

American Society for Nutrition Webinar Series

**National Nutrition Research Roadmap
2016–2021: Advancing Nutrition Research to
Improve and Sustain Health**

Webinar 3: Behavioral Science of Eating Habits



February 1, 2017

A Few Reminders

CPE Credit

- ASN designates this educational activity for a maximum of 1 CPEUs. Dietitians and Dietetic Technicians, Registered should only claim credit commensurate with the extent of their participation in the activity.
- To claim credit, please take the post webinar evaluation to be emailed after the webinar.

**This webinar is being recorded.
Please mute your phone and/or computer microphone.**

Questions & Answers

- Please use the “questions” box on your “Go To Meetings” screen to submit questions to our presenters.
- Please submit your questions at any time during today’s webinar.

Speakers

- **Alice S. Ammerman, DrPH**
Director, Center for Health Promotion and Disease Prevention
Professor, Department of Nutrition
Gillings School of Global Public Health and School of Medicine
University of North Carolina at Chapel Hill
- **S. Sonia Arteaga, PhD**
Program Director, Clinical Applications and Prevention Branch
Division of Cardiovascular Sciences
National Heart, Lung, and Blood Institute
National Institutes of Health

Moderator

- **Marian L. Neuhouser, PhD, RD**
Cancer Prevention Program, Fred Hutchinson Cancer Research Center
President, American Society for Nutrition

Learning Objective

At the end of this program, attendees will be able to:

- Describe research gaps and opportunities, including the open funding opportunity announcements, training activities, and research resources related to the behavioral science of eating habits, as found in the National Nutrition Research Roadmap

Applying behavioral science to better understand eating behaviors

Alice Ammerman DrPH
Professor, Department of Nutrition
Gillings School of Global Public Health
Director, Center for Health Promotion and Disease Prevention
University of North Carolina at Chapel Hill



Disclosures

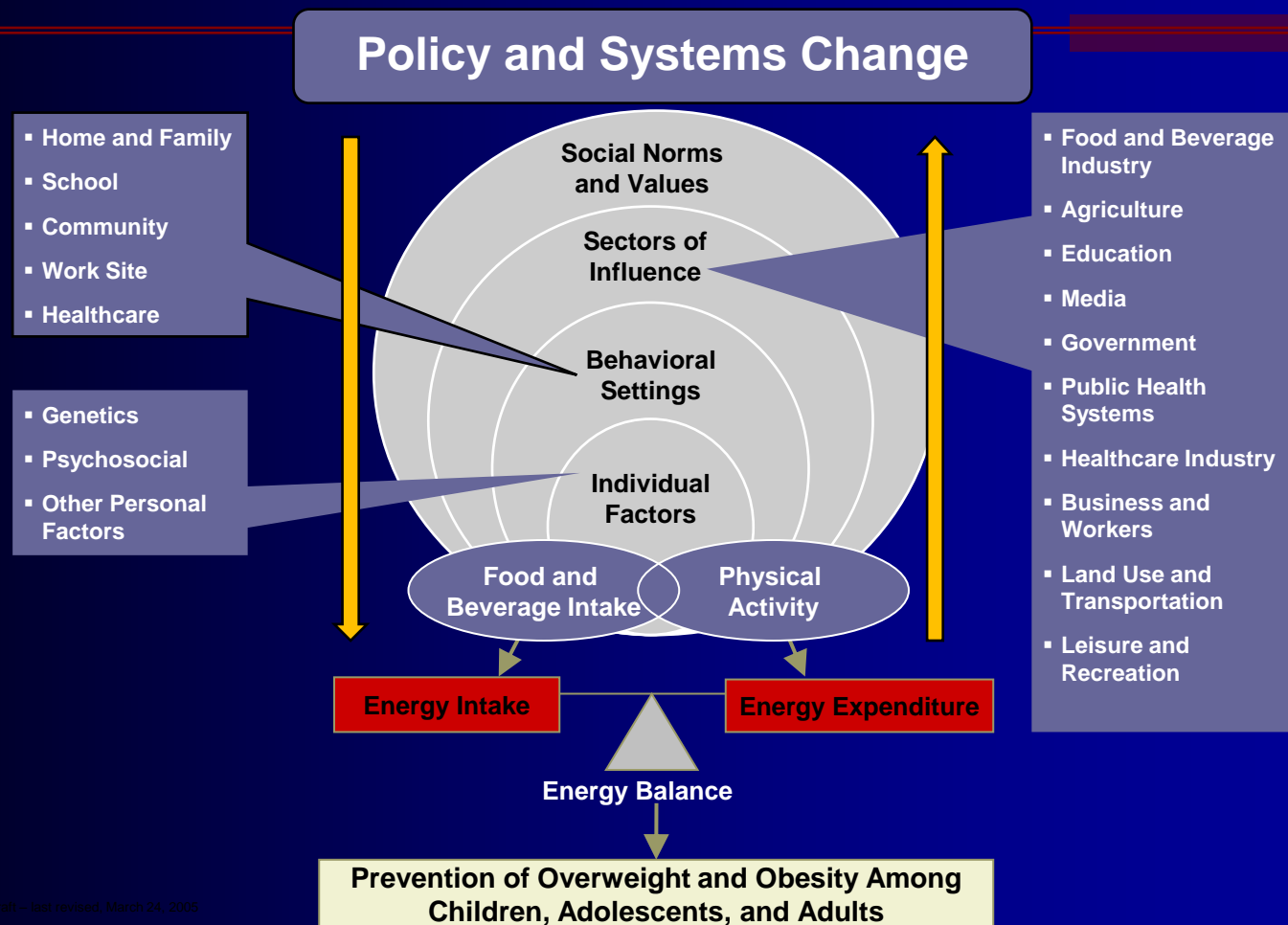
| AFFILIATION/FINANCIAL INTERESTS (prior 12 months) | CORPORATE ORGANIZATION |
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| Grants/Research Support: | None |
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| Stock Shareholder: | None |
| Other | None |

Nutrition Research Roadmap Questions

- Question 2: What can be done to help people choose healthy eating patterns?
- Question 3: How can we develop and engage innovative methods and systems to accelerate discoveries in human nutrition?



CDC Framework for Preventing Obesity

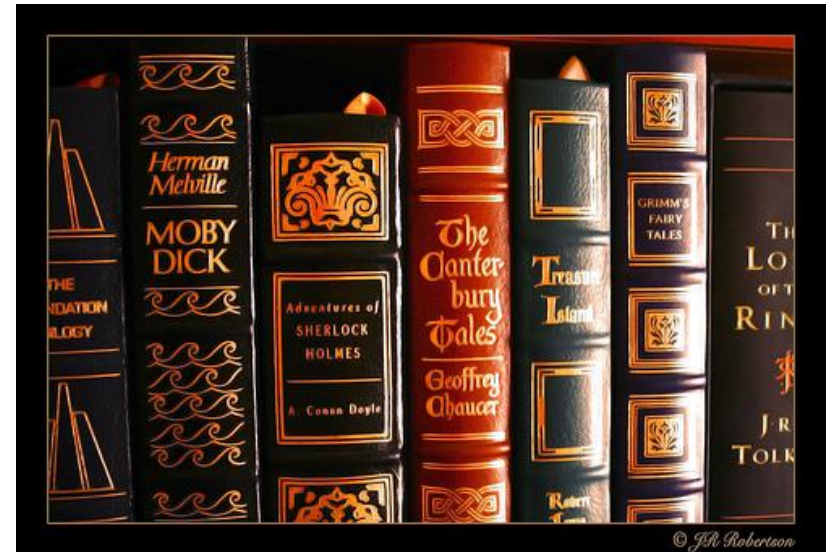


Draft – last revised, March 24, 2005



Behavioral Research Classics

- Applied behavioral theory
 - Health Belief Model
 - Social Cognitive
 - Transtheoretical Model/Stages of Change
 - Theory of planned behavior
 - Many more....
- Study designs
 - Randomized trials
 - Quasi-experimental



Growing areas of research interest/design addressing behavior change



- Research AND Evaluation
- PCORI – Patient Centered Outcomes Research
 - Good fit with community engaged/CBPR
 - Patient Centered Medical Homes
- Pragmatic Clinical Trials
- Comparative Effectiveness Research
- Smart/Adaptive Research Designs
- Precision Medicine/Big Data/mHealth
- Translation, Dissemination and Implementation Research
- Behavioral Economics



IF AN INTERVENTION WORKS

AND NOBODY USES IT...

DOES IT STILL MAKE AN IMPACT?

RESEARCH

Seek to generate
new knowledge

Researcher-focused

Hypotheses

METHODS

Make research
recommendations

Publish results

EVALUATION

Information for
decision making

Stakeholder-focused

Key Questions

ANALYSIS

Recommendations
based on key questions

Publish results and
Report to stakeholders

American Evaluation Association - <http://aea365.org/blog/?p=222>

A Planning and Evaluation Model to “RE-AIM” Health Behavior Interventions

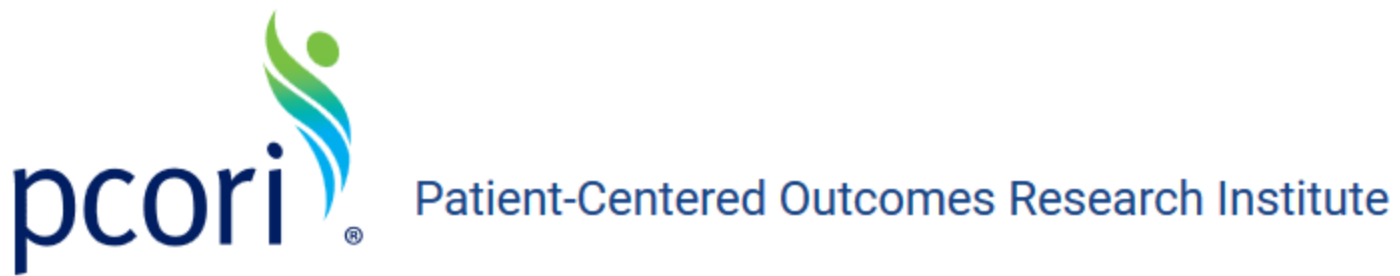


- To broaden the criteria used to evaluate health promotion programs to include external validity
- To evaluate issues relevant to program adoption, implementation, and maintenance
- To help improve the public health impact of behavioral strategies by:
 - **Informing design of interventions**
 - **Providing guides for decision makers**
 - **Providing an evaluative framework to assess potential public health impact**

Impact of Ultimate Health Pill: RE-AIM Perspective



| <u>Dissemination Step</u> | <u>Concept</u> | <u>% Impacted</u> |
|---|----------------|-------------------|
| 50% of Communities Use | Adoption | 50% |
| 50% of Practitioners Prescribe | Adoption | 25% |
| 50% of residents see practitioner | Reach | 12.5% |
| 50% Follow Regimen Correctly | Implementation | 6.2% |
| 50% of Those Taking Correctly Benefit | Effectiveness | 3.2% |
| 50% Continue to Benefit After 6 Months | Maintenance | 1.6% |



An independent nonprofit, nongovernmental organization located in Washington, DC, was authorized by Congress in 2010.

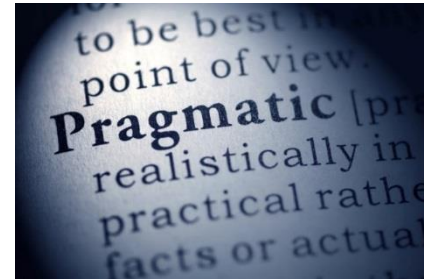
Designed to close the gaps in evidence needed to improve key health outcomes:

- Need to have a clinical anchor but research can link to community/public health
- Requires more than token involvement of patients and service providers
- Proposal process is “unique”
- Doesn’t allow cost assessment



Clinical Data Research Networks (CDRNs)
Patient-Powered Research Networks (PPRNs)

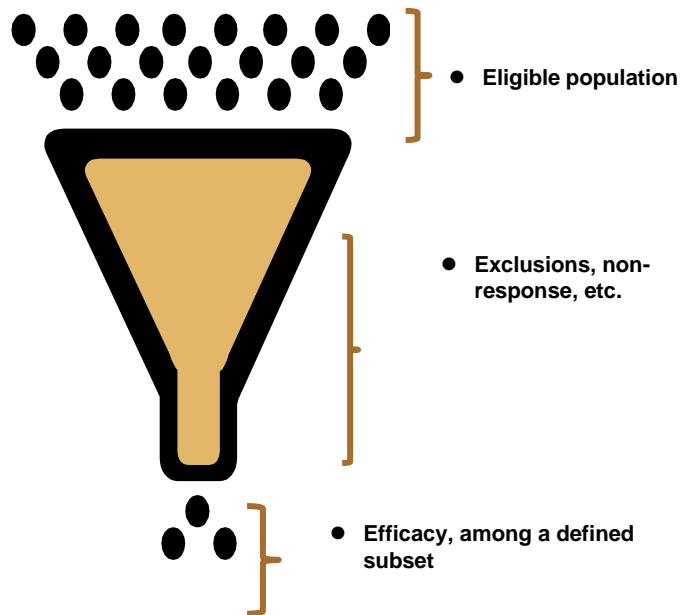
Pragmatic Trials



- A trial “for which the hypothesis and study design are formulated based on information needed to make a decision”
Eg) Is it worth the additional cost to employ Community Health Workers in a CVD Risk Reduction program (in terms of improved patient outcomes)?
- Both RCTs and PCTs capitalize on the rigor of randomization
 - RCTs – internal validity (explanatory/efficacy); strict control over setting, enrolled participants, intervention delivery
 - PCTs – external validity (effectiveness): address practical risks, benefits, costs as they would occur in routine vs. ideal settings
 - More relaxed control over setting/participants/delivery
 - More data collection about implementation, feasibility, cost

To Enhance External Validity, Fewer Exclusions Allow for a Broader Subset of Settings, Staff and Participants

Traditional RCT



PCT

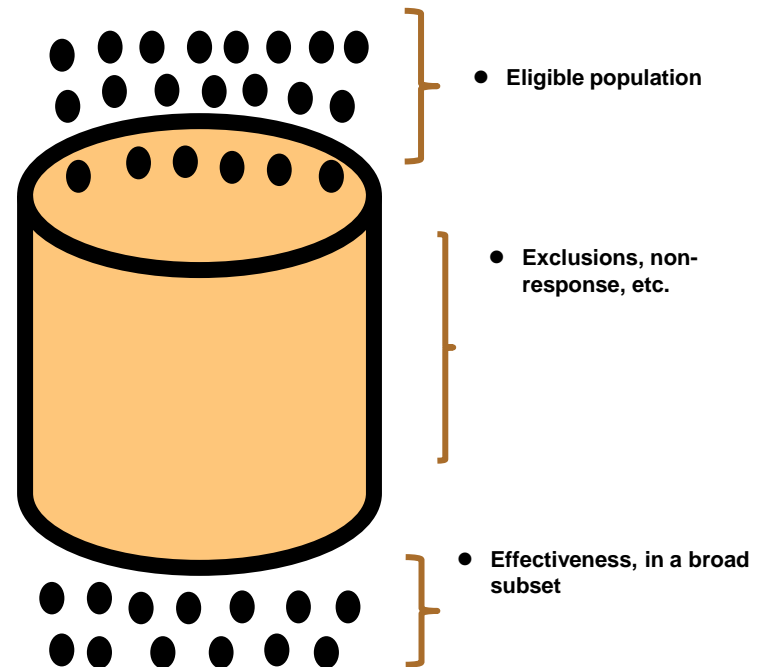
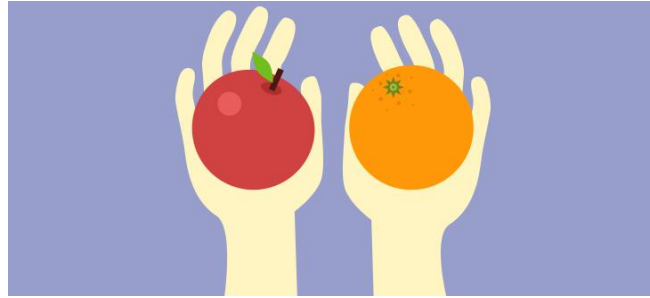


Figure provided by Gloria Coronado, PhD, Kaiser Permanente Center for Health Research

Comparative Effectiveness Research (CER)



Focus on data that helps to decide between alternatives.

PURPOSE: to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels.

Benefits:

- All participants receive some intervention
- Cost estimates are critical
- Helps decision makers and program leaders choose the best option

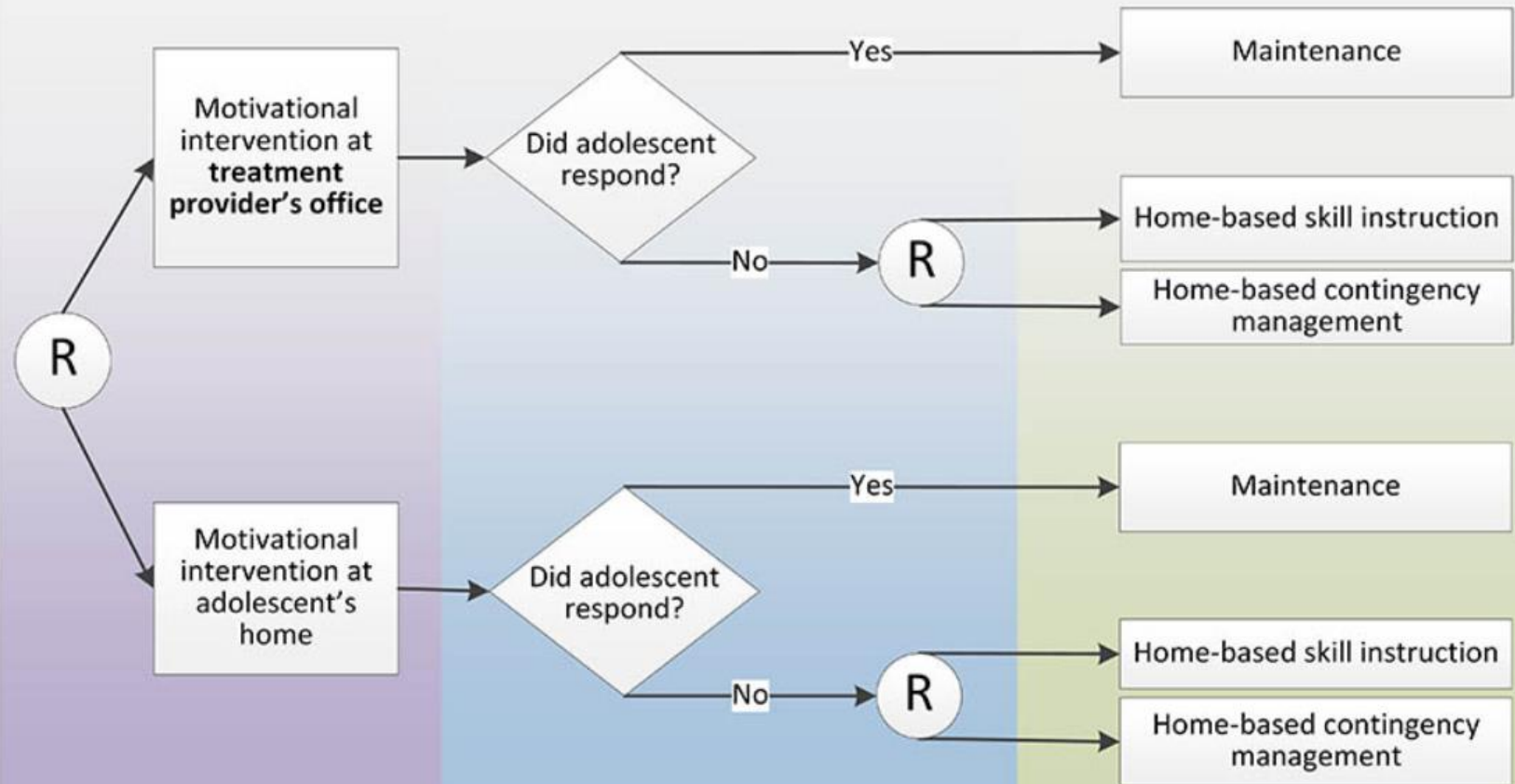


Sequential Multiple Assignment Randomized Trial (SMART)

- Multi-stage trials; same participants throughout
- Each stage corresponds to a critical decision point
- Allows a priori adaptation to anticipate behavioral intervention challenges
- At each stage, subjects randomized to set of behavioral treatment options

Example : Adaptive Treatment for Adolescent Obesity

R = randomization



First, all participants were randomized to receive a motivational weight-loss intervention either in their home or in an office.

After 3 months, participants' weight loss was assessed. Non-responsive participants were re-randomized.

Responsive participants continued on the same treatment. Non-responsive participants were assigned to either home-based skills instruction or home-based contingency management instruction.

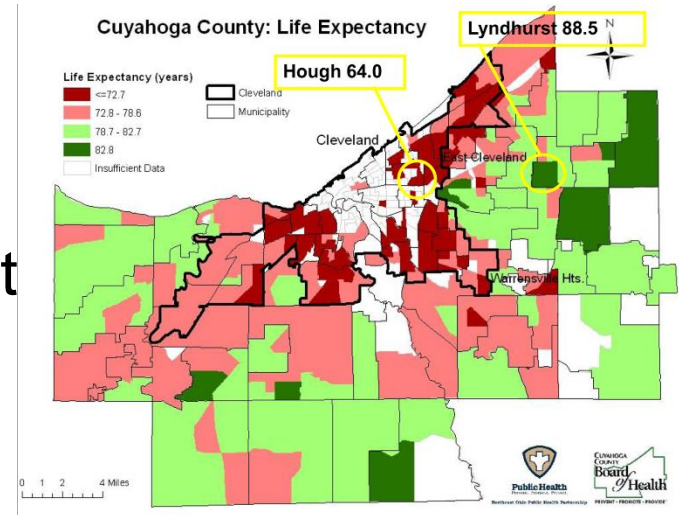
Big Data, mHealth, Precision Medicine

Addressing health disparities

- Genetic code and Zip code
- Understand regional variation to target behavioral interventions

Making use of technology

- Behavioral data collection and monitoring – Fitbits etc.
- Delivery of interventions – web and smart phone based
- Electronic medical records
 - Identify patients at risk
 - Prompt clinical care interventions
 - Link to community resources



Dissemination and Implementation (D&I)

Problem:

- Many effective behavioral interventions have little potential for scaling up/dissemination or sustainability
- Currently there is little focus on ensuring that lessons learned from this research informs and improves patient care or community interventions
 - Research funding wasted?

Solution: NIH PAR-13-055

Dissemination and Implementation Research in Health

Dissemination and Implementation

“D & I Science”

Implementation:

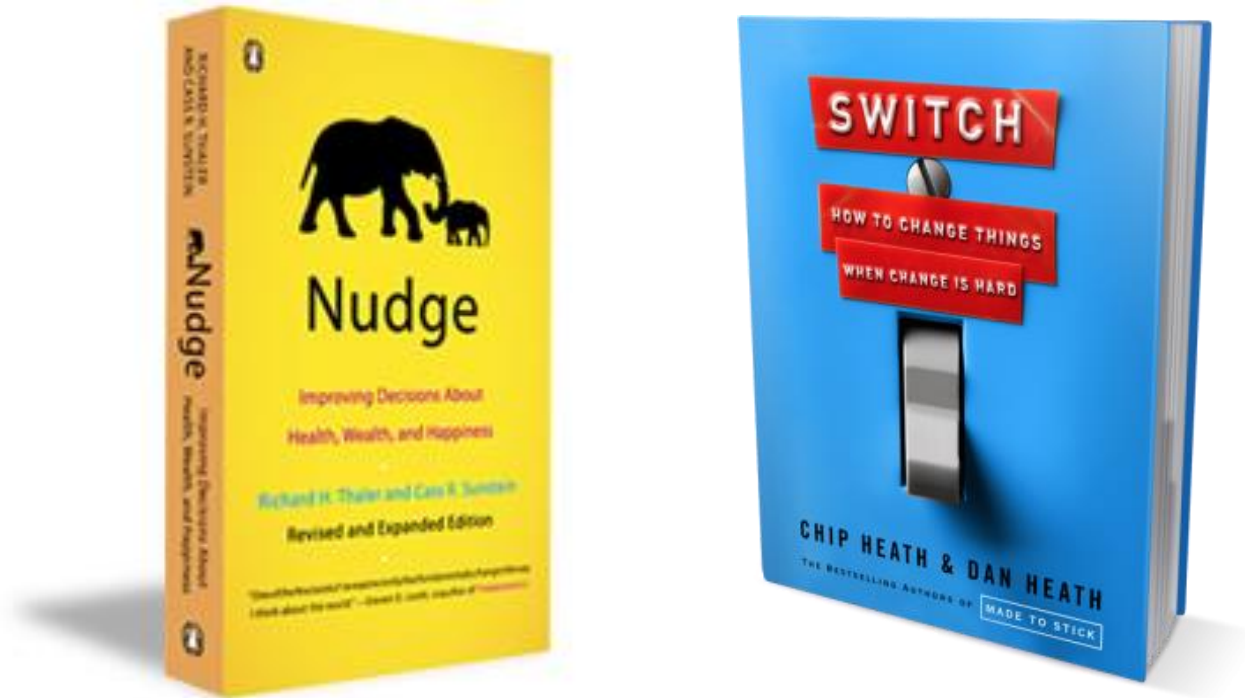
- Execution of an intervention
- Research to practice/reality
- Fidelity considering the real-world context - Adaptation
- “Designing for dissemination”
- Requires a deep understanding of:
 - “Target”/intended population – patients, providers, policy makers
 - Intervention delivery systems and organizations
 - MIN (Minimum Intervention Needed)

Dissemination:

- Works best if you have carefully attended to implementation
- Implies starting with something that is evidence-based
- Scaling up – addresses challenges of expansion and sustainability

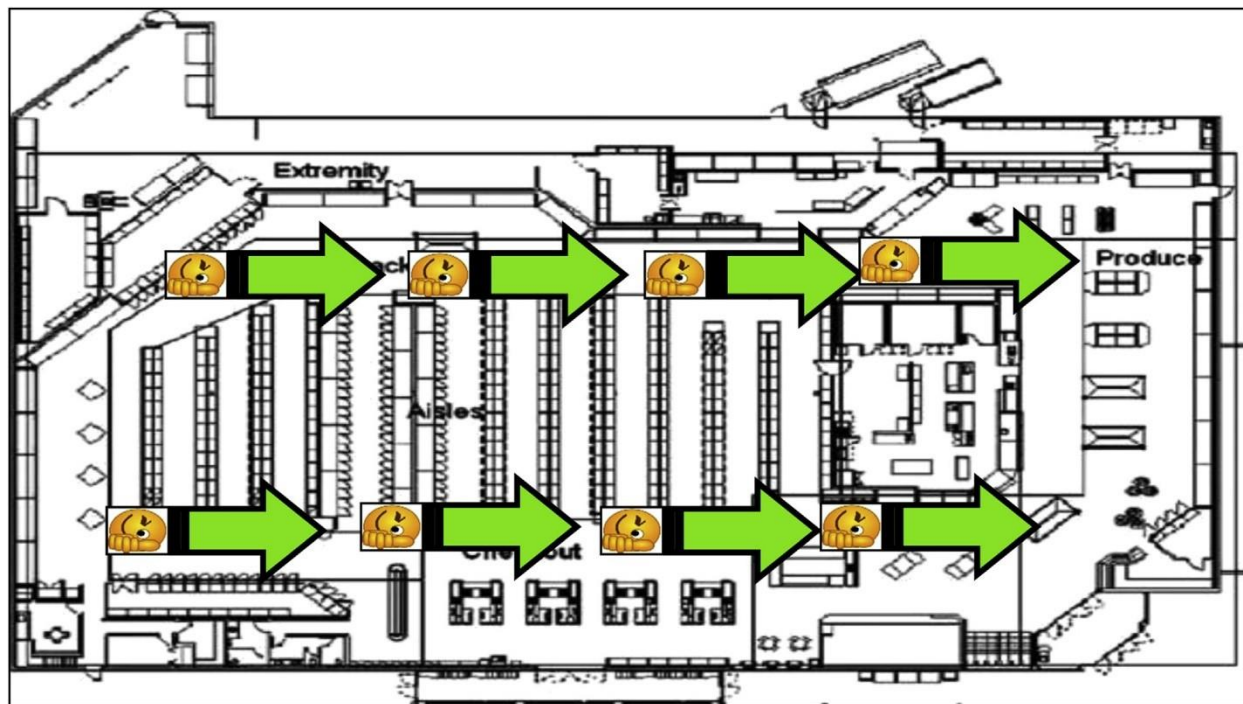


Behavioral Economics



Make the healthy choice the easy choice

“All Signs Point to Health: Arrows on Grocery Floors Increased the Proportion of Produce Spending”



Collin R. Payne, Mihai Niculescu, David R. Just, Michael P. Kelly. **This Way to Produce: Strategic Use of Arrows on Grocery Floors Facilitate Produce Spending Without Increasing Shopper Budgets.** *Journal of Nutrition Education and Behavior*, 2016; 48 (7): 512 DOI: [10.1016/j.jneb.2016.05.001](https://doi.org/10.1016/j.jneb.2016.05.001)



Duke-UNC USDA Center for Behavioral Economics and Healthy Food Choice Research (BECR)

Funded by USDA to promote healthy, economical food choices through the use of behavioral economics with a particular focus on food purchasing choices among SNAP and WIC participants.




Also Funded by USDA



Cornell Center
for Behavioral Economics
in Child Nutrition Programs



Smarter   Lunchrooms
 Movement

Priorities



- Retail Environments
- Reaching SNAP and WIC Participants
- Interventions that can be implemented and tested within current policy
- Translate research findings into actionable tools for change: “News you can use”
- Experiments that could inform future policy

Uses of Behavioral Economics Nudges within Healthy Retail Interventions in the SNAP-Ed Program: Research Opportunities

The Duke-UNC USDA Center for Behavioral Economics and Healthy Food Choice Research (BECR)

Purpose: BECR facilitates new and innovative research on the application of behavioral economics theory to healthy food choice behaviors that would contribute to enhancing the nutrition, food security, and health of American consumers. BECR is particularly interested in promoting healthy and cost-effective food choices for participants in the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Vision: To use behavioral economics principles and strategies to promote healthy, economical food choices among WIC and SNAP recipients and the general public through research, capacity building, and dissemination.

Funding: The BECR Center is funded by grant 59-5000-4-0062 from the U.S. Department of Agriculture.

Disclaimer: The views expressed in this publication are those of the authors and cannot be attributed to the U.S. Department of Agriculture, its Economic Research Service, or its Food and Nutrition Service.

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In 2015, the Supplemental Nutrition Assistance Program (SNAP) provided more than 45 million people with assistance in purchasing foods at a cost of almost \$74 billion.¹ SNAP benefits can be redeemed in SNAP-authorized retailers including supermarkets, supercenters, grocery stores, convenience stores, corner stores, and farmers' markets. However, most SNAP benefits (~90%) are redeemed in supermarkets, grocery stores, or supercenters.² With the exception of hot, prepared foods, SNAP benefits can be used for most grocery items.

The Nutrition Education Program for SNAP recipients (SNAP-Ed) is funded by the USDA at a total of more than

\$400 million nationally and aims to promote healthy, economical food choices.³ In 2010, Congressional legislation expanded the activities allowable under SNAP-Ed to include policy, systems, and environmental change activities. It also required that SNAP-Ed activities be evidence-based. Healthy retail interventions to

Behavior Change and Policy



Evaluating federal nutrition programs:

- ✓ Identify evidence-based strategies
- ✓ Improve delivery approaches
- ✓ Enhance impact
- ✓ Justify funding

SNAP-Ed

- Most significant funding for reaching lower income consumers with behavior and systems-level interventions



SNAP-Ed TOOLKIT

Obesity Prevention Interventions and Evaluation Framework

Two main components:

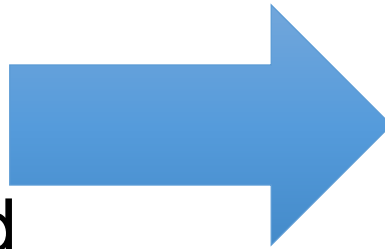
- (1) The **Interventions** component is a package of off-the-shelf evidence-based strategies and interventions that can be readily adopted by State [SNAP-Ed Agencies](#) and providers
- (2) The **Evaluation Framework** is a program evaluation tool that provides a roadmap for monitoring program effectiveness, informing continuous program improvement, and generating a consistent set of program outcomes of interest to stakeholders and funders, including Congress. The SNAP-Ed Evaluation Framework outcomes are to be reported in the SNAP-Ed Annual Report.



Potential “matchmaker” between Researchers and Practitioners

Interventions categorized by level of evidence

- Emerging
- Practice tested
- Research tested



Well tested “on the ground” for feasibility and acceptability but would benefit from more rigorous evaluation to add to the evidence base

Golden opportunity for grant proposals where preliminary data and evidence of feasibility are required

Summary/Recommendations



- Consider nutrition behavior within the broader environmental context
- The “classic” theories and study designs are still relevant but newer approaches can build on these.
- Evaluation studies can make key contributions to behavior research re “what works?”
- PCORI, Pragmatic Trials and Comparative Effectiveness studies are tools to further external validity and translation
- Dissemination and Implementation research helps identify and scale up sustainable interventions.
- SMART study designs allow researchers to anticipate and adapt to anticipated intervention challenges
- Behavioral economics strategies can nudge toward desired behaviors

Environmental context and influence on eating behavior: **The Healthy Communities Study**

S. Sonia Arteaga, PhD

National Heart, Lung, and Blood Institute,
National Institutes of Health

**The National Nutrition Research Roadmap: Behavioral
Science of Eating Habits**

February 1, 2017



Email: arteagass@nhlbi.nih.gov



Disclosures

| AFFILIATION/FINANCIAL INTERESTS (prior 12 months) | CORPORATE ORGANIZATION |
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| Speakers Bureau: | None |
| Stock Shareholder: | None |
| Other | None |

Nutrition Research Roadmap Questions

- Question 2 Topic 1: “How can we more effectively characterize the interactions among the demographic, behavioral, lifestyle, social, cultural, economic, occupational, and environmental factors that influence eating choices?”
- Question 2 Topic 2: “How can we develop, enhance, and evaluate interventions at multiple levels to improve and sustain healthy eating patterns?”

Overview

- Healthy Communities Study: Nutrition
- NIH Funding opportunities

Healthy Communities Study

<https://www.nhlbi.nih.gov/research/resources/hcs/>

Study Partners

- **Coordinating Center:**
 - Battelle – Lisa John, PhD, Warren Strauss M.S.
- **Community Measures:**
 - University of Kansas – Steve Fawcett, PhD
- **Nutrition:**
 - **University of California, Ag & Natural Resources,
Lorrene Ritchie PhD**
- **Physical Activity:**
 - University of South Carolina, Russ Pate PhD
- **NIH:** NHLBI, NIDDK, NICHD, NCI, OBSSR
- **Scientific partners:** CDC and RWJF
Funded by NHLBI, NIDDK, NICHD, NCI, OBSSR
Contract No. HHSN268201000041C

Rationale and Aims

Rationale

- Childhood obesity is a public-health problem.
- Many local programs and policies address childhood obesity, but they have not been systematically assessed in a common way.
- There is natural variation in many aspects of these programs and policies, including
 - intensity level, duration, funding, target population, and how they are implemented.

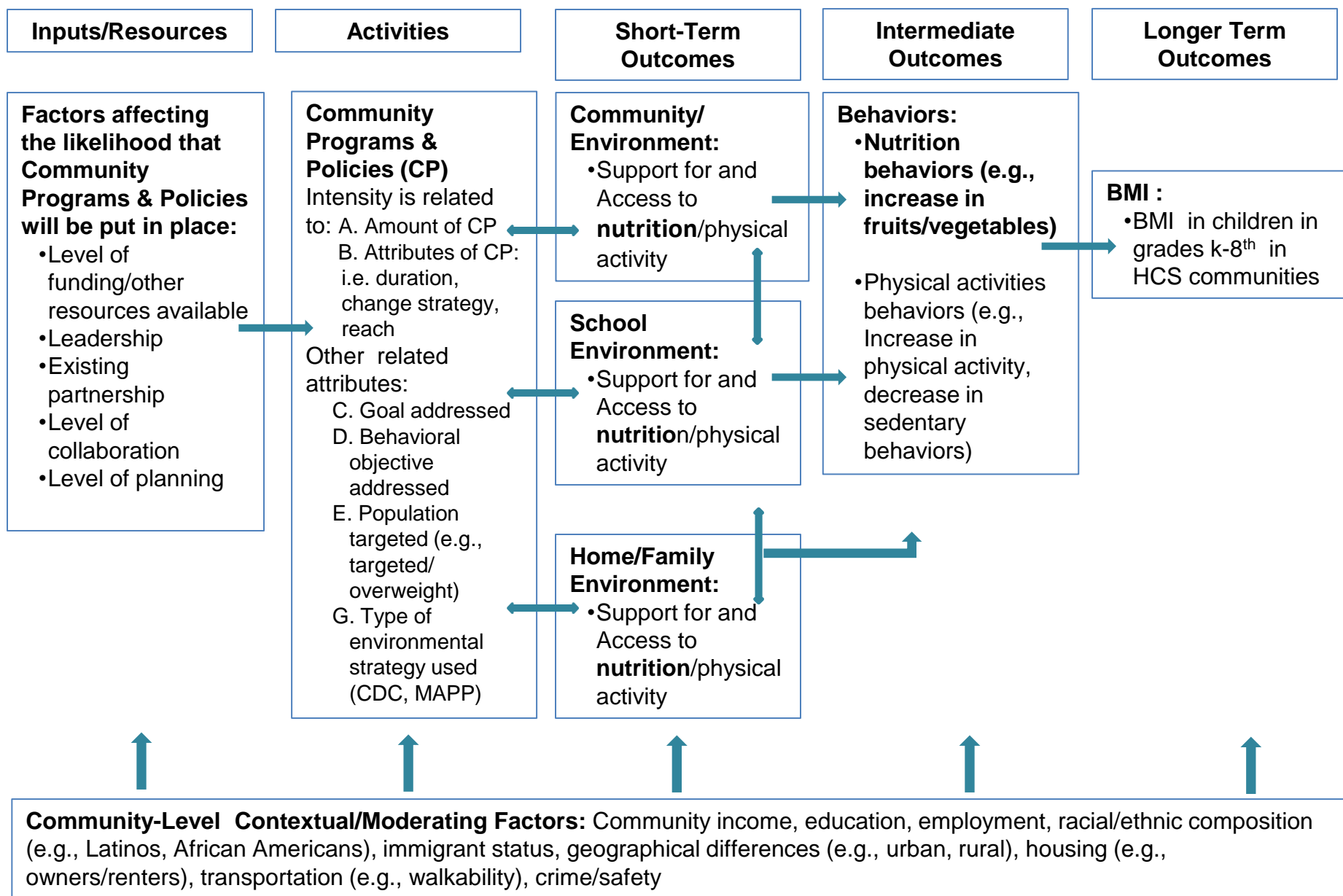
HCS Study Aims

To assess/identify:

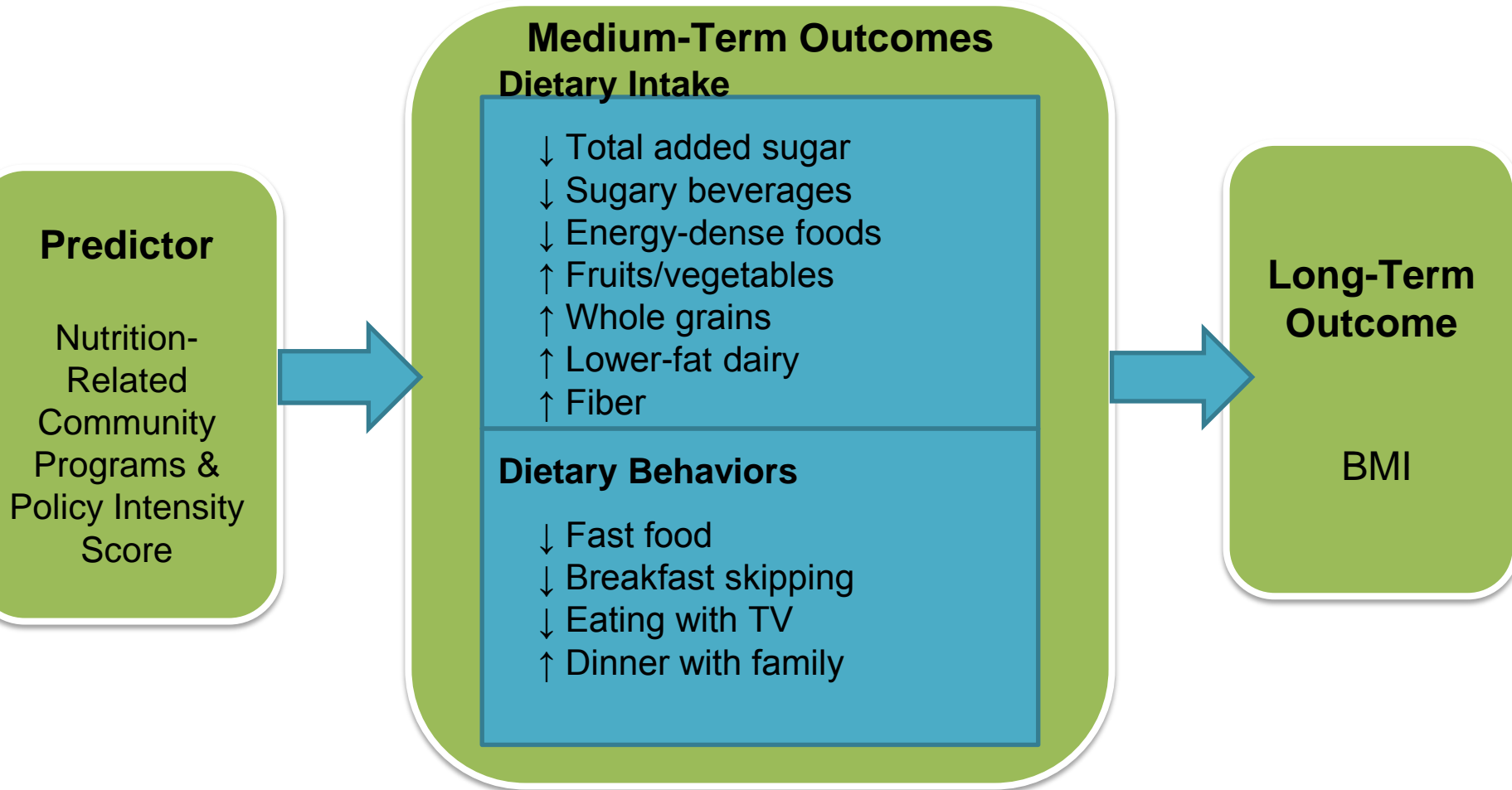
- Associations between characteristics of community programs/policies (CPPs) and BMI, diet, and physical activity for children
- Community, family, and child factors that modify or mediate such associations
- Associations between characteristics of CPPs and BMI, diet, and physical activity in communities with
 - a high proportion of African American, Latino, and/or
 - low-income residents.

HEALTHY COMMUNITIES STUDY: HOW COMMUNITIES SHAPE CHILDREN'S HEALTH (NIH)

LOGIC MODEL



Dietary Outcomes



Study Design

Study Design

Design: Observational study (2010-2016)

Community – public high school catchment area

- ***Cross-sectional*** (2013-2015)- BMI, diet, physical activity, program/policy , school assessments
- ***Retrospective*** (2003-2015) - previous 10 years of data on
 - Children (medical record abstraction) AND
 - Communities (program/policy review)



Study Design Continued

Multi-level

- Communities
 - 10-14 key informants interviewed
- Schools
 - up to 2 elementary and 2 middle schools
- Children (K-8th grade)
 - up to 81 children and their families



Community Selection (N=130)

National Probability Based Sample (N=102)

- Region: Northeast, Midwest, West, South
- Urbanicity: Urban, Suburban, Rural
- Race/Ethnicity: 30% African American, 30% Latino, 30% other
- Income: Low Income or Non low-income
- Pre-Selection Activity rating of Community-Based Programs Policies (High, Moderate, and Low/None)

“Known” Communities (N=28)

- included because of prior knowledge of promising programs and policies



HCS Household Data Collection

Standard Protocol

- BMI/anthropometry
- **Nutrition questions**
- Physical activity questions
- Medical history
- Demographics
- Behaviors/attitudes
- Exposure to community programs/policies
- Request consent to obtain child's medical record
- Modified Windshield Survey of the home

Enhanced Protocol

Standard Protocol *plus*

- **24-hour dietary recall at first home visit and repeated at second home visit 1 week later**
- Physical activity recall questions
- Accelerometers used over the 1-week period between the first and second home visits



HCS: Community and School Data collection

Community and Environmental Assessments

- 10-14 key informants in each community
- Document review of schools/community programs/policies
- Assess history of programs/policies collected for previous 10 years

School Assessments

- Observations in 4 schools (2 Elementary and 2 Middle)
 - Lunchroom Observations
 - Interview of physical education instructor
 - Physical Activity Resource Assessment (PARA) administered at school
- Web-based surveys
 - The District Food Service Administrator/ Manager will complete food environment for each of the recruited schools that fall within their school district
 - School staff will complete a survey on the school policies and practices related to physical activity and nutrition



Nutrition



Interviewer-
Administered
Survey



Dietary
Screeners
Questionnaire



Automated
Self-
Administered
24-hour Recall



Community Programs/Policies

Intensity score

Intensity Score

- **Behavioral intervention strategy used, e.g.,**
 - Higher—Modifying access or policy change;
 - Lower—Providing information
- **Duration e.g.,**
 - Higher—Ongoing;
 - Lower—one time
- **Reach e.g.,**
 - Higher—21% or more of children in area;
 - Lower—1-5%

Standardized to 0-1 for ease of interpretation

Nutrition Manuscript in progress

Purpose: Examine associations between:

- intensity of community programs and policies aimed at improving child nutrition
- child dietary behaviors

Nutrition Future Directions

- Adjust intakes for enhanced protocol measures
- Further examine CPPs according to behavioral objectives and other characteristics
- Examine school level data collected in addition to information on CPPs collected from key informant interviews (e.g., observations of school nutrition and surveys from school foodservice directors and school staff)
- Examine associations by demographic factors such as race, ethnicity and family income, etc.

HCS Next Steps:

- 20+ manuscripts in preparation or submitted
 - Topics include: CPPs and Nutrition, Physical activity, Prevalence of CPPs, Recruitment outcomes, challenges, lessons learned, Statistical methods for designed and undesigned missingness, CPPs related to active transport and physical activity, Neighborhood quality and PA
- Investigator grants
 - K01 grantee: Lauren Au K01HL131630- “Disparities in the relationship between the school nutrition environment and childhood obesity.”
- Limited access dataset:
 - available in Biolincc June 18, 2018

Summary

1. HCS is an example of study that addresses interactions at multiple levels and how those interactions are related to eating behaviors.
2. HCS also is an example of a study developed new approaches to assess the relationship between interactions at different levels and eating behaviors.

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Office of Behavior and Social Sciences Research

- Deborah Young-Hyman*, Ph.D.
- *Wendy Nilsen, PhD*

*Members of the Executive Committee

NIH relevant funding announcements

- [Ancillary Studies to Identify Behavioral and/or Psychological Phenotypes Contributing to Obesity \(R01\)](#)
- [Behavioral Interventions to Address Multiple Chronic Health Conditions in Primary Care \(R01\)](#)
- [Behavioral and Social Science Research on Understanding and Reducing Health Disparities \(R01\) and \(R21\)](#)
- [Diet and Physical Activity Assessment Methodology \(R01\) and \(R21\)](#)
- [Revision Applications for Validation of Mobile/Wireless Health Tools for Measurement and Intervention \(R01\)](#)
- [Healthy Habits: Timing for Developing Sustainable Healthy Behaviors in Children and Adolescents \(R21\) and \(R01\)](#) – Expires May 2017
- [Health Promotion Among Racial and Ethnic Minority Males \(R01\) and \(R21\)](#)
- Education and Health: New Frontiers ([R01](#)) ([R03](#)), ([R21](#))
- [Metabolic Contributions to the Neurocognitive Complications of Diabetes: Ancillary Studies \(R01\)](#)
- [Research on the Mechanisms and/or Behavioral Outcomes of Multisensory Processing \(R01\)](#)
- [The BRAIN Initiative Active Funding Opportunities](#)
- [Understanding Factors in Infancy and Early Childhood \(Birth to 24 months\) That Influence Obesity Development \(R01\)](#)

Funding/Training links

- OBSSR listserv - <https://obssr.od.nih.gov/funding/listserv-for-behavioral-and-social-research-funding-announcements/>
- NCCOR - <http://www.nccor.org/>
- Institute of Randomized Clinical Trials - <https://obssr.od.nih.gov/training/training-institutes/institute-on-randomized-clinical-trials/>
Deadline Feb 24, 2017!
- PRIDE - <http://www.biostat.wustl.edu/pridecc/>
Deadline March 1, 2017!

Questions & Answers

**Please submit your questions via the
“questions box” on your screen.**

You may also reach out to our speakers:

**Alice S. Ammerman, DrPH
alice_ammerman@unc.edu**

**S. Sonia Arteaga, PhD
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