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# Promoting Healthy Eating and Physical Activity

## Short-Term Effects of a Mass Media Campaign

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**Background:** Soaring obesity levels present a severe health risk in the United States, especially in low-income minority populations.

**Intervention:** High-frequency paid television and radio advertising, as well as bus and streetcar signage.

**Setting/  
participants:** A mass media campaign in New Orleans to promote walking and fruit and vegetable consumption in a low-income, predominantly African-American urban population. Messages tailored with consideration of the African-American majority.

**Design:** Random-digit-dial telephone surveys using cross-sectional representative samples at baseline in 2004 and following the onset of the campaign in 2005.

**Measures:** Survey items on campaign message recall; attitudes toward walking, snack food avoidance, and fruit and vegetable consumption; and behaviors related to fruit and vegetable consumption, snack food consumption, and utilitarian and leisure walking.

**Results:** From baseline, there were significant increases in message recall measures, positive attitudes toward fruit and vegetable consumption, and positive attitudes toward walking. Behaviors did not change significantly. In 2005, message recall measures were associated with positive levels of each of the outcome variables.

**Conclusions:** Over 5 months, the media campaign appeared to have stimulated improvements in attitudes toward healthy diet and walking behaviors addressed by the campaign. These findings encourage the continuation of the media campaign, with future evaluation to consider whether the behavioral measures change.

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### Introduction

Obesity prevalence among adults in the United States has risen dramatically, from under 15% in 1960–1962 to 30.5% in 1999–2000 to more than 32% in 2003–2004.<sup>1,2</sup> Obesity is especially common among African-American women.<sup>3</sup> It has been estimated that approximately 112,000 deaths are attributable to obesity annually.<sup>4</sup> Louisiana has rates of obesity and related disease mortality far above the national averages.<sup>5</sup> Among U.S. states in 2001, Louisiana had the second highest cancer mortality rate and the sixth highest cardiovascular disease mortality rate.<sup>6</sup>

As a result of these trends in obesity and the resulting adverse health outcomes, various calls to action have been made to address sedentary lifestyles and diets that are high in calories and fat.<sup>1–10</sup> Various types of com-

munication campaigns have attempted to alter attitudes and behaviors related to healthy diet and physical activity. In the United States, such campaigns have resulted in interventions via the workplace,<sup>11</sup> primary care facilities,<sup>12</sup> community partnerships,<sup>13</sup> counseling,<sup>14</sup> and elderly community dwellings.<sup>15</sup> Other campaigns in the United States have relied primarily on mass media components.<sup>16–19</sup> Although some media campaigns have targeted Hispanics with Spanish-language messages,<sup>20</sup> most related campaigns have not honed messages for specific audiences, such as African Americans. In addition, no related campaigns could be located that have relied on paid advertising with a high-frequency approach such as that of the current campaign.

The current study evaluates the first phase of a media campaign in New Orleans that attempted to promote a healthy diet and physical activity. The media campaign, Steps to a Healthier New Orleans (“Steps”), differed from previous campaigns in two important ways. First, the campaign targeted healthy diet and physical activity in a metropolitan area with an African-American majority, which is important because obesity and overweight prevalence are highest among African-American

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women.<sup>3</sup> Second, the campaign relied on paid advertising, which allowed for ad placement during times of high viewing and listening, and a high-frequency approach, which allowed for broader dissemination than most media campaigns.

## Methods

### Intervention

This media campaign was the product of a partnership between the Louisiana Public Health Institute and the City of New Orleans, with funding from the Centers for Disease Control and Prevention (CDC) and the Entergy Charitable Foundation. The campaign aimed at higher levels of physical activity and fruit and vegetable consumption, and a lower level of high-calorie snack food consumption. The first phase of the media campaign, which ran from the second week of February 2005 through August 2005, focused on only the first two of these goals. During this phase of the campaign, there were two television ads, four radio ads, 26 taillight bus signs, 20 large side-panel bus signs, two taillight streetcar signs, and two large side-panel streetcar signs. The ads and signs made specific recommendations about fruit and vegetable consumption and walking.

The ads and signs targeted adults in New Orleans, with a specific emphasis on African-American women aged 18 to 49 years. Two focus groups were held during the development of the media messages to determine specific recommendations and messages likely to be most effective. The focus groups consisted of African-American women, approximately half of whom were overweight. The focus groups indicated that, although cost was a factor in influencing fruit and vegetable consumption, time constraints appeared to be more important. In addition, because time constraints were a barrier to physical activity, it is important to incorporate physical activity into an existing daily routine instead of approaching it as a separate task.

The messages were refined with reference to the focus group findings and previous research demonstrating that media messages with a white or mainstream focus have a less beneficial influence on African-Americans than whites.<sup>21,22</sup> In contrast, messages with African-American characters and a mainstream social context are expected to be most effective because media effects on African Americans result primarily from racial cues, while media effects on whites result primarily from social cues,<sup>23</sup> such as personal appearance and socioeconomic status.<sup>24</sup> In light of these findings, Steps ads and signs had African-American characters with mainstream settings and mainstream styles of dress and conversation. For example, one television ad showed an African-American couple in their 30s. Sitting at a kitchen table, the man says that it is hard and time consuming to eat healthy foods. The woman provides him with a pre-cut bagged salad. Afterward, they happily eat the salad. The setting is common, language is straightforward, the accent is New Orleanian, and the message is clear. Eating healthy does not need to be laborious and time consuming.

Media time from February to August 2005 was purchased with special attention to African-American women aged 18 to 49 years. TV messages and radio messages were disseminated during the first 3 weeks and first 2 weeks of each month,

respectively. The intensity of the campaign was high. For African-American women aged 18 to 49 years, weekly gross rating points (GRPs) ranged from 293 to 588 (mean 366.8) for television and from 0 to 171 (mean 70.2) for radio. One GRP indicates that 1% of the target audience viewed the ad one time. Thus, a GRP of 588 in 1 week would suggest that, on average, a person in the target audience viewed the ads more than five times in that week. The campaign's GRPs were higher than most other health media campaigns. For example, the "Truth" campaign had average weekly television GRPs that ranged by state between 6.2 and 215.2.<sup>25</sup> In New York State, the "BC Walks" campaign had total GRPs of 4835 for television and 3245 for radio,<sup>16</sup> as compared to 10,229 and 1966, respectively, for Steps.

### Study Design

The data-collection instruments came from the 2004 and 2005 versions of the Behavioral Risk Factor Surveillance System (BRFSS) survey designed by the CDC, with locally added questions specifically addressing the media campaign and its intended effects. Random-digit telephone dialing was used. Interviews were conducted with adults (aged  $\geq 18$  years) in the New Orleans area who were randomly selected among household members. The 2004 surveys, which served as the baseline, were conducted from April 21 2004 to November 24, 2004 ( $n=3137$ ). The 2005 surveys were conducted during the campaign from February 25, 2005 to July 22, 2005 ( $n=1500$ ). The campaign and evaluation preceded Hurricane Katrina.

There are several standard ways of calculating response rates for telephone surveys.<sup>26</sup> A minimum, or most stringent, response rate involves division of the number of complete interviews by the sum of the following: complete interviews, partial interviews, refusals and break-offs, noncontacts, other noncontacts, and unknowns. Per this formula, the response rate was 26.6% in 2004 and 20.4% in 2005. A more telling measure, given the audience sampled, may be the household refusal rate, which was 8.2% in 2004 and 8.6% in 2005. These rates are similar to those of other telephone surveys in Louisiana using similar methodologies.

### Measures

Demographics, which were implemented as control variables, included age, gender, ethnicity, education, and household income. Income was measured on an 8-point scale, from  $< \$10,000$  to  $\geq \$75,000$ . Education was measured on a 6-point scale, from "never attended or only attended kindergarten" to "four years or more of college." A dummy variable was created for African American. Descriptive statistics appear in Table 1.

There were three measures of media campaign recall. The first measure, fruit and vegetable message recall, was assessed with two items related to broadcast ads encouraging fruit and vegetable consumption and bus and streetcar signs encouraging fruit and vegetable consumption. The second measure, walking message recall, was assessed with two items related to broadcast ads encouraging walking and bus and streetcar signs encouraging walking. These two recall measures had general items that assessed recall of all related media messages, including those not specific to Steps. The third measure, brand recall, was assessed with two items related to the

**Table 1.** Descriptive statistics of telephone survey sample

	2004	2005
<b>Sample (n)</b>	3137	1500
	<i>n (%)</i>	<i>n (%)</i>
<b>Age, mean years±SD</b>	49.6±17.5	50.0±17.4
18–49	1545 (49.3)	729 (48.6)
≥50	1592 (50.8)	771 (51.4)
<b>Gender</b>		
Female	2033 (67.1)	1014 (67.6)
<b>Education</b>		
Less than high school	382 (12.1)	175 (11.7)
High school graduate	841 (26.8)	400 (26.7)
Attended college	1897 (60.5)	916 (61.1)
<b>Ethnicity</b>		
White	1105 (35.2)	532 (35.5)
African American	1867 (59.5)	879 (58.6)
<b>Income</b>		
<\$25,000	1174 (37.4)	539 (35.9)
\$25,000–<\$50,000	743 (23.7)	370 (24.7)
\$50,000–<\$75,000	278 (8.9)	129 (8.6)
≥\$75,000	387 (12.3)	199 (13.3)

media campaign's name (Steps) and trademark phrase ("Treat You Right").

Attitudinal measures were specific to fruit and vegetable consumption, avoidance of high-calorie snack foods, and walking. Perceived importance of these activities was measured, with responses as follows: not at all important, 1; not too important, 2; somewhat important, 3; and very important, 4.

Behavioral measures included servings of fruit and vegetables consumed, servings of snack food consumed, leisure walking, and utilitarian walking. Servings of fruit and vegetables consumed had items specific to the consumption of fruit, fruit juice, green salad, carrots, potatoes (excluding French fries, fried potatoes, and potato chips), and other vegetables. Servings of snack food consumed was assessed with two items: consumption of carbonated soft drinks and consumption of snacks such as chips, cookies, doughnuts, and candy. Leisure walking involved walking outdoors "for at least 10 minutes just for exercise or pleasure, including walking with a dog." Utilitarian walking involved walking "to work or school, to a store or to do an errand, to the bus, or to a neighbor's house for a walk that takes at least 10 minutes." This second measure excluded walking for exercise or pleasure and walking a dog.

A time index was created for this analysis, with the baseline data coded 0 and the 2005 data coded in monthly increments from 1 to 6.

### Statistical Procedure

Trends in the attitudinal, behavioral, and message recall measures were assessed with hierarchical regression analysis. Demographics were entered in the first step, with time in the second step. Relationships between message recall and the attitudinal and behavioral measures during 2005 were assessed with hierarchical regression analysis. Demographics were entered in the first step, with message recall measures in the second step. To test whether these associations varied between the campaign's most specific focal audience (African-American women aged 18 to 49 years) and others, interaction terms were used.<sup>27</sup> To decrease multicollinearity between the

product terms and their independent variable components, the independent variables and their product terms were standardized.<sup>28</sup> To test the moderation of associations between the outcome variables and time, three steps were used: (1) education and income, (2) focal audience and time, and (3) focal audience × time. To test the moderation of the associations between the outcome and recall variables, three steps were used: (1) education and income, (2) focal audience, brand recall, walking message recall, and fruit and vegetable message recall, and (3) focal audience × brand recall, focal audience × walking message recall, and focal audience × fruit and vegetable message recall. Analysis of the data occurred in 2006.

### Results

Table 1 shows the descriptive statistics of demographics for the baseline period and during the campaign in 2005. Respondents had a mean age of about 50 years, with about two thirds female and just under 60% African American. More than a third had household incomes <\$25,000 per year. In comparison to the New Orleans population at the time of the telephone survey interviews, the current sample was more likely to be female (67%, as compared to 53%), white (35%, as compared to 29%), and educated (with 87% having a high school degree, as compared to 75%).<sup>29</sup> The mean body mass index was 27.4 (standard deviation [SD]=6.4) in 2004 and 27.3 (SD=6.1) in 2005.

Table 2 offers a summary of media and outcome variables for the total sample and subsamples in 2004 and 2005. For example, the percent of respondents who considered walking to be very important increased from 2004 to 2005 for all respondents (73% to 76%), as well as for African-American women aged 18 to 49 years (75% to 78%) and for others (72% to 76%). This table offers a conservative comparison, as the percents for 2005 increased by month during the campaign. To assess the possibility that seasonality could influence the outcome variables, analysis of variance was conducted to test between-month differences in outcome variables in 2004. There was very little support for such differences (analysis not shown).

Table 3 depicts findings related to whether campaign recall varied by time. Step 2 shows significant increases in brand recall ( $\beta=0.41$ ,  $p<0.001$ ), fruit and vegetable message recall ( $\beta=0.04$ ,  $p<0.05$ ), and walking message recall ( $\beta=0.05$ ,  $p<0.01$ ). For example, recall of Steps increased from 2.1% in 2004 to 23.2% in 2005, and recall of the trademark phrase "Treat You Right" increased from 2.2% in 2004 to 25.3% in 2005. In addition, African Americans had higher levels of brand recall ( $\beta=0.10$ ,  $p<0.001$ ), fruit and vegetable message recall ( $\beta=0.19$ ,  $p<0.001$ ), and walking message recall ( $\beta=0.22$ ,  $p<0.001$ ). For example, in 2005, 28.7% of African Americans recalled Steps, as compared to

**Table 2.** Measures of attitudes and behaviors for total sample, African-American women aged 18–49, and others, 2004 and 2005

	Total sample (%)		African-American women aged 18–49 (%)		Others (%)	
	2004	2005	2004	2005	2004	2005
Consider walking to be very important	73	76	75	78	72	76
Consider fruit and vegetable consumption to be very important	79	84	79	82	78	84
Consider calorie avoidance to be very important	63	63	64	63	62	65
Consumed three or more servings of fruit and vegetables per day	33	33	30	30	34	33
Consumed three or more servings of snack foods per day	10	11	11	12	9	9
Participate in leisure walking in a usual week	64	67	68	70	63	66
Participate in utilitarian walking in a usual week	51	50	58	55	49	49
Recall walking messages <sup>a</sup>	47	52	57	62	35	38
Recall fruit and vegetable messages <sup>a</sup>	46	52	57	61	43	49
Recall brand	4	36	4	44	3	23

<sup>a</sup>Messages not specific to the campaign.

15.5% of others. Similarly, in 2005, 33.8% of African Americans recalled “Treat You Right,” as compared to 13.2% of others.

Table 4 depicts findings related to whether the outcome variables changed over time. Step 2 shows significant improvements in attitudes toward fruit and vegetable consumption ( $\beta=0.07$ ,  $p<0.001$ ) and attitudes toward walking ( $\beta=0.04$ ,  $p<0.01$ ). The other measures remained constant. African Americans had more positive attitudes toward fruit and vegetable consumption ( $\beta=0.04$ ,  $p<0.05$ ) and toward walking ( $\beta=0.06$ ,  $p<0.01$ ), but less positive attitudes toward leisure walking ( $\beta=-0.04$ ,  $p<0.05$ ).

Table 5 illustrates the relationships between campaign recall and the outcome measures during the campaign in 2005. As shown in Step 2, fruit and vegetable message recall significantly predicted each of the outcome measures: attitudes toward fruit and vegetable consumption ( $\beta=0.08$ ,  $p<0.05$ ), fruit and vegetable consumption ( $\beta=0.11$ ,  $p<0.01$ ), attitudes toward calorie avoidance ( $\beta=0.07$ ,  $p<0.05$ ), snack food consumption ( $\beta=-0.09$ ,  $p<0.05$ ), attitudes toward walking ( $\beta=0.09$ ,  $p<0.05$ ), leisure walking ( $\beta=0.08$ ,  $p<0.05$ ), and utilitarian walking ( $\beta=0.12$ ,  $p<0.001$ ). Walking message recall ( $\beta=0.13$ ,  $p<0.001$ ) and brand recall ( $\beta=-0.07$ ,  $p<0.05$ ) both predicted attitudes toward walking. In an analysis using interaction terms, neither the relationships between time and outcome measures, nor the relationships between campaign recall and outcome measures, varied between the campaign’s most specific focal audience (African-American women aged 18 to 49 years) and other respondents (not shown).

## Discussion

To assess the effectiveness of the media campaign, two main steps were taken. First, there was an assessment of improvements over time in the indicators of healthy diet and physical activity. Second, there was an assessment of positive associations between message recall and indicators of healthy diet and physical activity during the campaign. In the short term, improvements in the attitudinal measures were expected, with change in behavioral measures likely requiring more time and greater message dissemination.

The current study offers strong support for these two associations in terms of the attitudinal measures. Attitudes toward fruit and vegetable consumption im-

**Table 3.** Impact of demographics and time on campaign recall measures, 2004 and 2005

	Brand recall	Fruit and vegetable message recall	Walking message recall
<b>Step 1</b>			
Age	<b>-0.07***</b>	<b>0.08***</b>	<b>0.08***</b>
Gender (M=1)	<b>-0.03*</b>	-0.02	-0.01
Education	0.01	-0.03	<b>-0.05**</b>
Income	-0.03	<b>-0.12***</b>	<b>-0.08***</b>
African American	<b>0.10***</b>	<b>0.19***</b>	<b>0.22***</b>
R <sup>2</sup>	<b>0.02***</b>	<b>0.08***</b>	<b>0.09***</b>
<b>Step 2</b>			
Time	<b>0.41***</b>	<b>0.04*</b>	<b>0.05**</b>
$\Delta R^2$	<b>0.15***</b>	<b>0.00*</b>	<b>0.00**</b>

Coefficients are standardized.

\* $p<0.05$ ; \*\* $p<0.01$ ; \*\*\* $p<0.001$  (all bolded).

**Table 4.** Impact of demographics and time on attitudes and behaviors, 2004 and 2005

	Attitudes toward fruit and vegetable consumption	Fruit and vegetable consumption	Attitudes toward calorie avoidance	Snack food consumption	Attitudes toward walking	Leisure walking	Utilitarian walking
<b>Step 1</b>							
Age	<b>0.07***</b>	<b>0.07***</b>	<b>0.10***</b>	<b>0.07***</b>	0.00	<b>-0.09*</b>	<b>-0.18***</b>
Gender (M=1)	<b>-0.12***</b>	<b>-0.05*</b>	<b>-0.13***</b>	<b>-0.05*</b>	<b>-0.07***</b>	<b>0.04**</b>	<b>0.07***</b>
Education	<b>0.10***</b>	0.04	0.04	0.04	<b>0.05*</b>	<b>-0.06</b>	<b>-0.04*</b>
Income	0.03	0.03	<b>0.05*</b>	0.03	0.02	0.00	<b>-0.18***</b>
African American	<b>0.04*</b>	0.00	0.02	0.00	<b>0.06**</b>	<b>-0.04*</b>	-0.03
R <sup>2</sup>	<b>0.03***</b>	<b>0.01***</b>	<b>0.03***</b>	<b>0.01***</b>	<b>0.01***</b>	<b>0.01***</b>	<b>0.06***</b>
<b>Step 2</b>							
Time	<b>0.07***</b>	-0.01	0.01	-0.01	<b>0.04**</b>	0.01	-0.03
ΔR <sup>2</sup>	<b>0.01***</b>	0.00	0.00	0.00	<b>0.00**</b>	0.00	0.00

Coefficients are standardized.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (all bolded).

proved over time, in association with an increase in fruit and vegetable message recall. Similarly, attitudes toward walking improved over time, in association with parallel increases in walking message recall and fruit and vegetable message recall. These improvements are especially impressive when considering that the two attitudinal measures were nearing the ceilings of their respective scales. These findings suggest a media effects model in which the dissemination of the media campaign messages led to improvements in people's attitudes related to healthy diet and physical activity.

In contrast, attitudes toward avoiding snack foods did not change over time. This result is not surprising because none of the campaign ads or signs in this first phase of the campaign made specific recommendations about avoiding high-calorie snack foods. This finding suggests that healthy diet and walking messages will not lead to changes in outcome measures specific to calorie avoidance. This argues against general messages recom-

mending "a healthy diet" or "a balanced diet," and in favor of messages that specifically advocate the avoidance of calorie-dense snack foods.

The findings related to behaviors are less clear. The four behavioral outcomes, although positively associated with the campaign recall measures in 2005, remained constant over time. These findings suggest a selective exposure model,<sup>30</sup> in which people who have healthier diets and walk more often may be more likely to attend to and recall related campaign messages.

While there appears to be support for a positive influence of the media campaign on attitudes, the influence on behavior, which is the ultimate goal of the campaign, is unresolved. This status does not indicate that the campaign will not be successful, as behaviors take more time to change than attitudes.<sup>31</sup> The possibility that behavior change could result in the future is supported by the hierarchy-of-effects model,<sup>32,33</sup> which suggests that message awareness will influence attitudes, which, in turn,

**Table 5.** Impact of demographics and campaign recall on attitudes and behaviors during campaign, 2005

	Attitudes toward fruit and vegetable consumption	Fruit and vegetable consumption	Attitudes toward calorie avoidance	Snack food consumption	Attitudes toward walking	Leisure walking	Utilitarian walking
<b>Step 1</b>							
Age	0.05	0.06	0.03	<b>-0.16***</b>	-0.03	-0.05	<b>-0.17***</b>
Gender (M=1)	<b>-0.08**</b>	-0.03	<b>-0.11***</b>	-0.01	-0.02	0.06	<b>0.08*</b>
Education	<b>0.12***</b>	0.08*	0.02	-0.05	0.06	-0.01	0.00
Income	0.02	<b>0.07*</b>	0.05	0.04	0.07	-0.03	<b>-0.21***</b>
African American	0.00	0.04	0.00	0.06	0.06	-0.06	0.00
R <sup>2</sup>	<b>0.02***</b>	<b>0.02**</b>	<b>0.01**</b>	<b>0.03***</b>	<b>0.01*</b>	0.01	<b>0.07***</b>
<b>Step 2</b>							
Walking message recall	0.03	-0.01	-0.03	0.05	<b>0.13***</b>	-0.01	0.03
Fruit and vegetable message recall	<b>0.08*</b>	<b>0.11**</b>	<b>0.07*</b>	<b>-0.09*</b>	<b>0.09*</b>	0.08	0.12
Brand recall	-0.04	0.06	0.05	0.03	<b>-0.07*</b>	0.01	0.02
ΔR <sup>2</sup>	<b>0.01*</b>	<b>0.02***</b>	<b>0.01*</b>	0.01	<b>0.03***</b>	0.01	<b>0.02***</b>

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (all bolded).

will influence behaviors. Thus, it would be expected that the influence of Steps on attitudes may lead to changes in behaviors over time. Such a progression from attitudes to behaviors would be aided by the sustenance and enhancement of the media campaign. The public health benefit is minimal in terms of the goal of influencing healthy diet and physical activity behaviors, but could be greater in the future when considering attitudinal change as a step toward behavioral change.

While most campaigns would expect greater effects on the most specific focal audience, the undifferentiated findings in the current study should not be a surprise for two reasons. First, the media messages were disseminated in a manner that, while primarily targeting African-American women aged 18 to 49, also exposed others. Second, the messages had mainstream social contexts, which, research has suggested,<sup>23</sup> would be an effective means of influencing white audience members. Because African Americans are typically less responsive to mainstream-oriented media messages,<sup>21,22</sup> the fact that they responded in similar fashion to whites and other non-African Americans is encouraging, offering support for the effectiveness of the message-targeting approach implemented in this media campaign. In addition, the findings here indicate that the campaign's primary focus on an African-American audience does not detract from its effects on others.

The current study has two important limitations. First, although causation is implied in the analyses conducted here, it cannot be conclusively demonstrated because we used only serial cross-sectional data without an unexposed control population. Second, the findings of this study should be applied only with caution to other media campaigns and populations.

Getting past attitudinal change to behavioral change has not proven easy. Although early research indicated that the influence of media campaigns related to healthy diet and physical activity was limited to awareness and attitudes,<sup>34</sup> some recent research has indicated modest effects on related behaviors.<sup>35</sup> For example, two foreign campaigns led to improvements in diet,<sup>19,36</sup> and BC Walks<sup>16</sup> and Wheeling Walks<sup>37</sup> led to increased walking behavior. In contrast, in terms of physical activity, a media campaign in Scotland<sup>38</sup> and another in Australia<sup>39</sup> influenced awareness, knowledge, and beliefs, but not behavior.

The findings are encouraging for an early evaluation of this campaign, especially in light of the troubling health status of African Americans and other residents of New Orleans. Future research should continue to monitor the campaign's impact, as well as the impact of other campaigns with similar objectives and message-targeting approaches. Specialists who administer such media campaigns should pay heed to two practical lessons. First, when targeting multiracial populations, ethnicity-biased effects, which have been demonstrated by previous research,<sup>21,22</sup> can be addressed with ads

that have African-American characters and mainstream social contexts. Second, when aiming to alter attitudes and behaviors related to the consumption of high-calorie snack foods and carbonated soft drinks, recommendations specific to snack foods and soft drinks should be made. Although the current media campaign did not make these recommendations specific to snack foods and soft drinks, such recommendations have been infused into the subsequent phase of the campaign.

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