

# **bridging the gap**

Research Informing Policies & Practices  
for Healthy Youth

## **Measuring the fast food environment**

**Results from a reliability study**

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# Presenter Disclosure

Christopher M. Quinn

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

**No relationships to disclose**



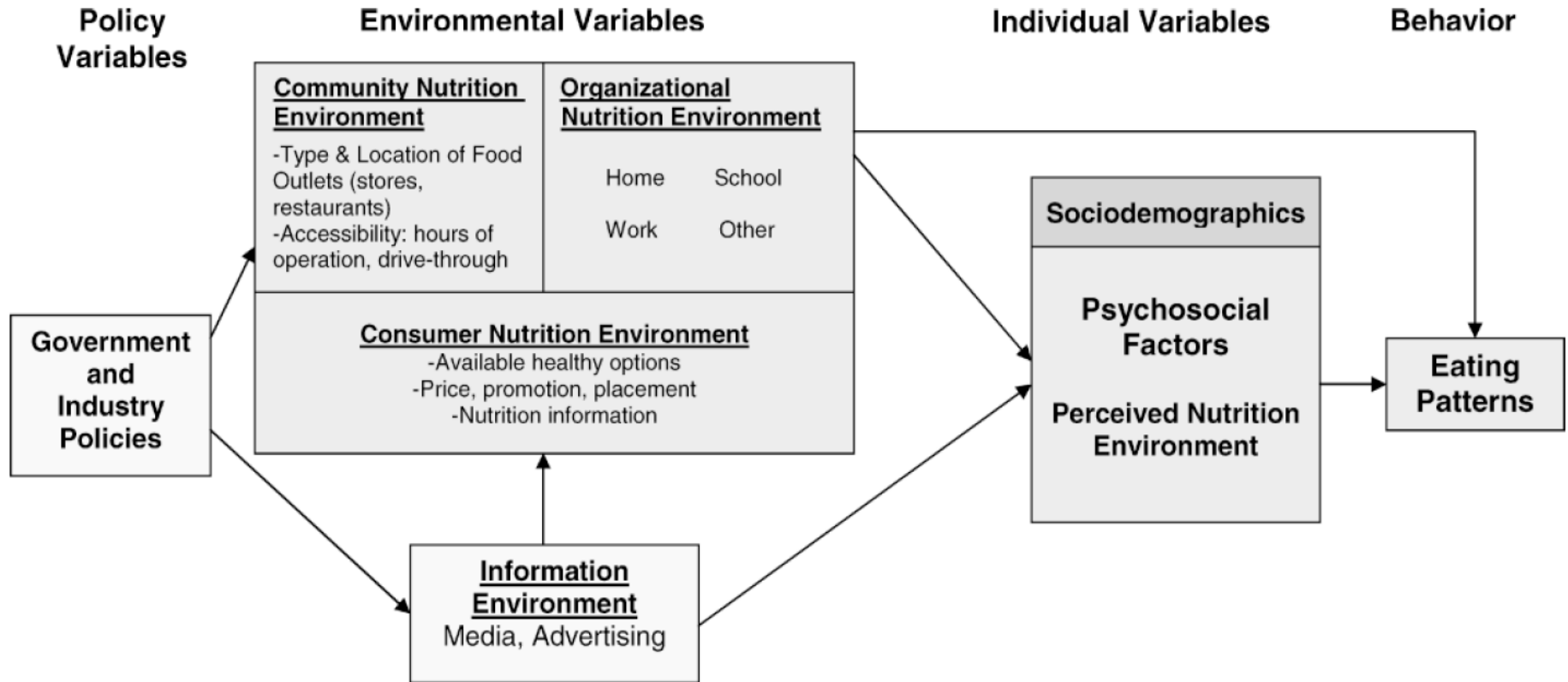
# Bridging the Gap

## Research Informing Practice and Policy for Healthy Youth

- A collaborative effort to assess the impacts of ***policies, programs & other environmental factors*** on a variety of adolescent health-related behaviors
- A RWJF initiative begun in 1997 with focus on adolescent alcohol, tobacco, and other drug use and related outcomes
- Expanded in recent years to include youth eating practices, physical activity, and weight outcomes
- Linked to the ongoing, NIDA-funded, *Monitoring the Future* study

# Background

Figure 1  
Model of Community Nutrition Environments



Source: Glanz et al. 2005

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# Background

- **Variability in consumer nutrition environment by community characteristics such as SES and race/ethnicity** (Morland et al. 2002, Block et al. 2004, Sturm 2007).
- **Location/density of food outlets alone does not explain trends in health outcomes or obesity** (Jeffery et al. 2006, Powell 2009).
- **Price of fast food has been linked to BMI of teenagers in longitudinal analyses** (Powell 2009) **and reported by youth in focus groups as an influence on consumption of fast food** (Barker et al. under development).
- **Relatively few studies involving direct observation of the consumer nutrition environment have documented the reliability of their measures** (Larson et al. 2009, Zenk et al. 2010, Ohri-Vachaspati & Leviton 2010).

# Instrument Development



Measures adapted from existing instruments:

Source	Instrument	Types of Measures
University of Pennsylvania (Glanz et al.)	Nutrition Environment Measures Survey – Restaurants (NEMS-R)	Restaurant Characteristics and Accessibility, Menu Review, Product Availability
Network for a Healthy California - CA Department of Public Health	Communities of Excellence in Nutrition, Physical Activity & Obesity Prevention (CX3) Fast Food Marketing Environment Survey	Advertising and Marketing, Menu labeling/Nutrition info measures

➤ Input was also provided by a panel of expert researchers, practitioners, and food policy advocates

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# Measures

- Exterior advertising and child-targeted marketing
- General menu and kids' menu review
- Food and beverage product availability and pricing
- Menu labeling and nutrition information at point-of-purchase
- Other restaurant characteristics and presence of incivilities



SECTION B. EXTERIOR MARKETING – SKIP THIS PAGE IF IN A MALL OR FOOD COURT				
	B1. Number of ads on Building Exterior		B2. Number of ads on Property	
a. Food only ads	[ ] [ ]		[ ] [ ]	
1. Includes a price promotion	[ ] [ ]		[ ] [ ]	
b. Beverage only ads	[ ] [ ]		[ ] [ ]	
1. Includes a price promotion	[ ] [ ]		[ ] [ ]	
c. Food and beverage ads	[ ] [ ]		[ ] [ ]	
1. Includes a price promotion	[ ] [ ]		[ ] [ ]	
<b>B3. Are there any ads with a ...</b>	NO	YES	IF YES, RECORD SPECIFIC WORDS AND PHRASES USED IN CLAIMS	
a. Dollar menu promotion?	0	1		
b. Health claim? <i>IF YES, RECORD WORDS IN B3b1</i>	0	1	B3b1. Specific Health Claims:	
c. Quality claim? <i>IF YES, RECORD WORDS IN B3c1.</i>	0	1	B3c1. Specific Quality Claims:	
<b>B4. Child-targeted marketing on building exterior or property?</b>	0	1	IF NO CHILD-TARGETED, SKIP TO SECTION C.	
<b>B5. Types of child-targeted marketing on building exterior or property</b>	NO	YES	COMMENTS:	
a. Exterior play area	0	1		
b. Indoor play area visible from outside	0	1		
c. 3-D cartoon character	0	1		
d. Poster with cartoon character(s)	0	1		
e. Poster with child-oriented TV or movie star(s)	0	1		
f. Poster showing kids' meal toy(s)	0	1		
g. Other, Specify:	0	1		

SECTION C. DRIVE-THRU								
C1. Does restaurant have a drive-thru?		C2. Does menu board provide calorie info for menu items?			C3. Does menu board have statement on suggested daily calories?		C4. Does menu board have "nutrition info on request" statement?	
NO SKIP TO SECTION D	YES	NO ITEMS	SOME ITEMS	ALL ITEMS	NO	YES	NO	YES
0	1	0	1	2	0	1	0	1

SECTION G. FOOD ITEMS	G1. Is item available?			G2. Record Price					
	NO	YES	N/A						
a. French Fries ( <i>select smallest available and specify below</i> ) <input type="checkbox"/> Small <input type="checkbox"/> Other:	0	1	8	\$ [ ] [ ] . [ ] [ ]					
b. French Fries ( <i>select largest available and specify below</i> ) <input type="checkbox"/> Large <input type="checkbox"/> Other:	0	1	8	\$ [ ] [ ] . [ ] [ ]					
c. Hamburger, ¼ lb with cheese	0	1	8	\$ [ ] [ ] . [ ] [ ]					
d. Chicken sandwich, with roasted/grilled chicken	0	1	8	\$ [ ] [ ] . [ ] [ ]					
e. Entrée salad, with roasted/grilled chicken	0	1	8	\$ [ ] [ ] . [ ] [ ]					
f. Fried Chicken, 1 leg/drumstick and 1 thigh	0	1	8	\$ [ ] [ ] . [ ] [ ]					
g. Cheese Pizza, thin crust, 10-12"	0	1	8	\$ [ ] [ ] . [ ] [ ]					
h. Taco, crunchy/crispy with ground beef	0	1	8	\$ [ ] [ ] . [ ] [ ]					
i. Sub Sandwich, 6-inch with turkey and cheese	0	1	8	\$ [ ] [ ] . [ ] [ ]					
SECTION H. KIDS MENU REVIEW				NO	YES				
H1. Kids' menu or kids' meal available <i>IF NO, SKIP TO SECTION J</i>				0	1				
H2. Kids' meal offers a healthy beverage option (i.e., low-fat milk or 100% juice) <i>IF NO, SKIP TO H3</i>				0	1				
a. Healthy option is the default beverage				0	1				
H3. Kids' meal offers a healthy side dish option (i.e., fruit, vegetable or yogurt) <i>IF NO, SKIP TO H4</i>				0	1				
a. Healthy option is the default side dish				0	1				
H4. Toys or other child-oriented giveaways included with kids' meal				0	1				
SECTION J. NUTRITION INFORMATION									
J1. Is item available at the POINT OF PURCHASE?	IF NO, SKIP TO NEXT ITEM		J2. Provides calorie info for menu items?			J3. Has statement on suggested daily calories?		J4. Has "nutrition info on request" statement?	
	NO	YES	NO ITEMS	SOME ITEMS	ALL ITEMS	NO	YES	NO	YES
a. Menu board	0	1	0	1	2	0	1	0	1
b. Food display tags	0	1	0	1	2	0	1		
c. Posted material	0	1	0	1	2	0	1		
d. Printed material	0	1	0	1	2	0	1	0	1
e. Printed menu*	0	1	0	1	2	0	1	0	1
J5. Asked employee for nutrition information? <i>IF PARTNER ASKED, CHECK <input type="checkbox"/></i>	NO	YES	b. Code final response: ( <i>Circle all that apply</i> )			c. Available at POP?			
	0	1	No nutrition information available			01	NO YES		
a. Record final response from employee(s):			Referred to posted material			02	0 1		
			Referred to printed material			03	0 1		
			Gave printed material from behind the counter			04			
			Ran out of printed material			05			
			Referred to website			06			
			Does not know			07			
Other, explain:			08						

# Reliability Study Objectives

- **Test the inter-rater reliability of direct observation measures in fast food restaurants**
  - **Identify unreliable or otherwise problematic measures**
  - **Test data collection procedures on a large scale in different types of chain restaurants**
  - **Collect feedback from data collection staff to improve form design, measure specifications, and training**
  - **Revise and refine training materials and presentations**

# Study Design and Methods

## Sample

- Chain fast food restaurants identified via web research
  - 24 brands
- Convenience sample (n=135) selected based on relative location and demographics:
  - Sample of census tracts stratified by income and racial/ethnic composition
  - ½ of tracts in city of Chicago, ½ in suburbs



# Chain Fast Food Brands



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# Study Design and Methods

## Data Collection Protocol

- 24 hours of classroom training and field practice for 6 data collectors
- Data collected over 2 weeks in December 2009
- 2 staff visited each restaurant and observed simultaneously
- Each pair observed a minimum of 40 restaurants, with 131 total restaurants observed across all pairs

Fast Food Restaurant Type	N
Burger and Fries	31
Fried Chicken/Fish	24
Mexican	13
Chinese/Pan-Asian	9
Sandwich/Sub	26
Pizza	13
Donut/Coffee Shop	10
Other	5
Total Completed Observations	131

# Study Design and Methods

## Analysis

- **Categorical variables:**
  - **Simple Kappa**
  - **Proportion of Agreement**
- **Continuous variables:**
  - **Intraclass Correlation (ICC)**

Strength	Values
Poor	$\leq 0.0$
Slight	.01 - .20
Fair	.21 - .40
Moderate	.41 - .60
Substantial	.61 - .80
Almost Perfect	.81 - 1.0

# Results – Exterior Advertising

Measure	ICC for ads on Building Exterior	ICC for ads on Property
Count of food-only ads	0.75	0.85
Count of beverage-only ads	0.68	0.79
Count of food <u>and</u> beverage ads	0.48	0.51

Measure	Kappa	Total agreement
Any ads with dollar menu promotion	0.82	0.94
Any ads with <u>health</u> claim	0.85	0.97
Any ads with <u>quality</u> claim	0.35	0.81

# Results - Child-targeted Marketing

Measure	Kappa	Total agreement
Any child-targeted marketing	0.62	0.87
Poster with cartoon character(s)	0.86	0.93
Poster with child-oriented TV or movie star(s)	0.81	0.93
Poster showing kids' meal toy(s)	0.86	0.93
Interior Play area	0.79	0.98
Exterior Play area	*	1.0
3-D cartoon character	*	1.0

\* Negative agreement only, Kappa calculation not possible

# Results – Menu Labeling

Item at Point of Purchase	Calorie information provided (None, Some, or All items)		States “Nutrition Info is Available Upon Request”	
	Kappa	Total agreement	Kappa	Total agreement
Interior Menu Board	<b>0.77</b>	0.92	<b>0.79</b>	0.98
Posted Material	0.60	0.84	0.49	0.97
Printed Material	<b>0.89</b>	0.94	N/A	
Food Display Tags	*	1.0	N/A	
Printed Menu	*	1.0	*	1.0
Drive-thru menu board	<b>1.0</b>	1.0	<b>0.73</b>	0.96

\* Negative agreement only, Kappa calculation not possible

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# Results – Menu Review

Measure		Kappa	Total agreement
General Menu Review	Restaurant has Dollar/Value menu	<b>0.77</b>	0.88
	Healthy option on Dollar/Value menu	0.53	0.78
	Any salad options	<b>0.94</b>	0.97
	Any vegetable sides (non-fried, w/o sauce)	<b>0.70</b>	0.85
	Any unsweetened fruit sides	<b>0.97</b>	0.98
Kids' Menu Review	Restaurant has Kids' meal	<b>0.98</b>	0.99
	Kids' meal offers healthy beverage option	<b>0.85</b>	0.93
	Kids' meal offers healthy side dish option	<b>0.83</b>	0.93
	Toys or other child-oriented giveaways included	<b>0.87</b>	0.94

# Results – Menu Review

Measure		Kappa	Total agreement
Menu designations for healthier options	Low fat	0.81	0.91
	Low carbohydrate	0.92	0.99
	Low calorie or “light”	0.79	0.91
	Low saturated fat	*	1.0
	Low sodium	*	1.0
	Heart healthy	*	1.0
Other characteristics	Self-service fountain drinks	0.98	0.99
	Free water for customers	0.86	0.93
	Sweets for sale at counter	0.86	0.93

\* Negative agreement only, Kappa calculation not possible

# Additional Results

- Measures of **beverage product availability** were **highly reliable** (Kappa between 0.78 and 1; Total agreement between 0.91 and 1.0)
- Measures of **food item availability** were also **highly reliable** (Kappa between 0.92 and 0.99; Total agreement between 0.95 and 0.99)
- Measures of **restaurant accessibility**, including presence of parking, sidewalk on street, bicycle parking, and drive-thru had **mixed reliability** (Kappa between 0.56 and 0.97; Total agreement between 0.90 and 0.99)
- Measures of **incivilities** such as graffiti on restaurant exterior, bars on windows, or security barrier at interior service counter also had somewhat **mixed reliability** (Kappa between 0.62 and 1.0; Total agreement between 0.96 and 1.0)

# Reliability Study Limitations

- **No non-chain (i.e., independent) fast food restaurants included in the reliability study**
- **Sample limited to one metro region, and census-defined rural areas not included**
- **No non-traditional fast food (e.g., quick service food counters w/in convenience stores) unless branded**
- **Pricing measures not reported due to data collection methodology– need for additional reliability testing**
- **No test-retest reliability**

# Changes to the 2010 Instrument

- Revised exterior advertising categories
- Dropped quality claims
- Refined types of child-targeted marketing included
- Tightened definitions of healthy options (i.e., vegetable, fruit, or yogurt sides)
- Tightened definitions for accessibility and incivility measures, including sidewalk on street, bicycle parking, and graffiti
- Refined training protocol for menu labeling measures
- Plan for additional reliability testing of price measures in chain and non-chain restaurants in 2011

# BTG Contributions to the field: Fast Food Observation Form

- **Comprehensive assessment of environment *within* fast food restaurants**
- **Measurement of the extent of exterior advertising**
- **Presence of several forms of child-targeted marketing inside and outside restaurants**
- **Menu labeling at point of purchase, including drive-thru**
- **National data on food and beverage product prices**
- **Examine variation in chain and non-chain restaurants nationally and across communities**

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# Thank you!

Find out more at [bridgingthegapresearch.org](https://bridgingthegapresearch.org)

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