Results from Reliability Studies in Food Stores and Fast Food Restaurants

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Presentation Objectives

- Describe two observational data collection instruments used for assessing the community food environment
- Describe protocol for two reliability studies
- Summarize results from two reliability studies
- Describe changes made to data collection instruments/protocols based on study findings and current/future research plans
Data Collection Instrument

• 12-page instrument developed and tested, building off pre-existing instruments and on input from an expert panel

• Types of measures included
  o Store type
  o Number of cash registers
  o Presence of store services/amenities
  o Availability of various food, beverage, and tobacco products
  o Price of various food, beverage, and tobacco products
  o Number of food, beverage, and tobacco advertisements on store exterior
  o Quality of select fresh fruits and vegetables
  o Number of varieties of fresh, frozen, and canned fruits and vegetables
  o Presence of any tobacco-related promotions
  o Presence of incivilities outside the store
**BTG-COMP FOOD STORE OBSERVATION FORM – Jan 2010**

**BUSINESS NAME:**

**ADDRESS:**

**START TIME:** ____________ am/pm **END TIME:** ____________ am/pm **DATE:** ____________ / ____________ / 2010

**FINAL STATUS CODE**

- COMPLETE: 01
- INCOMPLETE – Not found: 02
- INCOMPLETE – Not safe to go in: 03
- INCOMPLETE – Outside of business hours: 05
- INCOMPLETE – Ran out of time: 06
- NOT ELIGIBLE – Permanently closed / does not exist: 96
- Other, Explain: 07

**LABEL CORRECTIONS/NOTES**

**A. GENERAL AND CHECK-OUT**

**A1. TYPE OF STORE**

- Supermarket (Jewel-Osco, Kroger, Safeway) 1
- Grocery (Aldi, Trader Joe’s, “mom & pop”) 2
- Convenience (7-11, White Hen) 3
- Discount Dept Store (Kmart, Target, Wal-Mart) 4
- Other (Specify): 5

**A2. Does the store have a...?**

- a. Bank: 0 1
- b. Pharmacy: 0 1
- c. Butcher or fresh meat counter: 0 1
- d. Deli counter: 0 1
- e. Bakery: 0 1

**A3. Are these available at CHECK-OUT?**

- a. Candy: 0 1
- b. Refrigerated beverages: 0 1
- c. Bottled water: 0 1
- d. Sweetened beverages (soda, etc.): 0 1
- e. At least one candy-free register: 0 1

**A4. Is there a plexiglass or other divider at the register?**

**A5. Is there signage for...?**

- a. Food stamps (EBT or SNAP): 0 1
- b. 1. Specify sign location:
- c. WIC coupons: 0 1
- d. 1. Specify sign location:

**A6. Number of cash registers**

**IF MORE THAN 10, RECORD 10**

**F. BEVERAGES (JUICE, SODA, WATER, etc.) – FAMILY SIZE**

<table>
<thead>
<tr>
<th>F1. AVAILABLE</th>
<th>F2. BRAND</th>
<th>F3. QTY</th>
<th>F4. PACKAGE SIZE</th>
<th>F5. CURRENT PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO YES</td>
<td>IF None, SKIP F2-F5</td>
<td>IF None, SKIP F4-F5</td>
<td>REG SALE MEMBER</td>
<td></td>
</tr>
<tr>
<td>a. Orange Juice, 100%</td>
<td>0 1</td>
<td>Min Maid</td>
<td>½ Gallon</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>b. Juice Drink, 10-50% juice</td>
<td>0 1</td>
<td>Tropicana</td>
<td>½ Gallon</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>c. Juice box/pouch ≤ 10% juice</td>
<td>0 1</td>
<td>Capri Sun</td>
<td>Case of 12</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>d. Powdered Drink mix</td>
<td>0 1</td>
<td>Kool-Aid</td>
<td>1-9.2 oz</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>e. Soda, regular</td>
<td>0 1</td>
<td>Coca-Cola</td>
<td>2 Liter 1</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>f. Soda, diet</td>
<td>0 1</td>
<td>Pepsi</td>
<td>24 can case 1</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>g. Soda, least expensive</td>
<td>0 1</td>
<td>Specify brand</td>
<td>2 Liter</td>
<td>$1.00 1 2 3</td>
</tr>
</tbody>
</table>

**G. SNACKS**

<table>
<thead>
<tr>
<th>G1. AVAILABLE</th>
<th>G2. BRAND</th>
<th>G3. QTY</th>
<th>G4. PACKAGE SIZE</th>
<th>G5. CURRENT PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO YES</td>
<td>IF None, SKIP G2-G5</td>
<td>IF None, SKIP G4-G5</td>
<td>REG SALE MEMBER</td>
<td></td>
</tr>
<tr>
<td>a. Potato Chips, regular, salted</td>
<td>0 1</td>
<td>Lay’s</td>
<td>14 oz 1</td>
<td></td>
</tr>
<tr>
<td>b. Flaming Hot Cheetos (or equiv.)</td>
<td>0 1</td>
<td>Frito Lay</td>
<td>8-9 oz</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>c. Any baked or low-fat potato chips</td>
<td>0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Snack Cakes (Ho Hos, Cupcakes or Swiss Rolls)</td>
<td>0 1</td>
<td>Hostess</td>
<td>13-14.5 oz</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>e. Cookies</td>
<td>0 1</td>
<td>Chips Ahoy</td>
<td>14-16 oz</td>
<td>$1.00 1 2 3</td>
</tr>
<tr>
<td>f. Candy</td>
<td>0 1</td>
<td>M&amp;M’s, plain</td>
<td>1.69 oz</td>
<td>$1.00 1 2 3</td>
</tr>
</tbody>
</table>

**Page 5 of 12**

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**Study Sample**

- Businesses pulled from Dun & Bradstreet for specific SIC codes
  - Supermarket
  - Grocery store
  - Convenience store
  - Gas station
- Web searches conducted to identify department stores
- Included businesses in City of Chicago plus a 50-mile buffer
- Pulled convenience sample based on relative location and based on the following distribution:
  - 1/3 in low, 1/3 in middle, and 1/3 in high income areas
  - 50% in predominantly white and 50% in non-white areas
  - 50% in city limits and 50% outside city limits (All classified as “urban”)
Food Store Reliability Study

Data Collection Protocol

• Trained six data collectors
• Data collection during a two-week period in January 2010
• Each team member independently observed/coded each store
• Data collection completed in 120 stores
• Average time to complete observation:
  o 97 minutes in supermarkets (n = 20)
  o 96 minutes for department stores (n = 6)
  o 68 minutes in grocery stores (n = 23)
  o 44 minutes for gas/convenience stores (n = 66)
  o 38 minutes for other stores (n = 4)
Average reliability for measures of availability

<table>
<thead>
<tr>
<th>Measure (# items)</th>
<th>Kappa</th>
<th>% Agreement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>All products (53)</td>
<td>0.88</td>
<td>95%</td>
<td>0.17 - 1.00</td>
</tr>
<tr>
<td>Fresh fruits (4)</td>
<td>0.97</td>
<td>99%</td>
<td>0.91 - 1.00</td>
</tr>
<tr>
<td>Fresh vegetables (6)</td>
<td>0.97</td>
<td>98%</td>
<td>0.94 - 1.00</td>
</tr>
<tr>
<td>Meat and dairy* (9)</td>
<td>0.91</td>
<td>96%</td>
<td>0.80 - 1.00</td>
</tr>
<tr>
<td>Bread and cereal (5)</td>
<td>0.87</td>
<td>95%</td>
<td>0.81 - 0.93</td>
</tr>
<tr>
<td>Canned products (6)</td>
<td>0.90</td>
<td>95%</td>
<td>0.80 - 0.96</td>
</tr>
<tr>
<td>Beverages* (8)</td>
<td>0.66</td>
<td>89%</td>
<td>0.17 - 0.82</td>
</tr>
<tr>
<td>Snack products* (3)</td>
<td>0.86</td>
<td>96%</td>
<td>0.82 - 0.91</td>
</tr>
<tr>
<td>Frozen vegetables (4)</td>
<td>0.94</td>
<td>97%</td>
<td>0.91 - 0.98</td>
</tr>
<tr>
<td>Tobacco products* (8)</td>
<td>0.92</td>
<td>96%</td>
<td>0.84 - 1.00</td>
</tr>
</tbody>
</table>

* PABAK measure utilized for some products in this category
# Average reliability for measures of product price

<table>
<thead>
<tr>
<th>Measure</th>
<th>ICC</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh fruits (4)</td>
<td>0.87</td>
<td>0.58 - 0.98</td>
</tr>
<tr>
<td>Fresh vegetables (4)</td>
<td>0.95</td>
<td>0.87 - 1.00</td>
</tr>
<tr>
<td>Meat and dairy (9)</td>
<td>0.92</td>
<td>0.84 - 1.00</td>
</tr>
<tr>
<td>Bread and cereal (4)</td>
<td>0.91</td>
<td>0.82 - 1.00</td>
</tr>
<tr>
<td>Canned products (3)</td>
<td>0.95</td>
<td>0.90 - 1.00</td>
</tr>
<tr>
<td>Beverages* (16)</td>
<td>0.85</td>
<td>0.15 - 1.00</td>
</tr>
<tr>
<td>Snack products (5)</td>
<td>0.84</td>
<td>0.51 - 0.99</td>
</tr>
<tr>
<td>Frozen vegetables *(1)</td>
<td>0.99</td>
<td>--</td>
</tr>
<tr>
<td>Tobacco products* (5)</td>
<td>0.93</td>
<td>0.87 - 1.00</td>
</tr>
</tbody>
</table>

*Excludes some measures for which ICC could not be calculated due to small sample size
Average reliability for counts

<table>
<thead>
<tr>
<th>Measure (# items)</th>
<th>ICC</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td># of fruit options available (3)</td>
<td>0.95</td>
<td>0.92 - 0.97</td>
</tr>
<tr>
<td># of vegetable options available (3)</td>
<td>0.93</td>
<td>0.92 - 0.95</td>
</tr>
<tr>
<td># of ads on building exterior (4)</td>
<td>0.91</td>
<td>0.78 - 0.98</td>
</tr>
<tr>
<td># of ads on store property (4)</td>
<td>0.86</td>
<td>0.68 - 0.97</td>
</tr>
</tbody>
</table>
Revisions to Instrument and Protocol

• Dropped several measures from instrument
  • Availability for some beverage products
  • Price for some food/beverage products
  • Availability of green/orange vegetables
  • Price for some tobacco products
  • Exterior advertising for some tobacco products

• Retrained on protocol for recording current price

• Revised priority brands and package sizes for several products

• Added a maximum count for exterior advertisements

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Fast Food Reliability Study
December 2009
Data Collection Instrument

• 4-page instrument developed and tested, building off pre-existing instruments and input from an expert panel

• Types of measures included
  o Restaurant type, Layout
  o Availability of various food and beverage menu items
  o Availability of healthy options on dollar menu, kids’ menu
  o Presence of any health claims on menu board and/or in advertisements
  o Availability of nutrition information
  o Price of various food and beverage menu items
  o Number of food, beverage, and other advertisements on exterior
  o Presence of child-targeted marketing
  o Presence of incivilities outside the restaurant
### SECTION A. EXTERIOR CHARACTERISTICS

#### A1. Restaurant type
- Traditional Burger and Fries: 1
- Mexican: 2
- Fried Chicken / Fried Fish: 3
- Sandwich or Sub Shop: 4
- Pizzeria: 5
- Chinese / Pan-Asian: 6
- Coffee Shop: 7
- Other, Specify: 8

#### A2. Is the restaurant...
- NO: 0
- YES: 1
  - In a shared space with a grocery or general merchandise store: 0
  - In a shared space with a gas station or convenience store: 0
  - In a shared space with another restaurant: 0
  - Within a food court or mall: 0

#### A3. Does the restaurant have...
- NO: 0
- YES: 1
  - A sidewalk present on street: 0
  - Sidewalk lighting: 0
  - Parking on site: 0
  - Parking lot lighting: 0
  - Bicycle parking: 0
  - Bars on windows: 0

#### A4. Is there graffiti on building and/or exterior signs?
- Virtually none: 0
- In a few areas: 2
- In some areas: 3
- In most areas: 4

#### A5. Number of exterior walls visible from parking lot or street.
- 0

### SECTION B. FOOD ITEMS

- G1. Is item available?
  - NO: 0
  - YES: 1
  - N/A: 8
  - French Fries (select smallest available and specify below)
    - Small: 0
    - Large: 0
  - Hamburger, ¼ lb with cheese: 0
  - Chicken sandwich, with roasted/grilled chicken: 0
  - Entree salad, with roasted/grilled chicken: 0
  - Fried Chicken, 1 leg/drumstick and 1 thigh: 0
  - Cheese Pizza, thin crust, 10-12": 0
  - Taco, crunchy/crispy with ground beef: 0
  - Sub Sandwich, 6-inch with turkey and cheese: 0

- G2. Record Price

### SECTION C. NUTRITION INFORMATION

- J1. Is item available at the POINT OF PURCHASE?
  - NO: 0
  - YES: 1
  - French Fries (select smallest available and specify below)
  - French Fries (select largest available and specify below)
  - Hamburger, ¼ lb with cheese
  - Chicken sandwich, with roasted/grilled chicken
  - Entree salad, with roasted/grilled chicken
  - Fried Chicken, 1 leg/drumstick and 1 thigh
  - Cheese Pizza, thin crust, 10-12"
  - Taco, crunchy/crispy with ground beef
  - Sub Sandwich, 6-inch with turkey and cheese

- J2. Provides calorie info for menu items?

- J3. Has statement on suggested daily calories?

- J4. Has *nutrition info on request* statement?

### SECTION D. KIDS MENU REVIEW

- H1. Kids’ menu or kids’ meal available: 0
- H2. Kids’ meal offers a healthy beverage option (i.e., low-fat milk or 100% juice): 0
- H3. Kids’ meal offers a healthy side dish option (i.e., fruit, vegetable or yogurt): 0
- H4. Toys or other child-oriented giveaways included with kids’ meal: 0

### SECTION E. STAFF ID:

#### Business Name: Setting ID: Staff ID:
Study Sample

- Web searches conducted to identify top 36 fast food restaurant chains in Chicago and selected suburbs within the Chicago MSA
- Convenience sample based on relative location
- Restaurants distributed by income and location:
  - 1/3 in low, 1/3 in middle, and 1/3 in high income areas
  - 50% located in predominantly white tracts, 50% in non-white tracts
  - 50% located in Chicago, 50% located in suburbs

Note: all locations “urban” according to Census definition
Data Collection Protocol

- Trained six data collectors
- Data collection during a two-week period in December 2009
- Each team member independently observed/coded each restaurant
- Completed data collection in 130 restaurants
- Average time to complete fast food observation:
  - Mean = 26 minutes (SD = 8.3 minutes, Range = 6 - 48 minutes)
## Average reliability for interior characteristics

<table>
<thead>
<tr>
<th>Measure (# items)</th>
<th>Kappa</th>
<th>% Agreement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu review (7)</td>
<td>0.79</td>
<td>91%</td>
<td>0.53 - 0.96</td>
</tr>
<tr>
<td>Kids’ menu review (6)</td>
<td>0.84</td>
<td>94%</td>
<td>0.50 - 1.00</td>
</tr>
<tr>
<td>Health claims on menu (7)</td>
<td>0.88</td>
<td>95%</td>
<td>0.64 - 1.00</td>
</tr>
<tr>
<td>Other characteristics (6)</td>
<td>0.92</td>
<td>97%</td>
<td>0.86 - 1.00</td>
</tr>
</tbody>
</table>
Reliability for availability of nutrition information

<table>
<thead>
<tr>
<th>Measure</th>
<th>Kappa</th>
<th>% Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence at point of purchase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menu board</td>
<td>1.00</td>
<td>100%</td>
</tr>
<tr>
<td>Food display tags</td>
<td>0.91</td>
<td>96%</td>
</tr>
<tr>
<td>Posted material</td>
<td>0.59</td>
<td>86%</td>
</tr>
<tr>
<td>Printed material</td>
<td>0.78</td>
<td>90%</td>
</tr>
<tr>
<td>Printed menu* (PABAK)</td>
<td>0.97</td>
<td>98%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure</th>
<th>ICC</th>
<th>% Agreement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of calorie info (4)</td>
<td>0.88</td>
<td>93%</td>
<td>0.77 - 1.00</td>
</tr>
</tbody>
</table>

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# Average reliability for exterior advertisements

<table>
<thead>
<tr>
<th>Measure</th>
<th>ICC/Kappa</th>
<th>% Agreement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td># of ads on building exterior (3)</td>
<td>0.77</td>
<td>81%</td>
<td>0.65 - 0.86</td>
</tr>
<tr>
<td># of ads on property (3)</td>
<td>0.82</td>
<td>87%</td>
<td>0.67 - 0.91</td>
</tr>
<tr>
<td># of ads with price promotion (4)</td>
<td>0.78</td>
<td>76%</td>
<td>0.60 - 0.89</td>
</tr>
<tr>
<td>Other ad characteristics (4)</td>
<td>0.66</td>
<td>90%</td>
<td>0.35 - 0.95</td>
</tr>
</tbody>
</table>

Excludes some measures for which ICC could not be calculated due to small sample size
Revisions Made to Instruments and Protocol

- Changed approach to “healthy” sides/beverages
- Changed approach to coding food/beverage advertisements
- Changed approach to child-targeted marketing
- Dropped quality claims from exterior advertising section
- Retrained on nutrition information at the point of purchase
- Tightened definitions and training on measures of incivilities
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• Lisa Powell, PhD
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Expert Panel:
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• Joel Gittelsohn, PhD
• Karen Glanz, PhD, MPH
• Punam Ohri-Vachaspati, PhD, RD
• Valerie Quinn, MPH
• Donald (Diego) Rose, PhD, MPH
• Joe Sharkey, PhD, MPH, RD
• Mary Story, PhD, RD
Thank you!

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