

Built Environments, Obesity and Health

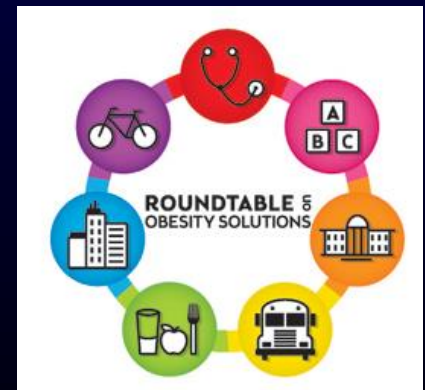
Food and Nutrition

Environments



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What are food environments
& why do we care about them

What do we know – associations

What do we know – strategies for change

Retail food environments: food stores, restaurants

School food environments

Multicomponent community-wide programs

Research gaps, challenges and opportunities

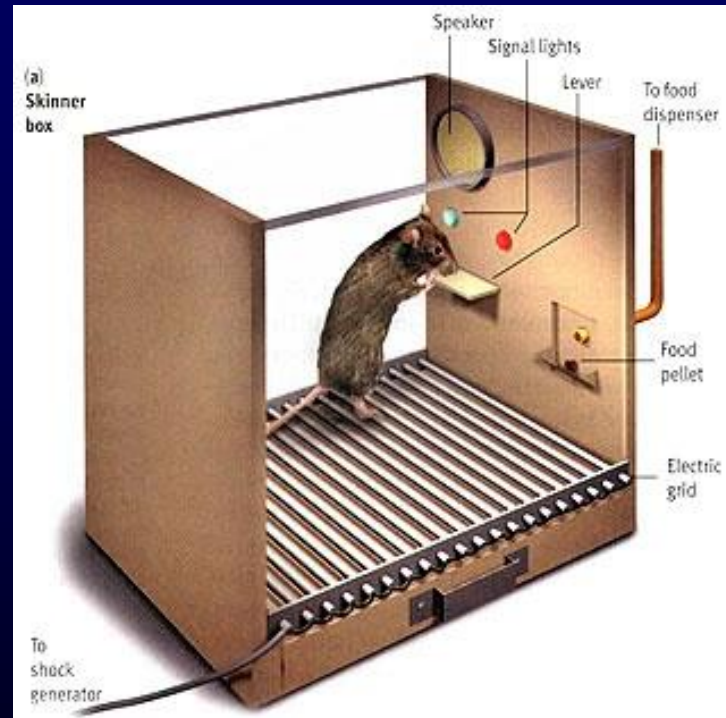
The road forward



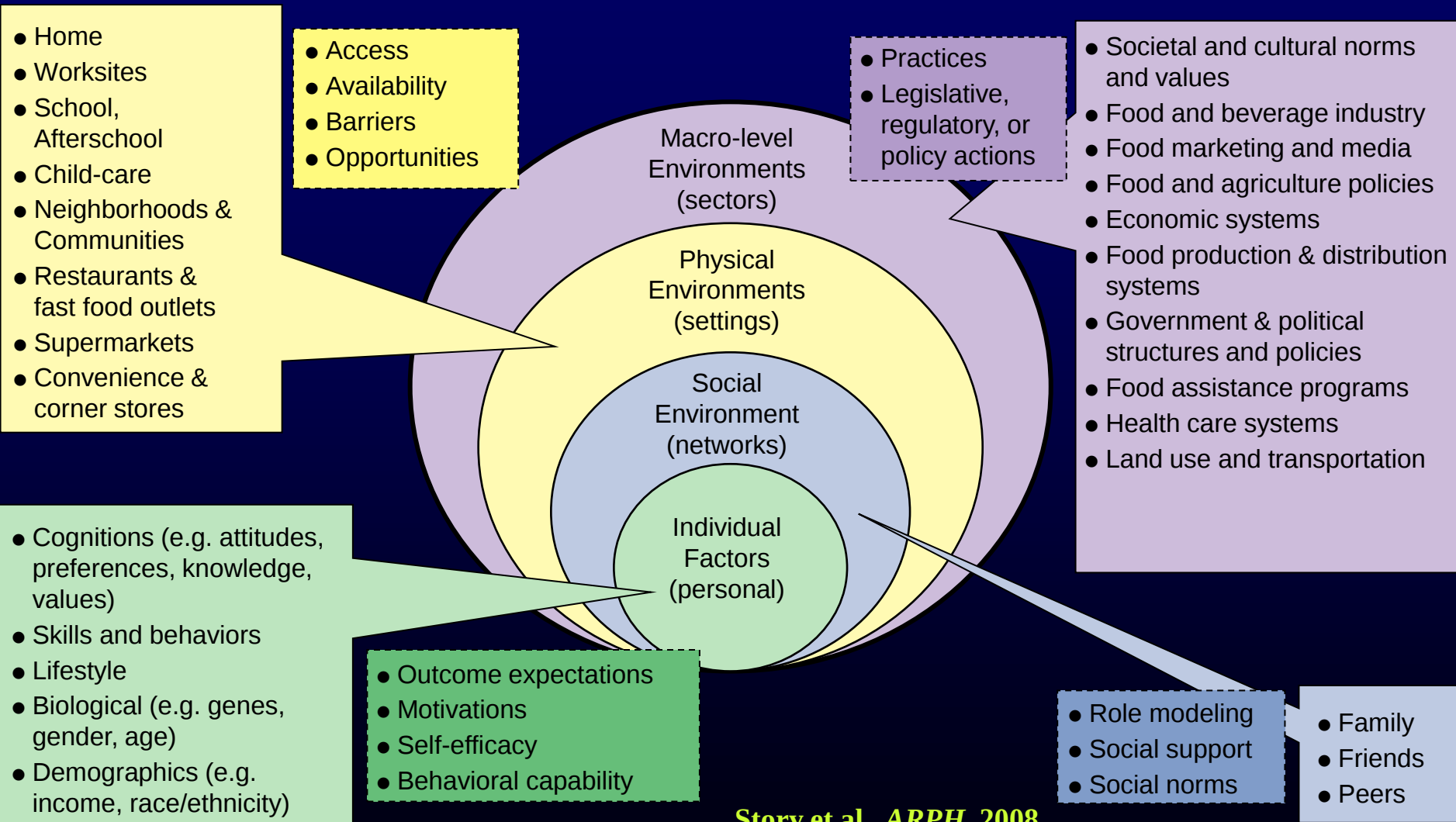
The Model: Environment → Behavior



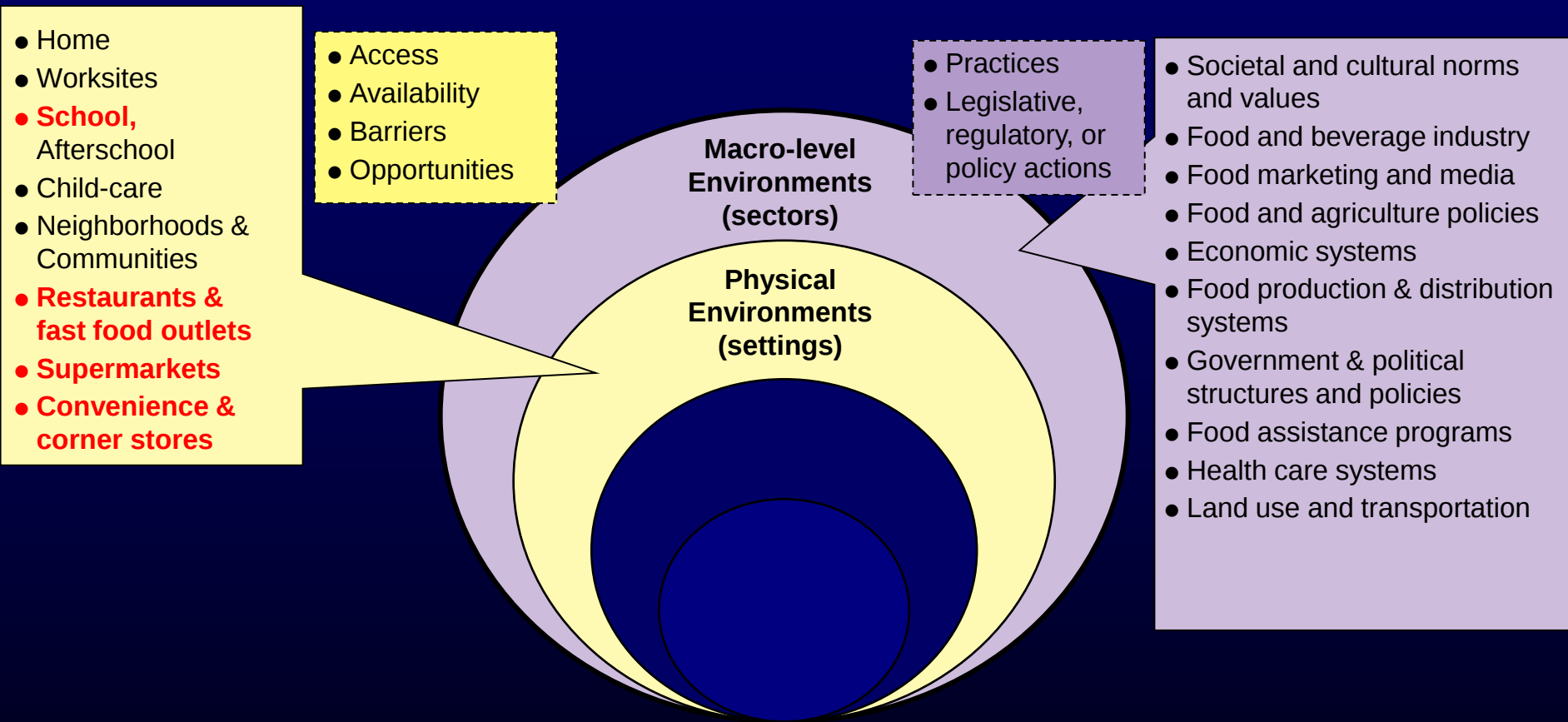
B.F. Skinner
1904-1990



An Ecological Framework Depicting the Multiple Influences on What People Eat



Story et al., ARPH, 2008



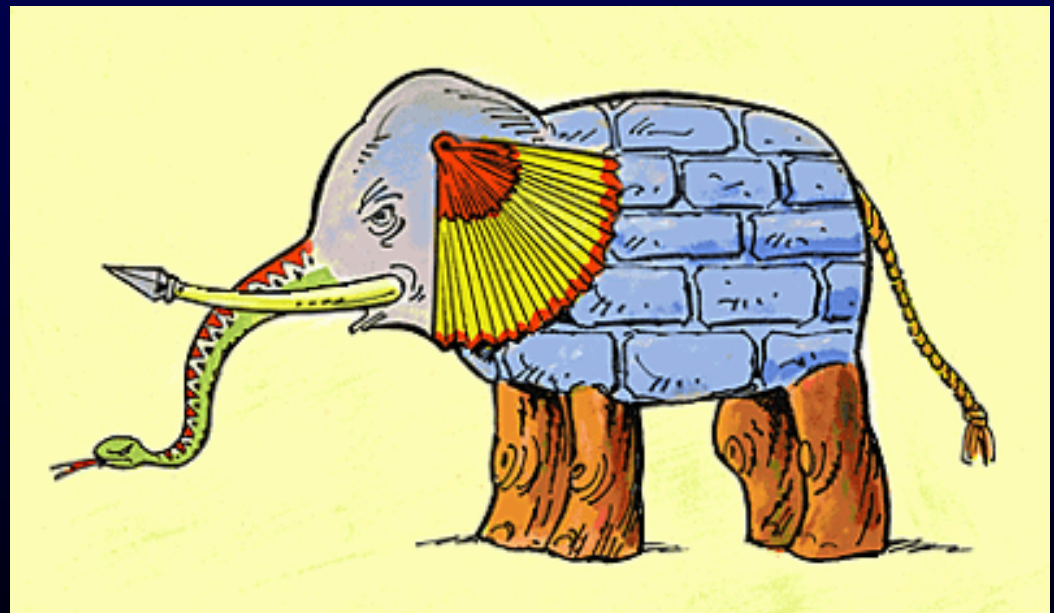


The Parable of the Blind Men And the Elephant

*A wall? A fan? A snake? A spear?
A rope? A tree trunk?*

There are many perspectives, and each may be only part of the picture

Subjective experience can be true, but may not account for the full truth



What is the “built environment”?

- ❖ Products of human building activity
- ❖ Part of cultural evolution and construction
- ❖ Characteristics of civilizations
- ❖ Physical, social, cultural constructs

Related to food:

- ❖ Which foods are where in stores and restaurants
- ❖ Policies within organizations (e.g., school food service policies)
- ❖ Economic drivers (e.g., soda taxes)



Food Environments & Policies: How do they go together?

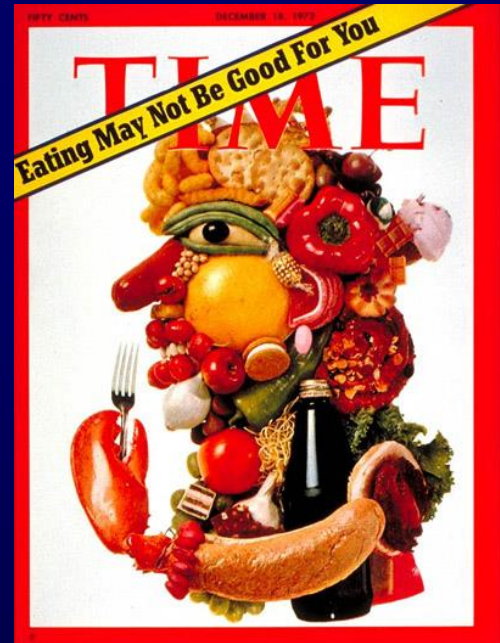
Policies can shape environments →
school food policies, catering policies,
price supports, food assistance policies

BUT

**Environments often evolve in the absence of
specific policies**

AND

Policies can be health-promoting or not



Nutrition/Food vs PA Environments

Food is a commodity

Food products are big business

Food is highly regulated

(safety, taxation, hygiene)

Complex (nutrients, foods)

**Organizational environments
play a large role**



The Working Hypothesis (Vastly Simplified)

Influences

Environments
Policies

Genes
Biology
Psychology

Behaviors

Energy Balance
Diet
Physical Activity
Sedentary

Health Outcomes

Obesity
Diabetes
Heart
Disease

Sickness
Death
Costs



A Closer Look at the Food Environment Hypothesis (simplified)



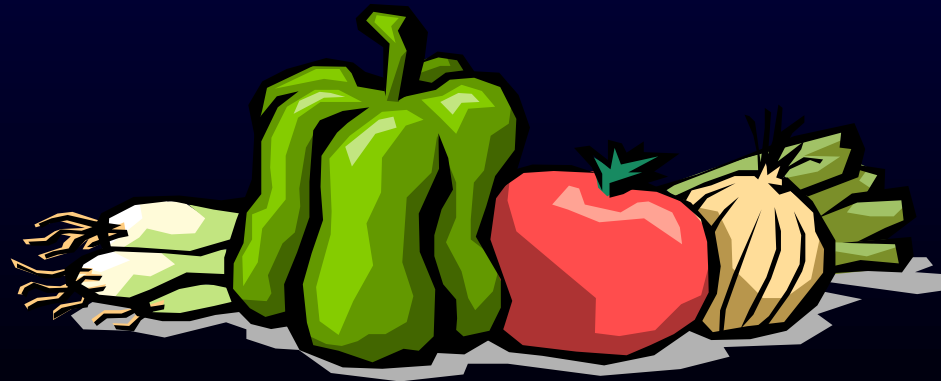


What we know from available research (descriptive and associations)

- ❖ Environment-BMI associations
- ❖ Environment-diet quality associations and disparities

EARLY FINDINGS (retail food environment):

- Supermarkets → healthier
- Fast food restaurants →
obesogenic



Obesity in NYC Neighborhoods (2003 & 2007)

PERCENTAGE OF RESIDENTS WHO ARE OBESE

0 8 16 24 32

MANHATTAN

Upper East Side; Gramercy Park-Murray Hill



Upper West Side



Chelsea-Clinton; Greenwich Village-Soho



Union Square-Lower East Side



Lower Manhattan



Washington Hts-Inwood



Central Harlem-Morningside Hts



East Harlem



BROOKLYN

Bensonhurst-Bay Ridge



Borough Park



Coney Island-Sheepshead Bay



Downtown-Brooklyn Hts-Park Slope



Greenpoint



Sunset Park



East Flatbush-Flatbush; Canarsie-Flatlands



Williamsburg-Bushwick



Bedford-Stuyvesant-Crown Hts



East New York



QUEENS

Flushing-Clearview



Ridgewood-Forest Hills



Long Island City-Astoria; West Queens



Bayside-Little Neck; Fresh Meadows



2007

Percent Obese

< 10.0

10.1 - 15.0

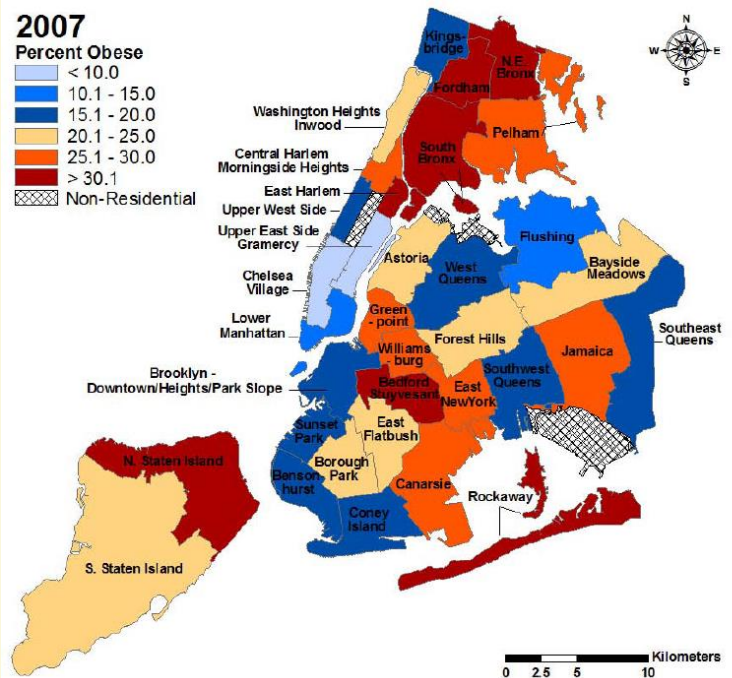
15.1 - 20.0

20.1 - 25.0

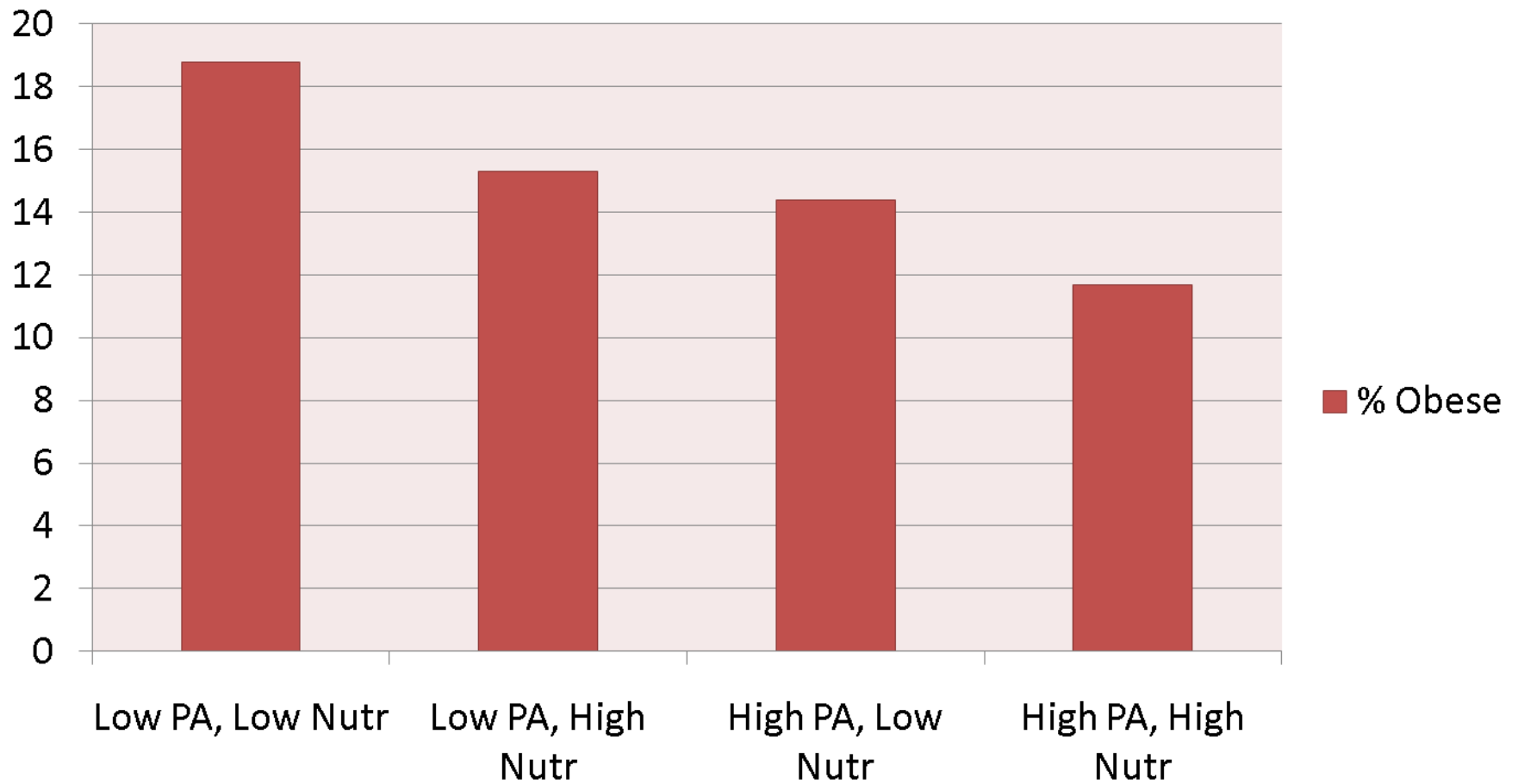
25.1 - 30.0

> 30.1

Non-Residential



% Obese by Neighborhood Type - Children



	Low PA, Low N	Low PA, High N	High PA, Low N	High PA, High N
BMI in 85 th percentile	34.4%	31.6%	28.7%	27.3%
BMI in 95 th percentile	18.8%	15.3%	14.4%	11.7%

Nutrition Environments & Disparities

More fast-food restaurants in
minority neighborhoods

Some healthy foods less available
&/or poorer quality in minority &
low income areas

Supermarkets less accessible in
poor and Black areas



Review: Beaulac et al. *PCD* 2009

Local Food Environments and Obesity

Systematic Review 2015 (Cobb et al., *Obesity*)

71 studies representing 65 cohorts

Most-Studied Exposures

- Supermarket availability
- Fast food restaurant availability



Main Findings

- **Associations between outlets & obesity mostly null**
- Supermarket availability more often associated with adult obesity or null findings
- Small stores associated w/ child obesity (in 50% of studies)
- Fast food availability associated w/ child obesity, but many studies were null
- **Overall low quality of studies**

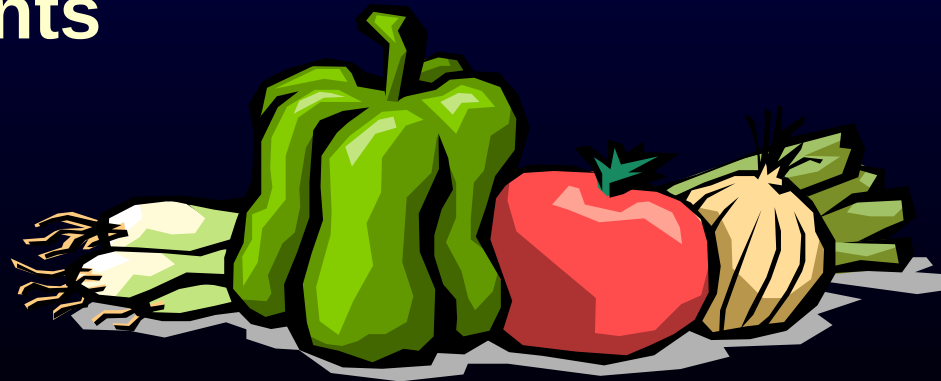
What we know from available research

Strategies to improve food environments

❖ Retail food environments

- ❖ Supermarkets: access, promoting healthy choices
- ❖ Small food store interventions
- ❖ Restaurants: focus on calorie menu labeling

❖ School food environments



Do new supermarkets in 'food deserts' improve diet and reduce obesity?

Foundation for Healthy Food Financing Initiative (HFFI)
& local government and foundation programs

2 recently published studies: T Dubowitz, S Matthews

- Increased awareness of food access
- Healthful food intake, lower BMI not attributed to new stores
- Positive & negative changes in food availability found





Related Findings



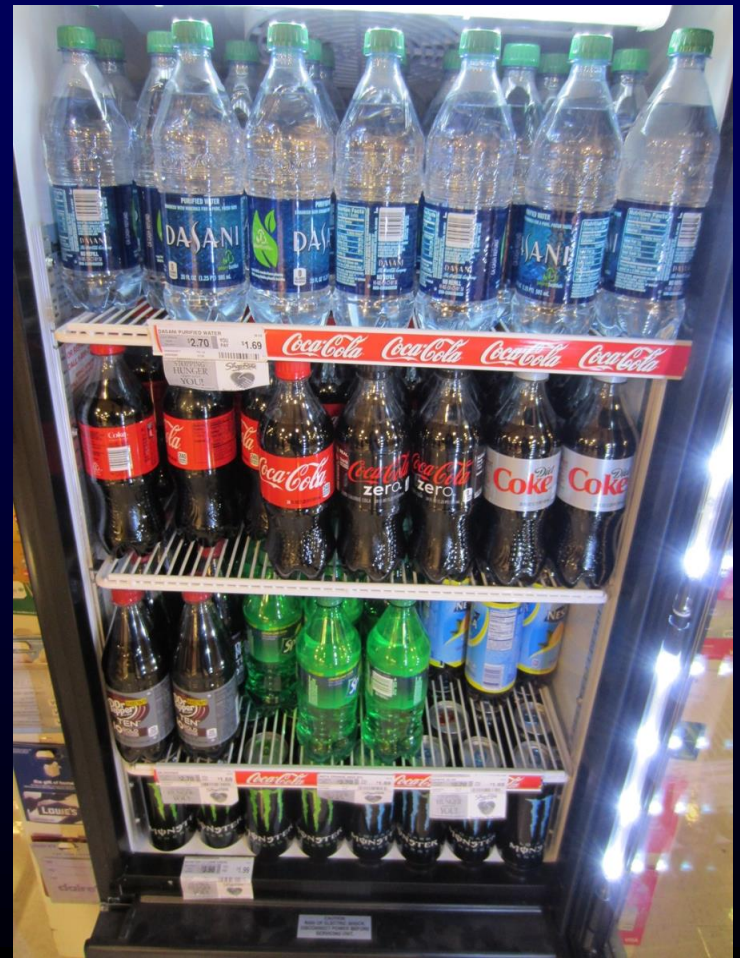
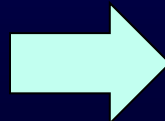
- Residents of food deserts buy most of their 'junk food' at supermarkets (Vaughn, ... Dubowitz, PHN 2016)
- Interventions **AT** supermarkets/retail stores have been found efficacious for greater purchase of healthy foods (Adam & Jensen, BMC Pub Health 2016, review of 42 studies)

Healthy Retail Solutions

Evaluate **placement and promotion strategies** to increase sales of healthier items, in supermarkets in low-income, ethnically diverse neighborhoods

1

Sample intervention: Checkout beverage cooler



Sample Intervention: Milk

After



Before
(Red=whole milk,
Green=skim milk)



Main Findings of HRS: Targeted Product Categories

Greater sales:

skim, 1% milk; water; 2 of 3 frozen entrees

No change in sales:

cereal, SSBs, diet beverages, whole/2% milk

AJCN. First published ahead of print April 2, 2014 as doi: 10.3945/ajcn.113.075572.

Placement and promotion strategies to increase sales of healthier products in supermarkets in low-income, ethnically diverse neighborhoods: a randomized controlled trial¹⁻³

Gary D Foster, Allison Karpyn, Alexis C Wojtanowski, Erica Davis, Stephanie Weiss, Colleen Brensinger, Ann Tierney, Wensheng Guo, Jeffery Brown, Carly Spross, Donna Leuchten, Patrick J Burns, and Karen Glanz

ABSTRACT

Background: The greater presence of supermarkets in low-income, high-minority neighborhoods has the potential to positively affect diet quality among those at greatest risk of obesity. In-store marketing strategies that draw attention to healthier products may be effective, sustainable, and scalable for improving diet quality and health. Few controlled studies of in-store marketing strategies to

studies have found that simply having access to a neighborhood supermarket did not affect residents' diet quality or risk of obesity (5-8), whereas others found positive effects (9). These data suggest that access alone may be necessary, but not sufficient, to drive healthier choices. Cummins et al recently suggested that complementary interventions, such as in-store stocking policies, are needed to help shoppers move from per-



Small Food Store Interventions (Corner Stores, Bodegas)

- Aim to increase access to healthful foods
- Usually in disadvantaged communities
- Impact on food availability, sales, diet?
 - Review of 16 trials (Gittelsohn et al., *PCD* 2012)
 - Stocking/availability of healthful foods usually increased
 - Manager-reported increases in sales of promoted foods
 - Limited data on purchase of promoted foods/impact on shopper consumption
 - Design & measurement limitations
 - Most were pre-post assessments

Large Studies of Urban Corner Store Initiatives (Philadelphia)

CPPW Scale-Up of Healthy Corner Stores Initiative (n=211 stores)



- Changes in food & beverage environments
 - greater fresh fruit availability & overall healthful availability scores
 - Modest effect sizes (Cavanaugh et al., Prev Med 2014)
- Changes in spending on purchases post-intervention
 - BL purchases mean \$ 2.81 and 643 kcal
 - Energy, nutrients, and total spending did not change from BL to FU (Lawman et al., Prev Med 2015)

RCT of a healthy corner store initiative on urban youth purchases

- No changes in energy content per purchase
- No changes in BMI z scores, obesity prevalence (Lent et al., Obesity 2014)



Restaurant Interventions



Calorie Menu Labeling

- Review of 16 studies (VanEpps et al, Curr Obes Rep 2015)
 - 4 studies found reduced energy intake of orders
 - 12 studies found non-significant effects or no effect
- Other considerations:
 - **Industry response to calorie menu labeling**
 - Current regulations are local; federal ACA rules were postponed from 2017-2018

School Food Environment Interventions



School Meal and Snack Regulations and Interventions

- 2010 Healthy, Hunger-Free Kids Act – updated nutrition standards of National School Lunch Program
- Policies implemented in 2012-2013

Findings from 12 urban, low-income schools

- Increased fruit consumption: 54% → 66% → 74%
- Decrease in vegetable choice but those who chose ate more
- Plate waste was lower

– Schwartz MB, Henderson KE, et al., *Childhood Obes*, 2015

Community Preventive Services Task Force (*Community Guide*)

Evidence review: Interventions to Support Healthier Foods and Beverages in Schools (2016)



Meal interventions,
F&V snack interventions

+ (25 studies)

Policies for healthier snack
foods/beverages sold or
used for rewards

? (11 studies)

Multicomponent interventions

+ (13 studies)

Interventions to increase
Water access in schools

? (2 studies)



Multicomponent community-wide programs



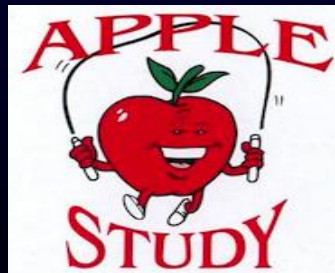
Findings from a recent systematic review & meta-analysis

[Wolfenden, Wyse, et al. *Prev Med* 2014]

- Population, whole-of-community interventions
- Weight gain PREVENTION, main focus on children
- 8 trials, non-randomized with comparison communities
- 7 trials had significant “+” effects
- Mean reduction in BMI z-scores = 0.09 (0.16 to 0.02 95% CI)

Research Limitations

- Hard to assess food environment changes
- Selection bias



Practice Limitations

- Modest changes
- Long-term sustainability?
- Scaling up beyond research

The signal and the noise

Signals of effectiveness

When environmental strategies

aren't found effective..... the reason(s) could be....

Research issues: Design, measures, execution

Strategy issues: implementation, dose/intensity, duration

Or it could be:

***** Wrong assumptions, not addressing key causes *****

the signal and the
and the noise and
the noise and the
noise and the no
why most noise a
predictions fail t
but some don't n
and the noise and
the noise and the
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Food justice, social justice, and other/unintended consequences



Right to healthy affordable food

Consumer right to know (menu/food labeling)

Hunger-free kids

Tax revenue to improve preschool education (+)

Job losses and net tax losses (-)



Unanswered questions

- *How much* environmental change is needed?
- *How long* will it take to improve behavior AND health?
- *Who changes* after environment/policy interventions? Do they reduce health inequity?





It illustrates the importance of perception
There is a fundamental error in separating the parts
from the whole
And the real elephant is the sum of its parts



Teaching elephants to dance!



What we observe is not nature itself, but nature exposed to our way of questioning
(W Heisenberg, 1933)



We must work constantly to prevent the demand for short-term results from undermining long-term process considerations
(JA Belasco, 1990)



Thank you!