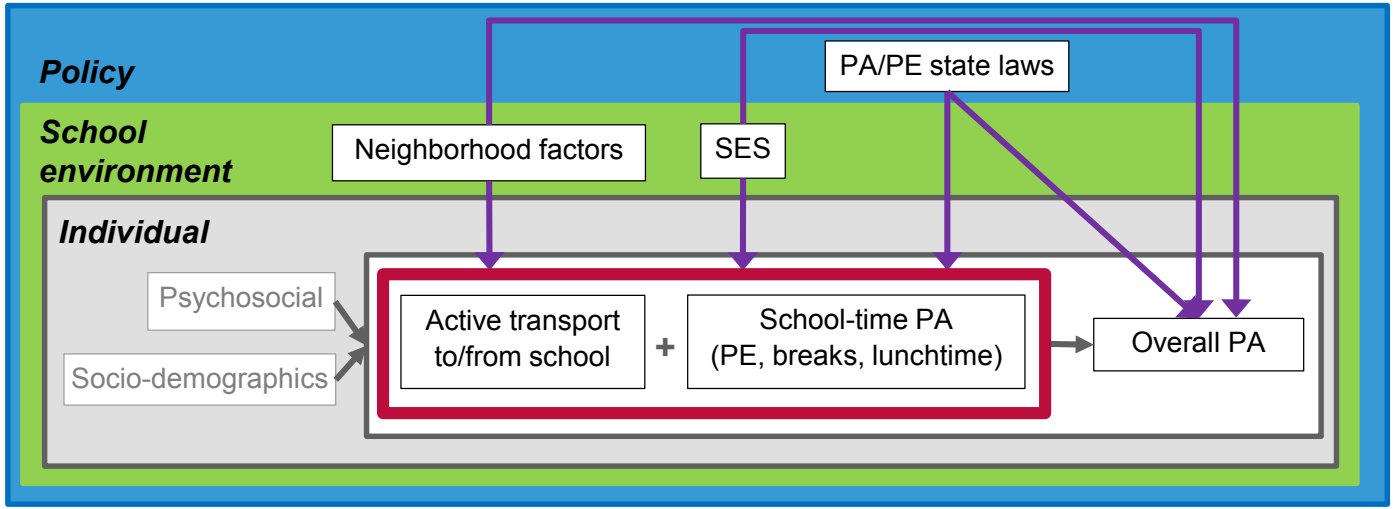



*School-related PA: Active transport to/from school and school-time PA

# Design and Measures

- Source: NCI's Family Life, Activity, Sun, Health, and Eating (FLASHE)
- Non-probability sample of participants from across the US recruited through an online opinion panel.
- Adolescent inclusion:
  - Aged 12-17 years
  - Lived with the participating adult panel member for at least 50% of the time
  - Randomly selected from household roster completed by adult panel member
- Respondents completed online surveys between April and Oct. 2014.
- **Analytical N= 978** public school adolescents (Middle school: 387; High school: 591)

Nebeling et al, AJPM 2017; Oh et al, AJPM 2017

# Physical activity: Youth Activity Profile Questionnaire

| Variable | Description | Scoring |
|---|---|---|
| Self-report | | |
| **Active transport to/from school** | [2 items] # of days walked or biked to/from school in the last 7 days (0= '0' to 4= '4-5 days') | None vs. Any |
| **School-time PA** | [3 items] Freq. of PA during PE, breaks/study hall, and lunch break in the last 7 days (0= 'none' to 5= 'almost all of the time') | Mean |
| Estimated min/week | | |
| **School-related MVPA** | Raw scores on active transport to/from school and school-time PA items converted to min/week | Sum |
| **Total MVPA** | Raw scores on active transport to/from school, school-time PA, non-school time PA, and weekend PA items converted to min/week | Sum |

Saint-Maurice et al, AJPM 2017

# State laws: 2014 PERSPCS

- Respondents received scores for each state law for their state of residence.
- Scoring system (0-5) based on national standards/recommendations.

| Variable | Description | Scoring [a] |
|---|---|---|
| **PE time requirement** | Degree to which state law addresses amount of PE instruction at the middle/high school levels. | Weak vs. Strong |
| **PA time requirement** | Degree to which state law addresses amount of PA occurring in schools, may/may not include time for PE and other activities, at the middle/high school levels. | None vs. Any |

[a] '**Weak**' = scores of 1-2 (non-specific amount of time for PE/PA recommended or state requires <90 min/wk of PE or PA); '**Strong**' = scores of 3-5 (PE or PA required for 90 min/wk or higher); **None**' = scores of 0; ''**Any**' = scores of 1-5.

Physical Education Related School Policy Classification System, https://class.cancer.gov

# Composite Variables Describing School Environments (1200-meter buffers; 2010-14 Census Data)

| Variable | Description | Scoring |
|---|---|---|
| **Density** | Population/residential density. Higher scores represent higher density. | Tertiles (low, medium, high) |
| **Neighborhood age** | Age of buildings/units. Higher scores represent older neighborhoods. | Tertiles |
| **Commute time** | % workers aged 16 or older (excluding those who worked at home) who commuted to work in <20 minutes by any transportation mode. Higher scores represent higher % of residents with short commutes to work. | Tertiles |
| **SES** [b] | Yost SES index. Higher scores represent higher SES. | Tertiles |

[a] Population density; median year structure built; % of units built before 1950; % of units built in 1970 or later; % of commutes <20 minutes; % of commutes ≥35 minutes; % of units that are 1, detached; % of units ≥5 attached; % of units owner occupied; median # of rooms; % of commutes by car, truck or van; % of commutes by public transit; and % of commutes by walking or bicycling.
[b] Based on data on income, poverty, education, employment, occupation, and housing (median house value and median house rent).

Hoehner et al, SSM 2011; Yost et al, CCC 2001; Yu et al, CCC 2014

# *How are policy and school environmental factors associated with PA among middle and high school adolescents?*

Examine associations of school environmental factors and state laws with PA using:

- Logistic regression for self-report **active transport to/from school**
- Linear regression for self-report **school-time PA**, estimated **school-related MVPA**, and estimated **total MVPA**

Ran separate models for middle and high school youth.

Models used survey weights and were adjusted for:

- School urban-rural location (city, suburban, town, rural)
- Socio-demographics:
  - Age, gender, race/ethnicity, parent education, distance between home and school
- Psychosocial factors specific to PA:
  - Social support, social norms, self-efficacy, barriers, attitudes, autonomous motivation, and controlled motivation

# *Distance to school is the dominant factor influencing active transport to school*

**Table B.** Full multivariate models of associations of state laws and school neighborhood factors with self-report active transport to/from school, [a] stratified by school level (FLASHE, 2014).

| | Middle school (n=387) | | | High school (n=591) | |
|---|---|---|---|---|---|
| | OR | 95% CI | | OR | 95% CI |
| **Home to school distance (ref: < 1 mi)** | | | | | |
| **1 to < 2** | **0.09** | 0.04-0.21 | | 0.67 | 0.34-1.30 |
| **2 to < 3** | **0.10** | 0.04-0.25 | | **0.24** | 0.11-0.52 |
| **≥ 3** | **0.06** | 0.03-0.12 | | **0.14** | 0.08-0.28 |

# Significant **positive** associations for state laws only among *high school* respondents

| Variable | High school adolescent PA outcome | | | |
|---|---|---|---|---|
| | Self-report active transport to/from school | **Self-report school-time PA** | **Estimated school-related MVPA min/wk** | Estimated total MVPA min/wk |
| | OR (95% CI) | B (SE) | B (SE) | B (SE) |
| **Strong PE time requirement** (ref: weak) | ns | **0.27 (0.11)** | ns | ns |
| **Any PA time requirement** (ref: none) | ns | **0.34 (0.10)** | **7.53 (2.76)** | ns |

Models adjusted for school environmental factors, school urban-rural location, socio-demographics, and psychosocial factors.

# Significant **inverse** associations for short commute times in school neighborhood only among *high school* respondents

| Variable | High school adolescent PA outcome | | | |
|---|---|---|---|---|
| | **Self-report active transport to/from school** | Self-report school-time PA | **Estimated school-related MVPA min/wk** | Estimated total MVPA min/wk |
| | OR (95% CI) | B (SE) | B (SE) | B (SE) |
| Density | ns | ns | ns | ns |
| Neighborhood age | ns | ns | ns | ns |
| **Commute time:** short commutes (high tertile) vs. long (low tertile) | **0.37 (0.18-0.73)** | ns | **-8.13 (3.91)** | ns |
| SES | ns | ns | ns | ns |

Models adjusted for state laws, school urban-rural location, socio-demographics, and psychosocial factors.

## Strengths

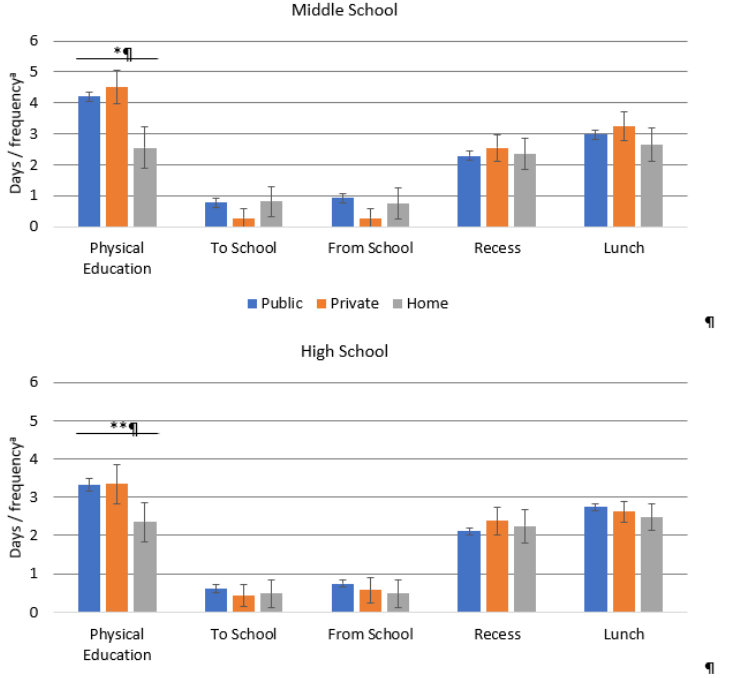
- Range of variables across levels of influence, including policy and school environment levels
- Large sample from across the US, providing greater variability in sample socio-demographics and environmental characteristics than studies from single geographic area

## Limitations

- Cross-sectional.
- Focus on one type of transportation behavior (active transport) when adolescents can use mixed modes of transportation.
- Limited set of neighborhood variables.
- Potential unmeasured confounding by district- or school-level policies and/or practices.

# FLASHE is generating hypotheses about context and youth PA: Physical Activity in Home-Schooled versus other Students

Figure 3. During school hours physical activity means by opportunity, FLASHE 2014




*Post-hoc tests: public vs. home: $P<0.0001$; private vs. home: $P<0.0001$

**Post-hoc tests: public vs. home: $P=0.003$; private vs. home: $P=0.02$

[a]Days of physical activity while traveling to school and from school per week; frequency of physical activity level during physical education class, recess, and lunch

Tribby et al. Submitted, 2019

# Challenges

- **Weights:** Recommend consulting a biostatistician and go with what makes most sense to your research question and analyses.
- **Representativeness:** Adolescent sample was highly active per their estimated PA levels and most parents were highly-educated. Sample may not be representative of general population.
- **Appropriate Geographic Context**: CLASS data is at the state level, but local policies, e.g. at the county level may have stronger influence on adolescent behaviors.
- **Change in Scale of Walkability Measures:** (This study vs Hoehner et al.)
- **Limited set of environmental variables and limitations to access**
- **Limited ability to account for spatial clustering**

# Collaborators

- Dr. David Berrigan, NCI
- Dr. Calvin Tribby, NCI
- Dr. April Oh, NCI
- Dr. Frank Perna, NCI
- Dr. Laura Dwyer, Cape Fox Facilities Services & NCI

- NCI Cancer Prevention Fellowship Program staff and fellows

# Questions?

# FLASHE FAQs

*Linda Nebeling, Ph.D., M.P.H., R.D.*

*April Oh, Ph.D., M.P.H.*

*Laura Dwyer, Ph.D.*

Behavioral Research Program, National Cancer Institute

# Where can I learn about completed FLASHE projects?

- Email nciflashe@nih.gov for a pdf FLASHE publication list or to share information about your FLASHE publications or presentations.
- A current list of FLASHE publications will soon be available online and will be updated quarterly.
  - Slides at the end of this presentation also present a current publication list.
- As of September 2019:
  - 40 FLASHE-related publications
  - Several theses and dissertations using FLASHE
  - Methodology papers
  - Analyses representing adolescent-focused, parent-focused, and dyad-focused outcomes, as well as multiple behaviors (food and beverage consumption, physical activity, sun safety/tanning, electronic device use)

# Are the FLASHE measures validated?

- FLASHE measures were drawn or modified from existing validated measures.
- The FLASHE pre-testing procedures included cognitive and usability testing but not further analysis of measures' validity beyond the existing literature.
- Criteria for FLASHE measures selection included:

| | |
|---|---|
| Relevance to the target group | Items are at appropriate reading level for the target audience |
| Construct validity | Length |
| Relevance to the construct | Items avoid unnecessary overlap |
| Items are comprehensive | Items are logically sequenced |
| Items are clear and unambiguous | Response categories are clearly specified, comprehensive, non-overlapping, and relevant to the items |
| Unbiased language is used | Practical administration |
| Scoring procedures are understandable with minimal training | |

# Can you describe the cognitive and usability testing?

- The FLASHE survey was pre-tested through cognitive and usability testing.

| Cognitive Testing | Usability Testing |
| --- | --- |
| • Goal: Pre-tested items that were not previously tested or used with a teenage population – to identify issues with responding to the items.<br>• Sample: 20 parent-child dyads diverse in race, age, and socioeconomic status<br>• Revisions focused on: wording changes in instructions or questions | • Goal: Pre-tested the Web version of the survey with adolescents – to identify issues with the survey instructions, navigation, and design.<br>•<br>• Sample: 9 adolescents diverse in race, age, parent education, and screen time<br>• Revisions focused on: revising / deleting navigation buttons throughout the survey |

# Why are some raw variables not available in the datasets?

- Some variables in FLASHE are recoded or suppressed from the public use data files due to results from a risk assessment analysis on identifiability.

- Example variables include:
  - *Household income* (dichotomized in dataset as < $100,000 or > $100,000)
  - *Type of parent cancer diagnosis* (collapsed in dataset to: no cancer history, history of one cancer, or history of multiple cancers)
  - *Home and school locations* (suppressed in dataset; used to derive the variables in GeoFLASHE)
  - *Parent age* (recoded in dataset as 18 – 34 / 35 – 44 / 45 – 59 / 60+)

# Do I need to analyze diet, physical activity, or other FLASHE variables (e.g., parenting style) in a specific way?

- FLASHE does not require that variables are analyzed in a specific way. However, some variables have been computed and are available for use.

## Diet

- *Daily frequency variables* – useful for "junk foods" in FLASHE which do not share a common unit of measure
- *Estimated daily intake variables* – consistent with algorithms applied to the 2009-2010 NHANES dietary screener

## Adolescent physical activity

- *Predicted minutes of physical activity that occur at school, out-of-school, and on the weekend; and out-of-school sedentary time*.
  - Data from the Youth Activity Profile (YAP) were calibrated with data from the FLASHE motion study.
- PA values in FLASHE are relatively high, and data users should interpret these values as *estimates* of physical activity (Welk et al. 2017).

# Do I need to analyze diet, physical activity, or other FLASHE variables (e.g., parenting style) in a specific way?

- **Parenting style** items (in the demographic datasets) are drawn from the Parenting Style Inventory-II (Darling & Toyokawa 1997)
  - Assesses responsiveness, demandingness, and autonomy granting
  - Responsiveness/demandingness can be used to create typologies.
    - Note that responses are not normally distributed in FLASHE.

# Appendix

*FLASHE Publications*

# FLASHE Publications (updated September 2019)

**In press and published online ahead of print**

Burns RD. Enjoyment, self-efficacy, and physical activity within parent-adolescent dyads: Application of the actor-partner interdependence model. *Prev Med*. 2019; 126. Online ahead of print.

Mbogori T, Arthur TM. Perception of body weight status is associated with the health and food intake behaviors of adolescents in the United States. *Am J Lifestyle Med*. Online ahead of print.

Welch JD, Ellis EM, Green PA, Ferrer RA. Social support, loneliness, eating, and activity among parent-adolescent dyads. *J Behav Med*. 2019. Online ahead of print.

Zhang Y, Davey C, Larson N, Reicks M. Influence of parenting styles in the context of adolescents' energy balance-related behaviors: Findings from the FLASHE study. *Appetite*. 2019;142. Online ahead of print.

**2019**

Burns RD, Pfledderer CD, Brusseau TA. Active transport, not device use, associates with self-reported school week physical activity in adolescents. *Behav Sci*. 2019;9(3):32.

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# Q & A

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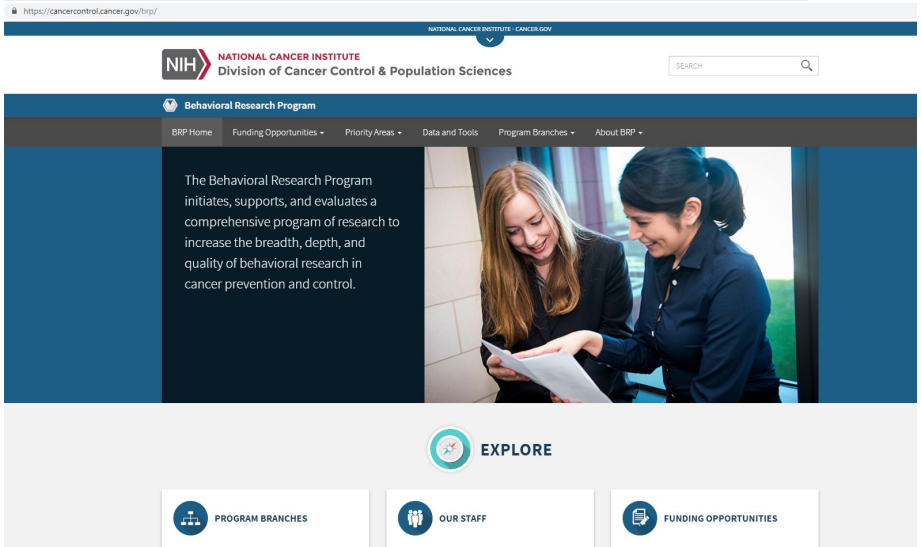


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