

The Impact of Street Advertising on Physical Activity, Sedentary Behavior and Weight Among Youth

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Presenter Disclosures: Sandy Slater and All Co-Authors

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

No relationships to disclose.



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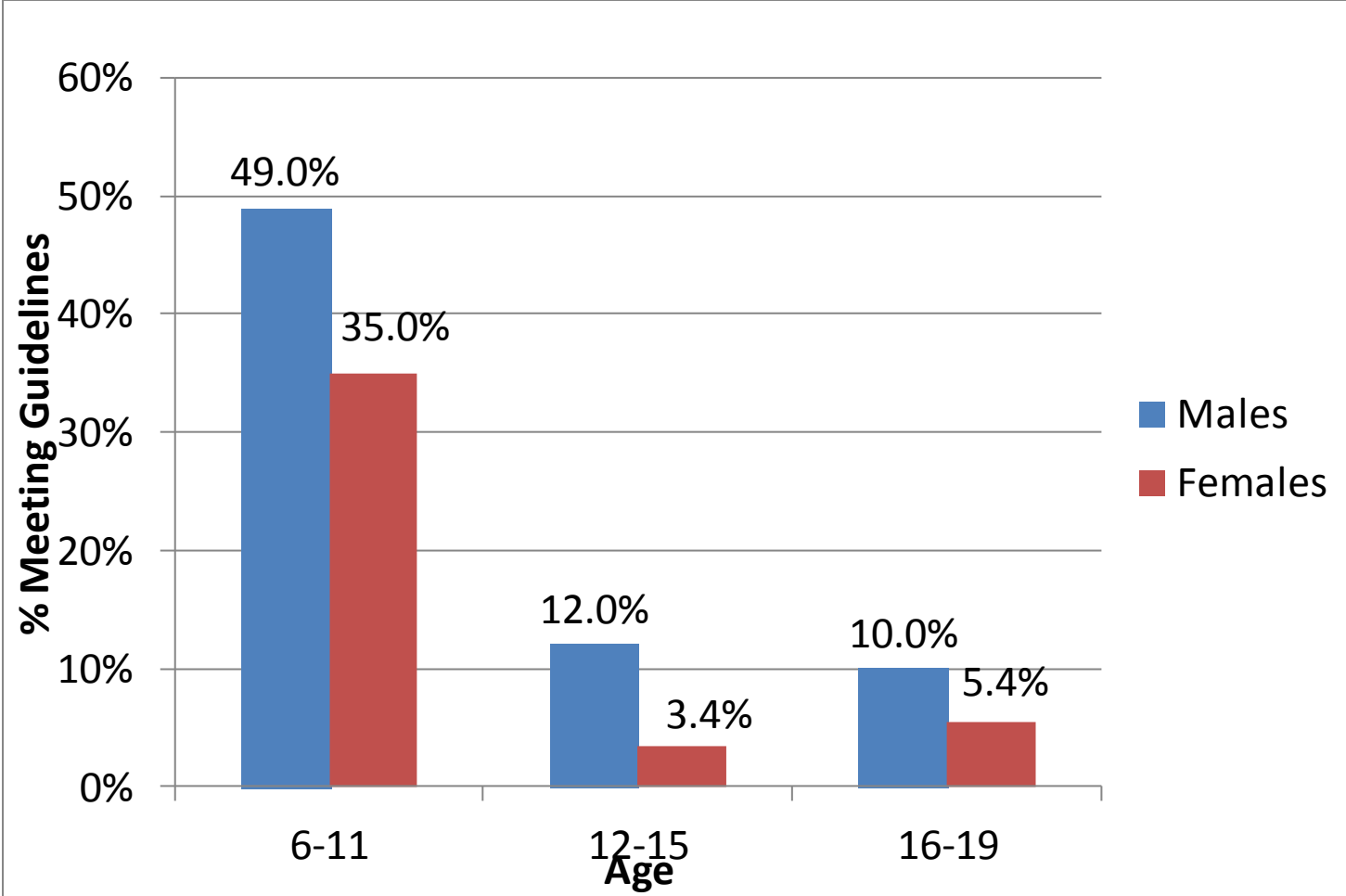
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Youth Health Behavior **Background**


Percent of Youths Meeting Physical Activity Guidelines Declines with Age




Troiano R, Berrigan D, Dodd K, et al. "Physical Activity in the United States Measured by Accelerometer." *Medicine & Science in Sports & Exercise*, 40(1): 181-188, January 2008.

This data was measured by accelerometers.

Among all 8- to 18-year-olds, average amount of time spent with each medium in a typical day:



	2009	2004	1999
TV content	4:29	3:51	3:47
Music/audio	2:31	1:44	1:48
Computer	1:29	1:02	0:27
Video games	1:13	0:49	0:26
Print	0:38	0:43	0:43
Movies	0:25	0:25	0:18
Total media exposure	10:45	8:33	7:29
Multitasking proportion	29%	26%	16%
 Total media use	7:38	6:21	6:19

Rideout et al., 2010

Sedentary Time

- Children and adolescents spend an average of 6-8 hours per day being sedentary
 - Sedentary commute to school
 - Sitting in class (about 50% of time in school sedentary)
 - Sedentary homework
 - Sedentary discretionary time
- Sedentary Behavior has health risks independent of PA
 - SB >2 hrs per day is associated with unfavorable body composition, decreased fitness, decreased self esteem, decreased pro-social behavior, decreased academic achievement (Tremblay et al. 2011)

Background on Advertising

- Research has shown the impact of magazine and t.v. advertising on weight, and there is emerging evidence linking the impact of outdoor food marketing on health outcomes.
- Evidence from the social marketing VERB campaign shows that providing communities with a higher dose of PA marketing activities and sustaining those activities over time yields more positive health outcomes (Berkowitz et al., 2008).
- Only one study (Yancey et al., 2009) has examined outdoor advertising related to the marketing of sedentary entertainment and transportation. No research to date has examined the association between the marketing of PA and sedentary activities and youth physical activity, sedentary behavior and weight.

Background on Street Advertising

□ Findings from Yancey et al. 2009

- Ads clustered around child-serving institutions (schools, day cares, rec centers & libraries)
- Large variations in advertising density across neighborhoods
- Importance of zoning and land use regulations to protect children from unhealthy exposure
- No research to date has examined the association between the marketing of PA and sedentary activities and youth physical activity, sedentary behavior and weight.
- Building on limited existing evidence, this is the first study to examine the impact street advertising of sedentary entertainment, as well as physical activity products/brands, services and facilities on youth physical activity and sedentary behavior, and weight.



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The Research Study

Study Purpose

- We draw from the social marketing literature to frame the study.
 - Social marketing combines ideas from commercial marketing and the social sciences to present information in a way so as to influence behavior.
 - Social marketing is increasingly being advocated as a core public health strategy for influencing voluntary lifestyle behaviors such as physical activity.

Research Aims

□ To test the following hypotheses:

➤ **H1:** Communities with higher levels of screen entertainment and cell phone street-level advertising will be associated with decreased physical activity and increased sedentary behavior and weight.

➤ **H2:** Communities with higher levels of physical activity products/brands, services and facilities street-level advertising will be associated with increased physical activity and decreased sedentary behavior and weight.

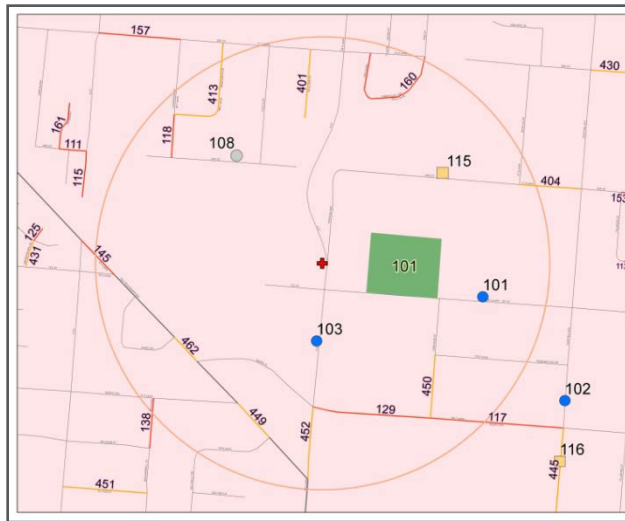
The Sample

- ❑ Data were collected in 2011 and 2012 from a National Sample of 8th, 10th and 12th Grade Students attending Public Schools (N=35,472 students and 313 school enrollment zones):
 - 12.2 % of the adolescents are obese.
 - 59.6% White
 - 11.5% African American
 - 14.8% Latino
 - 34.6% 8th Graders
 - 33.7 % 10th Graders
 - 31.7% 12th Graders
 - 49% Male
 - 72.6% have parents who attended some college or more

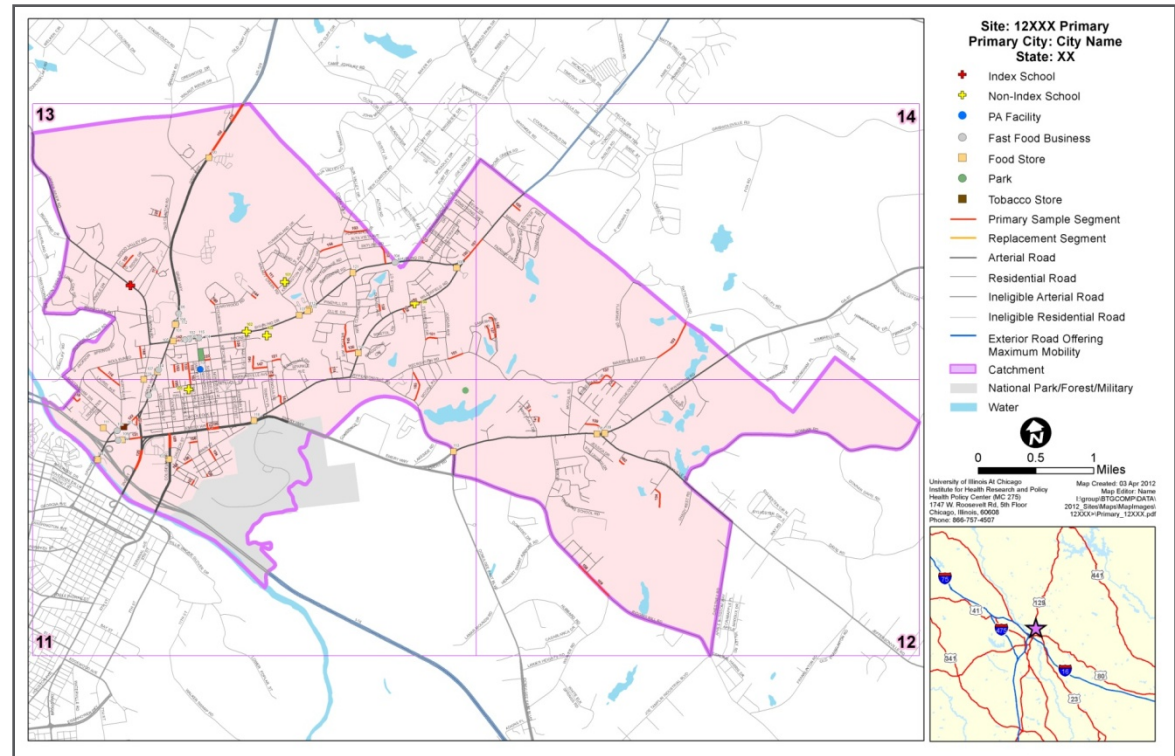
The BTG-COMP Survey Data

- For the ¼ mile buffer around schools a census of street segments were audited.
- For the school enrollment zone a random sample of street segments was drawn based on the proportion of population of youth (aged 0-17 years) associated with the nearest census block to the street segment; segments were then weighted to account for their probability of selection; and then aggregated to construct community-level measures representing, for example the proportion of streets, in a community, having screen entertainment ads.
- Poisson cross-sectional analyses were conducted using survey commands in Stata 13.0 to obtain incidence rate ratios (IRR). Sampling weights were used and clustering of schools/communities was accounted for in the models.
- All models controlled for gender, race/ethnicity, grade, parental education, community-level median household income, perceived neighborhood safety, region, and community-level sprawl.

Quarter-Mile Buffer



School Enrollment Zone



Street Advertising Audit Tool

E. STREET ADVERTISING GRID 2012 - STREET SEGMENT																SEG ID: 1 0 - 1 2 - - -															
Ad Number	E1. Content of Ad – CODE ALL THAT APPLY <i>FOR BEVERAGES, RECORD BRAND(S) AND PRODUCT(S). FOR HEALTH or ANTI-TAX MESSAGE, RECORD SPONSOR(S).</i>														E2. Ad Placement			E3. Ad Size													
	Beverages						Health or Anti-Tax Message						m. Person(s) Being Active	n. Includes a Price Promo	Free-standing	Attached to a wall	Attached to something else	Billboard or larger	Smaller than a billboard <72 sq feet												
	a. Regular Soda	a1. Diet Soda	b. Regular Energy Drink	c. Other Non-alcoholic	d. Quick Service Restaurant	e. Food Store (w/food/bev)	f. PA Product or Brand	g. PA Service, Facility or Participatory Event	h. Nutrition, Healthy Eating, Healthy Weight	i. Exercise, Physical Activity	j. Tobacco-free Lifestyle	j1. Anti-tax Message (food/bev/tobacco)								k. Screen Entertainment	l. Cell Phone										
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NOTES:

Physical Activity

- ❑ Any ad that promotes a:
 - ✓ Physical activity-related (PA) product or brand
 - ✓ Physical activity-related service, facility, or participatory event
 - ❑ May or may not also include a health message
 - ❑ May or may not also include image of a person being active

Screen Entertainment

- ❑ Includes any ad that advertises an entertainment product viewed on a screen:
 - ✓ TV shows and televised sporting events
 - ✓ Movies and movie theatres
 - ✓ Computer and video games and gaming devices
 - ✓ Cable/internet service
 - ✓ Websites
- ❑ EXCLUDES ads promoting tickets to a live sporting event

Examples of Street Ads

Street Advertising on Billboards and other Signage

- ❑ Two sets of advertising measures were constructed: 1) ¼ mile density surrounding the school, and 2) the proportion of streets within the school enrollment zone.
- ❑ Most Communities had less than one ad in the ¼ mile buffer
 - Physical Activity Product or Brand (Range: 0-5 ads)
 - Physical Activity Service, Facility or Event (Range: 0-10 ads)
 - Screen Entertainment (Range: 0-10 ads)
 - Cell Phones (Range: 0-15 ads)
- ❑ Most communities had ads on 1 percent or less of streets in the school enrollment zone:
 - Physical Activity Product or Brand (Range: 0-5 % of streets had ads)
 - Physical Activity Service, Facility or Event (Range: 0-2 % of streets had ads)
 - Screen Entertainment (Range: 0-8 % of streets had ads)
 - Cell Phones (Range: 0-41 % of streets had ads)

Physical Activity Outcome Measures

- To what extent have you participated in the following school activities during this school year? Athletic teams (N=22,003, 53.1%).
- In which competitive sports (if any) did you participate during the LAST 12 MONTHS? Include school, community, and other organized sports. (Mark all that apply) (N=16,100, 64.9%).
- On how many days a week are you physically active for 60 or more minutes? (N=14,570, mean=62.2% 4 or more days a week)?

Sedentary Behavior Outcome Measures

- ❑ How many hours a day do you spend watching T.V. (separate questions for weekday vs. weekend)? (N=38,889, 37.9% 3 hours or more a day)
- ❑ About how many hours a week do you spend:
 - ✓ Playing electronic games on a computer, TV, phone, or other device?
 - ✓ Texting on a cell phone?
 - ✓ Talking on a cell phone?



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Results

Street Advertising and Adolescent Physical Activity – Preliminary Results – ¼ Mile Buffer

	School-based Sports Participation		Any Sports Participation		4 or More days/Wk of 60 min. PA	
	IRR	95% CI	IRR	95% CI	IRR	95% CI
PA Product/Brand	1.18	1.06, 1.31	1.06	1.02, 1.09	0.99	0.93, 1.06
PA Service/Facility/Event	0.98	0.94, 1.03	1.01	0.98, 1.03	0.98	0.97, 0.99
Screen Entertainment	0.99	0.97, 1.01	1.01	0.99, 1.02	0.99	0.97, 1.01
Cell Phones	1.01	0.98, 1.05	0.99	0.98, 1.01	1.01	0.99, 1.03

All models controlled for parental education, community-level median household income, perceived neighborhood safety, community-level sprawl, region, race/ethnicity, grade, and gender.

Communitywide:

- ❑ Communities with a greater proportion of streets with cell phone ads were significantly positively associated with both school-based and any sports participation.
- ❑ Communities with a greater proportion of streets with screen entertainment ads were significantly negatively associated with school-based sports participation.

Slater, Quinn, et al., in development

Street Advertising and Adolescent Sedentary Behavior – Preliminary Results – ¼ Mile Buffer

	> 10Hr/Wk TV		>10Hr/Wk Gaming		>10Hr/Wk Texting		>10Hr/Wk Talking	
	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
PA Product/Brand	0.88	0.83, 0.93	0.05	0.03, 0.07	0.05	0.03, 0.07	0.06	0.03, 0.09
PA Service/Facility/Event	0.99	0.97, 1.01	0.96	0.92, 0.99	1.01	0.99, 1.03	0.99	0.97, 1.02
Screen Entertainment	1.01	0.97, 1.03	0.98	0.93, 1.02	0.98	0.94, 1.02	0.98	0.93, 1.02
Cell Phones	1.01	0.99, 1.02	1.03	1.004, 1.06	1.03	0.98, 1.07	1.03	0.92, 1.16

All models controlled for parental education, community-level median household income, perceived neighborhood safety, community-level sprawl, region, race/ethnicity, grade, and gender.

Communitywide:

- ❑ Communities with a greater proportion of streets with PA service/facility/event ads were significantly negatively associated with watching more than 2 hours of T.V. a day.
- ❑ There were no significant associations between community-wide street marketing and these sedentary behavior measures.

Slater, Quinn, et al., in development

Street Advertising and Prevalence of Obesity – Preliminary Results

- ❑ Increased density of PA product/brand ads in the ¼ mile surrounding schools was significantly associated with a 27% decrease in the prevalence of obesity (IRR 0.73, 95% CI 0.61, 0.86)
- ❑ Increased density of cell phone ads in the ¼ mile surrounding schools was significantly associated with a 5% increase in the prevalence of obesity (IRR 1.05, 95% CI 1.003, 1.10).
- ❑ There were no significant associations between community-wide street marketing and prevalence of obesity.



Conclusions

- Results suggest youth with greater exposure to positive physical activity-related ads near school was associated with increased physical activity and reduced sedentary behavior.
- Youth spend a significant amount of time at school, which suggests that they may be more sensitive to ads near school than those present in the community.
- Increasing the amount of positive PA advertising near schools and throughout communities may be an effective strategy to promote healthy living by influencing increased physical activity and reduced sedentary behavior.

Thank You!

For more information: www.bridgingthegapresearch.org

Contact Information:
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for our
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A screenshot of the Bridging the Gap website homepage. The header includes the logo "bridging the gap" and the tagline "Research Informing Policies and Practices for Healthy Youth". A navigation menu contains links for HOME, ABOUT US, RESEARCH, PRODUCTS, NEWS, QUICK FACTS, RELATED SITES, and CONTACT US. The main content area features a large orange banner with the text "Community Data" and "Assessing local policies and environments" over a background image of people on bicycles. Below this, there are sections for "Bridging the Gap" (describing the program's goal), "What We Do" (listing three bullet points), and "Sign Up to Receive News and Updates" (with a "Join the E-mail List" link). On the right side, there is a "Latest Research Product" section for an "Issue Brief" on "Sugary Drinks and Latino Kids" and a "Quick Facts" section with a "view archive" link. The footer includes the Robert Wood Johnson Foundation logo and a "Follow @BTGresearch" button.