

**Evaluation of a Targeted Social Marketing Campaign Promoting Nutrition
and Physical Activity to SNAP-Ed Eligible Adults in Alabama**

by

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Abstract

Obesity and its comorbidities disproportionately affect individuals with limited resources, minority populations, and those in the Southeastern United States (Warren, Beck, & Delgado, 2020). Adults with limited resources face many barriers to obtaining health education and changing behaviors including limited money, time, childcare, transportation, and access. Therefore, a variety of approaches at the individual and societal levels is necessary to reduce and prevent obesity.

The role of social marketing in obesity prevention is to understand the individual and environmental barriers to behavior change and to provide targeted educational messages within multi-component interventions to audiences most in need of behavioral support. The Live Well Alabama campaign utilized numerous evidence-based methods for building brand awareness and disseminating messages to parents of elementary-aged children with limited resources. The largest component of the campaign was a 12-week, statewide billboard campaign comprised of three messages promoting 1) fruit and vegetable consumption, 2) physical activity, and 3) water consumption. The purpose of this study was to examine the relationship between exposure to this social marketing campaign and nutrition and physical activity behaviors among its target audience.

Of the 366 respondents, a slight majority (50.5%) reported seeing at least one billboard during the outdoor advertising campaign. When compared to respondents who were not exposed to campaign messages, exposed respondents generally reported better health, increased readiness to change behavior, and greater integration of target behaviors into daily life. Specifically, exposed respondents reported significantly higher fruit and water consumption. Exposed

respondents also were significantly more likely to be in action or maintenance stages for fruit consumption and physical activity than their unexposed counterparts.

The most commonly reported barriers to fruit and vegetable consumption and physical activity were being too busy, not liking or already eating enough fruits and vegetables, the expense of fruits and vegetables, and poor physical health. Despite these barriers, the majority of respondents were in the preparation stage or higher for changing fruit and vegetable consumption and physical activity behaviors, indicating a general awareness of a need for change and an openness to education and support. In addition to findings related to exposure and behavior, respondents self-reported behavior change in response to campaign messages. This evaluation of the Live Well Alabama social marketing campaign yielded promising insights into the reach and potential effects among the target population, which warrants continued campaign implementation and evaluation.

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List of Abbreviations

ACES	Alabama Cooperative Extension System
BMI	Body Mass Index
BQ	Body Quest
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
DGA	Dietary Guidelines for Americans
FV	fruits and vegetables
LWA	Live Well Alabama
PA	physical activity
PSE	policy, systems, and environmental
SEM	Social Ecological Model
SES	socioeconomic status
SNAP	Supplemental Nutrition Assistance Program
SNAP-Ed	Supplemental Nutrition Assistance Program – Education
SSB	sugar-sweetened beverages
SOC	Stages of Change
TTM	Transtheoretical Model
USDA	United States Department of Agriculture

Chapter 1

Introduction

Overweight and obesity rates have increased to historic levels in recent decades (Hales, Carroll, Fryar, & Ogden, 2017). More than two-thirds of American adults are overweight or have obesity, and many have related health issues with serious long-term health implications. Additionally, 19.3% of U.S. youth ages 2-19 have obesity (Warren et al., 2020). Obesity is associated with increased risk for development of many chronic conditions such as Type 2 diabetes, cardiovascular disease, stroke, and certain cancers. Due to the severity of negative outcomes associated with obesity, prevention and reduction have become national public health priorities (Khan et al., 2009).

As obesity rates have risen, differences among racial, ethnic, and socioeconomic disparities have persisted over time. Obesity rates are higher among individuals who are Black/African American or Latino than among those who are White or Asian. Furthermore, adults and children from households with lower incomes and education levels experience greater prevalence of obesity than those of a higher socioeconomic status (SES) (Warren et al., 2020).

In addition to these disparities, geographical variation in obesity is apparent. The Southeastern states have experienced a greater prevalence than other parts of the United States (Centers for Disease Control and Prevention, 2009). Alabama consistently ranks among states with the highest prevalence of youth and adult obesity in the nation. More than one-third (36.1%) of Alabama adults and 16.1% of children ages 10-17 have obesity (Warren et al., 2020).

The causes of obesity are a complex mixture of genetic, metabolic, cultural, social, environmental, and behavioral factors (National Institutes of Health, 1998). Though many of these factors are beyond an individual's control, certain modifiable personal diet and lifestyle

behaviors contribute to obesity. Specifically, low fruit and vegetable (FV) consumption (Centers for Disease Control and Prevention, 2018), limited physical activity (PA) (Warren et al., 2020), and excessive sugar-sweetened beverage (SSB) consumption (Vartanian, Scwartz, & Brownell, 2007) are common habits among Americans that are associated with obesity and chronic disease.

Similar to obesity, prevalence of these negative health behaviors are higher among Alabamians compared to other Americans. According to data from the 2015 Behavioral Risk Factor Surveillance System (BRFSS), Alabama ranked among the lowest in the country for the percentage of adults meeting daily recommendations for FV intake set by the Dietary Guidelines for Americans (DGA) (Lee-Kwan, Moore, Blanck, Harris, & Galuska, 2017). Also apparent from BRFSS data is the low level of PA among Alabamians, with nearly one in three (31.5%) adults living a sedentary lifestyle (Warren et al., 2020). While no data is available for SSB consumption in Alabama, available data from other southeastern states shows that SSB consumption is higher in this region than in other parts of the country, as well as among minorities and individuals of lower SES (Sohyun, Fang, Town, & Blanck, 2016).

Increasingly, experts recognize that traditional educational interventions alone are not comprehensive or accessible enough to combat the rise of obesity. The national State of Obesity report recently recommended public and private organizations working to prevent obesity employ a variety of approaches to address both individual and systemic causes of obesity while focusing efforts on disproportionately affected groups (Warren et al., 2020). One such effort is the Supplemental Nutrition Assistance Program-Education (SNAP-Ed) grant. This grant provides federal dollars through the Food and Nutrition Services branch of the United States Department of Agriculture (USDA) to each state for obesity prevention initiatives targeted to individuals and families at or below 185% of the federal poverty level. The national mission of SNAP-Ed is to

“improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current DGA and USDA food guidance” (U.S. Department of Agriculture, 2019, p. 5). The Alabama Cooperative Extension System (ACES) at Auburn University is a SNAP-Ed implementing agency and receives an annual grant to develop, implement, and evaluate evidence-based approaches to obesity prevention based on the Social Ecological Model (SEM).

The SEM provides a framework for developing multilevel interventions that address factors at individual, interpersonal, environmental, and cultural levels to influence the broader context in which people make choices about their physical health (Glanz & Rimer, 2005). SNAP-Ed initiatives align with the SEM by employing a combination of three approaches: 1) education on nutrition and PA, 2) policy, systems, and environmental (PSE) changes to increase access to nutritious foods and opportunities for PA, and 3) social marketing to reach the target audience with messages that promote healthy behaviors (U.S. Department of Agriculture, 2019). By using a combination of these three methods, SNAP-Ed interventions target multiple levels of the SEM.

Social marketing, the SNAP-Ed approach highlighted in this study, is “a process that applies marketing principles and techniques to create, communicate, and deliver value in order to influence target audience behaviors that benefit society (public health, safety, the environment, and communities) as well as the target audience” (Kotler & Lee, 2008, p. 7). Social marketing campaigns involve formative research to develop consumer-driven educational and promotional materials for a specific target audience. It works best when a specific target behavior is identified through formative research of the chosen population (Contento, 2007).

Evidence suggests that targeted, audience-tested social marketing interventions can effectively improve diet and increase PA among a variety of target audiences (Gordon, McDermott, Stead, & Angus, 2006). Furthermore, targeted social marketing to parents has improved elementary school children's diets due to the parental role of gatekeeper for nutrition in the home (Blitstein et al., 2016). This may indicate that targeting parents through social marketing may be a prudent use of resources with potential to influence both adult and youth outcomes related to obesity prevention.

Gregson and colleagues (2001) maintained that multilevel programs including social marketing should be informed by the SEM to improve program quality and accelerate necessary changes in public health. They also recommended assessing social marketing campaigns at the individual level of the SEM using the Transtheoretical Model (TTM), also known as Stages of Change (SOC), to identify individuals' stage of readiness to adopt target behaviors. They suggested measuring readiness as a behavioral antecedent to show early indication of program effectiveness when actual behavior change is difficult to measure.

In response to the need for obesity prevention efforts tailored for a resident audience of parents with limited resources, ACES SNAP-Ed at Auburn University developed an original, targeted, multi-component social marketing campaign. The campaign, named Live Well Alabama (LWA), included tailored messages delivered to the SNAP-Ed target audience through a variety of delivery channels, the largest of which were billboards. Messages and images for billboards were selected based on a state-level needs assessment, tested via focus groups with SNAP-Ed participants in local communities, and adapted based on participant feedback. All messages and materials reinforced and complemented the education and PSE strategies

employed by SNAP-Ed across Alabama as part of a comprehensive approach to obesity prevention consistent with the SEM.

Statement of the Problem

Obesity and chronic disease rates continue to rise among adults and youth, with disproportionate effects on individuals and families with limited resources, minority populations, and those in the Southeastern United States. A variety of approaches is necessary to reduce and prevent obesity, including education focused on nutrition and physical activity. However, adults with limited resources face many barriers to obtaining health education and applying lessons learned including limited money, time, childcare, transportation, and access. A more accessible form of communication is needed to reach this audience with educational information and positive messages to encourage healthy eating and being active. A targeted social marketing campaign could complement and extend existing education and PSE efforts to prevent obesity.

Social marketing has been used successfully to disseminate educational messages and influence a variety of behavior changes. Some of the most effective campaigns target a specific audience with tailored, positive, behaviorally focused messages (Fitzgibbon et al., 2007; Snyder, 2007). Robust campaigns employ a variety of social marketing principles and are informed by behavioral change theories, both with a societal focus, such as the SEM, and an individual focus, such as the TTM (Gregson et al., 2001). It is unknown how a targeted, theory-driven social marketing campaign promoting increased adoption of positive nutrition and physical activity behaviors may influence a population of SNAP-Ed eligible parents living in Alabama.

Purpose of the Study

The purpose of this study was to examine the relationship between exposure to a targeted social marketing campaign and the campaign's target nutrition and PA behaviors among SNAP-Ed eligible parents in Alabama. The LWA campaign utilized numerous methods for building brand awareness and disseminating messages to the target audience, including mass media (e.g. billboards), social media, text messaging, branded recipe cards with accompanying online videos, and signage in partnering organizations (e.g. parks, walking trails, grocery stores, farmers markets, schools). The evaluation conducted for this study primarily concerned the largest component of LWA, a 12-week, statewide billboard campaign comprised of three messages promoting 1) FV consumption, 2) PA, and 3) water consumption.

Significance of the Study

In the context of alarmingly high obesity rates and disproportionate effects on underserved populations including minorities, southeastern, and/or impoverished adults and youth, interventions to prevent obesity for the hardest-to-reach Americans are needed. Studies documenting effective methods for reaching target audiences facing the greatest health disparities can inform future efforts to reduce obesity in various vulnerable populations.

State SNAP-Ed implementing agencies are uniquely positioned to implement multi-level obesity prevention initiatives including social marketing techniques to spread consistent, tailored health messages to reach a specified target audience. Examples of successful methods related to development, implementation, and evaluation can benefit other agencies aiming to augment obesity prevention efforts with social marketing campaigns, which may help accomplish SNAP-Ed's mission of positively impacting individuals and communities at various levels of the SEM.

Research Questions

This study attempted to answer the following research questions:

- 1) To what extent are the brand and messages for the targeted social marketing campaign, LWA, recognized by SNAP-Ed eligible adults?
- 2) To what extent are there differences in exposure to campaign messages by demographic and other characteristics of the SNAP-Ed eligible adult survey respondents?
- 3) Was the use of a convenience sample of Body Quest (BQ) parent participants a confounding variable in this social marketing study?
- 4) What is the relationship between exposure to a targeted social marketing campaign and self-reported nutrition and PA behaviors of SNAP-Ed eligible adults?
- 5) What is the relationship between exposure to a targeted social marketing campaign and SOC related to FV consumption and PA among SNAP-Ed eligible adults?
- 6) What are the most commonly reported barriers to FV consumption and PA among SNAP-Ed eligible adults?

Assumptions

Assumptions that were made as part of this research include the following:

- 1) The sample was representative of Alabama parents of low SES.
- 2) Respondents answered survey questions honestly.

Limitations

This study had various limitations. First, participants in this study were limited to a non-randomized convenience sample of parents of elementary school-aged children with limited resources in Alabama. Therefore, results of this study should not be generalized beyond this

target audience. However, experts recommend careful selection of a target audience to ensure adequate exposure can be achieved (Hornik & Kelly, 2007). Because billboards were located in proximity to SNAP-Ed eligible elementary schools to target parents of low SES, this convenience sample was positioned to experience campaign exposure. The nature of a targeted social marketing campaign is such that results should be considered specific to the population under investigation. While results should not be widely generalized, methods can be replicated and insights from the target audience can be considered in interventions for similar audiences.

Second, this study relied on self-reported data, which may be susceptible to social desirability bias. The subject matter of behavioral questions may lead some respondents to provide answers they perceive to be more favorable to the researchers. In addition, self-reported exposure to campaign messages is difficult to collect reliably in a phone survey (Blitstein et al., 2016). With no images or logos provided, recall may have been limited for some participants, while other may have overstated their degree of exposure. Therefore, results must be interpreted with caution.

Finally, due to nonexperimental design and the nature of community-based interventions, researchers cannot be sure that any observed relationships between exposure and behavior were the sole result of the social marketing intervention. Because there were multiple opportunities for exposure to campaign materials beyond billboards, participants could not be randomized into true treatment and control groups prior to evaluation of the billboard campaign. This is a common limitation among applied research and program evaluation studies (Potter, 2012). Even though this study includes a comparison group that did not recall exposure to billboard messages, it cannot be known whether or not they were exposed to other health-related messages or interventions from another organization that may have impacted their responses.

Definitions

Selected definitions provided below may assist readers less familiar with social marketing and obesity prevention terminology and establish operational definitions for terms specific to this research.

- 1) Delivery or marketing channel – “any means through which persuasive messages are delivered” (Gregson et al., 2001, p. S8).
- 2) Exposure – seeing or hearing media campaign messages; usually assessed by some form of message recall (Hornik, 2002). The operational definition for this study is self-reported recall of seeing at least one of three billboard designs.
- 3) Impressions – “an estimate of how many opportunities there were for messages delivered through the mass media to be seen or heard...Not a measure of number of people reached” (Siegel & Doner, 2004, p. 507).
- 4) Obesity – A condition marked by excess body weight and identified by calculating Body Mass Index (BMI), which is weight (kilograms) divided by squared height (meters). “For adults, a BMI of 25.0 to 29.9 kg/m² is defined as overweight and a BMI of 30 kg/m² or higher is defined as obese. BMI is not used for children and adolescents age 2 to 18 years; instead, it is recommended that a percentile scale based on the child’s sex and age be used. In this population, overweight is defined as a BMI in the 85th to 94th percentile, and obesity is a BMI at or above the 95th percentile” (Apovian, 2016, p. S176).
- 5) SNAP-Ed eligible – individuals and families who qualify as the intended target audience for SNAP-Ed interventions; those living at or below 185% of the federal poverty level (U.S. Department of Agriculture, 2019).

Organization of the Study

Chapter 1 introduces the issue of obesity, its contributing factors, and the role of social marketing in obesity prevention efforts. Specifically, this study is described in terms of the problem, research questions, significance, assumptions, limitations, and definition of terms.

Chapter 2 provides a review of relevant literature, eventually narrowing the focus to documented effectiveness of social marketing practices to influence audiences with limited resources to improve personal health behaviors. Chapter 3 describes methods, followed by results in Chapter 4. Finally, Chapter 5 summarizes the conclusions and offers recommendations for future research.

Chapter 2

Literature Review

Introduction

This chapter provides a review of literature relevant to social marketing and the specific research questions presented in Chapter 1. The review begins by presenting the history and key tenets of social marketing and establishing its importance to public health. The importance of theory in social marketing design and evaluation is explored, and elements shown to contribute to the success of social marketing in public health and obesity prevention are discussed. Where applicable, the discussion is supported with findings from interventions focused on improving nutrition and PA behaviors among adults, with an emphasis on adults of low SES. Focus eventually is narrowed to interventions with a mass media component to provide insights for campaign design, implementation, and evaluation relevant to this study.

Purpose of the Study

The purpose of this study was to examine the relationship between exposure to a targeted social marketing campaign and the campaign's target nutrition and PA behaviors among SNAP-Ed eligible parents in Alabama. The LWA campaign utilized numerous methods for building brand awareness and disseminating messages to the target audience, including mass media (e.g. billboards), social media, text messaging, branded recipe cards with accompanying online videos, and signage in partnering organizations (e.g. parks, walking trails, grocery stores, farmers markets, schools). The evaluation conducted for this study primarily concerned the largest component of LWA, a 12-week, statewide billboard campaign comprised of three messages promoting 1) FV consumption, 2) PA, and 3) water consumption.

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- 3) Was the use of a convenience sample of BQ parent participants a confounding variable in this social marketing study?
- 4) What is the relationship between exposure to a targeted social marketing campaign and self-reported nutrition and PA behaviors of SNAP-Ed eligible adults?
- 5) What is the relationship between exposure to a targeted social marketing campaign and SOC related to FV consumption and PA among SNAP-Ed eligible adults?
- 6) What are the most commonly reported barriers to FV consumption and PA among SNAP-Ed eligible adults?

Overview of Social Marketing

Social marketing is “a process that applies marketing principles and techniques to create, communicate, and deliver value in order to influence target audience behaviors that benefit society (public health, safety, the environment, and communities) as well as the target audience” (Kotler & Lee, 2008, p. 7). Social marketers develop campaigns, or communications-centered interventions, which employ mass media and other strategies to influence attitudes and

behaviors. Campaigns use a variety of communication methods aimed at reaching a large, but specific group of people (Snyder, 2007). Social marketing tactics beyond mass communications can include creating environmental prompts or nudges toward desired behaviors, improving access to places and resources that make the desired behavior more convenient, and incorporating education into entertainment and social media (Kotler & Lee, 2011). Social marketing also can include the use of interpersonal communication, such as through a healthcare provider or educator, to support messages delivered via mass media and other marketing strategies (Evans, 2006). Social marketing uses a variety of traditional marketing principles to inform behaviorally focused interventions tailored to specific target populations.

Regardless of the methods used, the central tenet of social marketing is that activities are driven by the needs, desires, motivators, barriers, and realities of the consumer, or target audience member, rather than a sole reliance on the expertise of professionals (Lefebvre & Lurie, 1995). This consumer-centered approach was borrowed from commercial marketing and requires practitioners to first understand the viewpoints and motivations of the target audience before attempting to change their behavior (Hastings & McDermott, 2006). In a broader sense, social marketing can be considered a framework for designing interventions to encourage voluntary behavior change with a larger goal of positively influencing society. The social marketing framework is informed by several disciplines, including communications, psychology, sociology and anthropology (Gordon, McDermott, Stead, & Angus, 2006).

History of Social Marketing

The concept of using marketing techniques to influence people to adopt behaviors for their benefit originated in the 1950s by sociologist G.D. Wiebe when he famously asked the question, “Why can’t you sell brotherhood and rational thinking like you sell soap?” (Wiebe,

1951, p. 679). According to Wiebe (1951), successes of commercial marketing in influencing individual behavior hinged on certain opportunities and conveniences for the consumer already being in place. He suggested the same tactics could be successful in influencing social issues with individual behavior as their root cause.

As early practical applications of Weibe's theory took place in the 1960s promoting family planning, social marketing as an academic discipline continued development into the 1970's with seminal works contributed by Philip Kotler, Sidney Levy, and Gerald Zaltman. (Kotler & Levy, 1969; Kotler & Zaltman, 1971). During the 1980s and 1990s, social marketing was included in marketing textbooks and health communications resources. A scholarly journal, *Social Marketing Quarterly*, was founded in 1994. Subsequently, academicians organized annual social marketing conferences and several countries created national social marketing centers, including the United States, Canada, Australia, Scotland, and Poland (Andreasen, 2002).

Over time, the discipline migrated from its roots in commercial marketing, when early applications primarily promoted widespread adoption of specific products associated with social change (i.e. condoms and birth control), to a much broader application of marketing, communications, and educational principals to influence a vast array of individual behaviors and social change. Now seen as an integral component of public health initiatives, social marketing is routinely employed by U.S. governmental agencies, such as the Department of Agriculture and Centers for Disease Control and Prevention (CDC), and numerous non-governmental organizations (Andreasen, 2002).

Key Tenets of Social Marketing

Since its beginnings, social marketing researchers have relied on expertise from a plethora of subject matter (Carins & Rundle-Thiele, 2014). Because of this diversity, social

marketing interventions range in intensity and vary in program design. In the early 2000s, Alan Andreasen proposed six benchmark criteria, now considered foundational, as an attempt to bring cohesion to the field of social marketing (Andreasen, 2002).

Andreasen (2002) acknowledged that an intervention does not require all six criteria to be fully developed or strongly measured in order to be classified as social marketing, but simultaneously emphasized the importance of moving “beyond mere advertising that the power of the approach is manifested” (p. 7). The first of Andreasen’s six criteria was that social marketing interventions should focus on behavior change as the primary outcome. Second, practitioners should rely on consumer research to inform program design and delivery. Third, defining and segmenting the target audience will lead to greater reach and impact. Fourth, motivational exchanges help the audience find the behavior more attractive. In other words, if the audience is expected to quit or adopt certain behaviors, they will need to perceive some benefit of equal or greater value in return. Fifth, social marketers should include elements of the marketing mix, known as the Four Ps of marketing (product, price, place, and promotion) in campaign design. Lastly, the sixth criterion is the acknowledgement of the competing behavior the target audience is being encouraged to give up (Andreasen, 2002).

Building on Andreasen’s benchmark criteria, Thackeray and Brown (2005), expanded upon several terms to describe how components of traditional marketing fit within a social marketing context. They defined audience segmentation as the process of “dividing target populations into subgroups that share similar qualities or characteristics” (p. 366). Population segments are based on a combination of factors such as demographics, geographic location, attitudes, behaviors, personal values, readiness to change, or lifestyle. Segmentation is integral to social marketing and communications campaigns. It serves to narrowly define and understand

the target audience so resources can be used to develop messages and materials that will resonate with their beliefs, priorities, and values (Grier & Bryant, 2005).

Another key tenant of social marketing is consumer orientation. At all stages of intervention planning, implementation, and evaluation, the target audience is involved through formative or consumer research. Focus groups, interviews, and surveys help researchers understand the target audience and ensure campaign elements retain relevance and effectiveness over time (Thackeray & Brown, 2005).

Competition refers to the behaviors or associated benefits of the action the target audience prefers or is habitually doing instead of the behavior encouraged through the social marketing campaign. Competition also may refer to other organizations promoting or offering alternative messages, products, or behavioral options. A successful social marketing intervention will make the desired behavior appear to be the better choice compared to the competition. (Kotler, Roberto, & Lee, 2002; Thackeray & Brown, 2005).

Similarly, exchange theory, another concept borrowed from the marketing toolbox, is used in social marketing to offer the target audience some benefit in exchange for adopting the desired behavior that exceeds the perceived or actual cost (Thackeray & Brown, 2005). Social marketers should aim to understand the target audience's perceptions of costs and benefits of a particular behavior, and develop messaging and interventions to de-emphasize the costs and/or emphasize the benefits of the existing behavior and of the proposed behavior change (Wymer, 2011). For example, the costs of changing one's diet may include money, time required for meal planning and cooking, or limiting favorite foods. Benefits offered in exchange for these costs may include pride in taking positive action for one's health, becoming a better role model for children or family members, feeling better physically, and positive changes in body composition.

Debate Surrounding Benchmark Criteria

Despite widespread support for the usefulness and generally agreed upon principles of social marketing, variation in its application has resulted in considerable debate over which types of interventions should be classified as social marketing. This debate may stem from the fact that the social marketing discipline borrows elements from traditional health education, communications and marketing, and behavior change theory (Andreasen, 2002; Maibach, Abrams, & Marosits, 2007; Thackeray & Brown, 2005). On one hand, self-identifying social marketers have varied in their use of each of these elements within study designs, leading critics to question whether enough marketing elements were incorporated for the intervention to accurately be called social marketing (Quinn, Ellery, Thomas, & Marshall, 2010). On the other hand, many studies not originally described as social marketing by their authors later were classified as such by researchers conducting systematic reviews on social marketing interventions (Aceves-Martins et al., 2016; Luecking et al., 2017). Therefore, professionals on either side of the issue have maintained that there has been both an overuse and an underuse of the term social marketing in the literature to describe intervention activities.

A recent review of 34 diet-focused social marketing interventions found them to be generally effective, despite variation in use of the term social marketing and use of benchmark criteria. Specifically, about half of the interventions reviewed included a full marketing mix (the Four Ps) with intervention strategies beyond communications. The remaining half used some aspects of Andreasen's benchmark criteria, such as consumer testing messages and using focus groups to inform campaign development, but interventions were limited to communications and advertising efforts. Regardless of the variation among studies, the reviewers concluded that using

an approach rooted in principles of social marketing has been effective in changing dietary behaviors (Carins & Rundle-Thiele, 2014).

In contrast, Aceves-Martins and colleagues (2016) stressed the importance of aiming to include all benchmark criteria. They conducted a systematic review and meta-analysis of 32 distinct school-based obesity prevention interventions to assess use of the social marketing framework and benchmark criteria. They determined that studies employing higher numbers of benchmark criteria displayed a more informed methodological process and resulted in positive outcomes more often. Based on these findings, authors suggested that the key to conducting a successful social marketing intervention lies in using as many social marketing benchmark criteria in the study design as possible.

However, a more recent systematic review of obesity prevention interventions conducted through early child care centers examined 77 distinct interventions for inclusion of social marketing benchmark criteria and found that the number of benchmark criteria employed did not significantly increase effectiveness of interventions on improving children's diets, PA levels, or body compositions (Luecking et al., 2017). However, they detected a trend showing the likelihood of PA interventions having positive effects increased as more benchmark criteria were used. The authors concluded that individual study limitations and inconsistencies across studies made it impossible to recommend certain benchmark criteria over others. They instead reminded researchers that the value of social marketing benchmark criteria is their ability to build upon each other and work together as an integrated system.

Although there has been discipline-wide debate over the importance of each benchmark criterion, proponents of social marketing in public health and obesity prevention have agreed it is not only helpful, but necessary for achieving public health goals faster and on a larger scale

(Thackeray & Brown, 2005; Young, Anderson, Beckstrom, Bellows, & Johnson, 2004). When public health initiatives rely on in-person educational activities and prevention efforts, resources quickly expire. Social marketing allows for reaching exponentially more individuals through the utilization of a variety of media and intervention delivery channels. Audiences repeatedly see and hear messages and interact with delivery channels in their natural environments, which offers a less structured format than traditional face-to-face classes (Potter, 2012).

Although there is no universally accepted framework for social marketing, most proposed models share common principles. All proposed definitions and models for social marketing place high importance on continuous inclusion and consideration of the target audience in planning, implementation, and evaluation. Most also emphasize the importance of considering the marketing mix, or the Four Ps, in planning and development (Thackeray & Brown, 2005). Finally, experts agree that marketing efforts should encompass more than media activity and should include a variety of complementary approaches to promote behavior change (Hastings & McDermott, 2006).

Theory-based Social Marketing

In 2006, French and Blair-Stevens expanded upon Andreasen's seminal work by proposing that social marketing campaigns be theory-based. While acknowledging the marketing mix and other benchmark criteria as defining tenets of social marketing, they argued that something more was needed to successfully create behavior change. They asserted that interventions should be developed with a clear theoretical foundation to inform implementation and evaluation. (French & Blair-Stevens, 2006).

It has since been considered a best practice in social marketing to build interventions that meet social marketing benchmark criteria and are driven by a behavior theory to ensure

determinants of individual behaviors are considered in program design. While the importance of theory is recognized in the field, a 2013 review of theory use in social marketing found many published interventions to lack a theory base. Authors expressed a call to action for social marketers to use theory to guide planning and evaluation in the future (Luca & Suggs, 2013).

Despite the underutilization of behavior theory noted in the field, numerous social marketers have borrowed from theories of personal behavior change. Popular theories in social marketing literature include the Health Belief Model (Rosenstock, 1988), Diffusion of Innovations (Rogers, 2003), Theory of Planned Behavior (Ajzen, 1991), and Social Cognitive Theory (Bandura, 1986). A review conducted by Luca and Suggs (2013) found that the most common behavioral theory used to guide social marketing interventions has been the Transtheoretical Model (TTM) (Prochaska & DiClemente, 1983).

Transtheoretical Model

Prochaska and DiClemente (1983) developed the TTM for understanding individual behavior change as part of a study of cigarette smokers attempting to quit. The TTM classifies individuals into distinct stages of changing personal behavior. Their work has been widely used and applied to many behavioral interventions, including nutrition and PA interventions and social marketing.

The first stage along the continuum originally proposed by Prochaska and DiClemente is precontemplation. In this stage, a person generally does not think about or process much information related to changing the behavior in question. In fact, they may be defensive against the idea of a necessary change. In contrast, individuals in the contemplation stage understand the risks of their behavior and the benefits of changing. Contemplators admit a problem exists, seriously consider change, and actively seek information and resources to help change their

behavior. At some point, a person moves from contemplation to action. In this stage, individuals commit to changing a behavior and put certain self-control, environmental adaptation, and reinforcement practices in place to attempt behavior modification. People in the maintenance stage still actively pursue continuation of the achieved behavior change, attempting to avoid falling into relapse (Prochaska & DiClemente, 1983).

Almost a decade after this seminal work was published, Prochaska, DiClemente, and Norcross (1992) updated their model in light of years of research. They introduced a *preparation* stage to the model. This stage falls between contemplation and action and, by the authors own admission, was originally overlooked in earlier studies. Individuals in the preparation stage, present with both contemplation and action characteristics, and generally report expecting change in the immediate future. Another addition was the concept of change as a spiral pattern. Originally presented as a linear progression, the stages were amended to take on a spiral pattern, in which individuals often relapsed to earlier stages throughout the change process and recycled through stages they had already traversed. Prochaska and colleagues observed that after several spirals through various stages, some individuals eventually reach a termination stage, in which no temptation to relapse exists (Prochaska et al., 1992; Prochaska, Redding, & Evers, 2015).

The TTM has been used to assess readiness to change health-related behaviors, specifically FV consumption. For example, Feldman et al. (2000) analyzed the effects of the Maryland Women, Infants, and Children (WIC) 5-A-Day campaign, which promoted FV consumption among mothers with low SES, using the TTM to compare treatment and control groups in terms of movement through different SOC. The intervention included nutrition education sessions, print materials and reusable objects to serve as visual reminders, and materials sent through direct mail. Researchers used an SOC algorithm, consisting of

questionnaire items and instructions for stage assignment. The three questionnaire items used to stage participants were:

1. How many servings of fruits and vegetables (including 100% juice) are you eating a day?
2. For about how long have you been eating this number of servings of fruits and vegetables a day? (less than 1 month, 1 to 3 months, 4 to 5 months, or 6 months or longer)
3. Are you thinking about, planning to eat, or already eating more fruits and vegetables?
(Feldman et al., 2000, p. 655).

Participants were categorized as follows into one of five stages for FV consumption depending on their answers:

1. Precontemplation: Currently eating less than 5 servings a day (question 1) and not thinking about eating more fruits and vegetables
2. Contemplation: Currently eating less than 5 servings a day and thinking about starting to eat more fruits and vegetables in the next 6 months
3. Preparation: Currently eating less than 5 servings a day and definitely planning to start eating more fruits and vegetables in the next month
4. Action: Eating less than 5 servings a day, already eating more (question 3) and doing it for less than 6 months or eating 5 or more and doing it for less than 6 months
5. Maintenance: Eating less than 5 servings a day, already eating more (question 3), and doing it for more than 6 months *or* eating 5 or more and doing it for 6 months
(Feldman et al., 2000, p. 655).

Responses from treatment and control groups were compared over time and movement to stages that indicated greater readiness to change was observed as a result of the 5-A-Day intervention. Researchers also observed relationships between positive stage movement and improvement in various psychosocial factors related to FV consumption, such as self-efficacy, perceived barriers, and knowledge (Feldman et al., 2000).

Following the publication of studies using this staging algorithm by Feldman et al. (2000) and Campbell et al. (1999), Townsend and Kaiser (2005) built upon their work by developing a questionnaire specifically for adults with low SES. The Fruit and Vegetable Inventory tool was validated for use in federal programs, including SNAP-Ed, which serve low-income, minority populations, to measure FV consumption and psychosocial factors in relation to the TTM. Similar to the 5-A-Day study instrument, readiness to change was assessed using a series of questions and instructions for grouping participants based on their responses. Novel to this tool was the separation of fruits and vegetables as separate food categories and extrapolation of the SOC measure into more questions to simplify staging. In both algorithms, it was deemed important to measure daily intake of fruits and vegetables in addition to assessing readiness to change so participants could be assigned to the appropriate stage of change.

Questionnaire items used to measure FV consumption and stage participants included the following:

1. I am not thinking about eating more fruit [vegetables].
2. I am thinking about eating more fruit [vegetables]...planning to start within six months.
3. I am definitely planning to eat more fruit [or vegetables] in the next month.
4. I am trying to eat more fruit [vegetables] now.

5. I am already eating two or more servings of fruit [vegetables] a day (Townsend & Kaiser, 2005, p. 175).

Participants were categorized as follows into one of five stages for FV consumption depending on their answers:

1. Precontemplation: Reported eating less than two servings of fruits and less than two servings of vegetables a day on separate consumption questions and not thinking about eating more fruits and vegetables
2. Contemplation: Currently eating less than two servings a day and thinking about starting to eat more in the next six months
3. Preparation: Currently eating less than two servings a day and definitely planning to start eating more in the next month
4. Action: Eating less than two servings a day, thinking about eating more, and already trying to eat more
5. Maintenance: Reported eating at least two servings of fruit and at least two servings of vegetables a day on separate consumption questions (Townsend & Kaiser, 2005, p. 175).

The TTM also has shown merit for measuring readiness to change PA behaviors.

Similar to the previous examples, the combination of a behavior frequency question paired with a staging algorithm has been used to apply the TTM to PA. Hellsten et al. (2008) reviewed common SOC measures used with nine different PA interventions and determined them to be behaviorally valid and consistently supported with self-reported PA and sedentary behaviors and measures of physical functioning. As one of the authors of this study, Nigg (2005) explained that

measures of self-reported PA typically include some assessment of whether or not participants regularly meet published guidelines for PA. These measures are then used in conjunction with stage-based belief or attitude statements to determine an individual's SOC. He described the following categories for readiness to change PA behaviors:

1. Precontemplation: Not regularly physically active and have no intention of becoming regularly physically active
2. Contemplation: Not regularly physically active but are intending to become regularly physically active in the next six months
3. Preparation: Not regularly physically active but are intending to become regularly physically active within the next 30 days
4. Action: Have been physically active regularly for fewer than six months
5. Maintenance: Have been physically active regularly for six months or longer (Nigg, 2005, p. 32).

Blaney et al. (2012) validated measures of readiness to change PA behaviors with a sample of African-American adults living in North Carolina. Participants first reported their frequency, duration, and intensity of PA in a typical week, then indicated which of five descriptions of readiness to engage in regular PA they felt described them. Once the participants were assigned to a stage of change, various mediating factors were measured for comparison. Study authors concluded that while TTM research with PA had already shown promise, many studies were conducted with a primarily white population. The results of this study showed the value of the TTM in understanding PA behaviors among an African-American audience.

Readiness to change health behaviors, like FV consumption and PA, is a valuable outcome measure for social marketing interventions. The underlying goal of changing behavior

at both the individual and population level takes time to achieve and often is challenging to measure. Therefore, Gregson et al. (2001) suggested measuring readiness as a behavioral antecedent to show early indication of program effectiveness when measuring actual behavior change is difficult.

Evans (2006) agreed that the varied intent of health messaging makes the TTM valuable for obesity prevention social marketing interventions. Some health messages are better suited for individuals in specific SOC. Certain messages aim to prevent unhealthy behaviors, while others promote adoption or maintenance of healthier behaviors. Similarly, results of a meta-analysis confirmed the TTM was useful for segmenting audiences and creating tailored health messages to individuals in unique stages because of the varying levels of knowledge, understanding, skills, and motivation of individuals in different SOC (Noar, Benac, & Harris, 2007).

Social Ecological Model

Because of the broad scope of social marketing activities influencing multiple levels of influence over individual behavior, experts recommend employing an ecological perspective to acknowledge the role of environments on individual behavior (Lefebvre & Lurie, 1995). As the field of social marketing evolved, some scholars argued for a more upstream approach that acknowledged some behaviors were not entirely under the control of individuals to change (Wymer, 2011). Many health behaviors are in part a result of individual knowledge, skills, and motivation, but also influenced by factors in the environment, government, and culture beyond an individual's immediate control. Therefore, it is important to include public health theory in intervention design to account for the role of external factors in individual behaviors.

Experts have long recognized that educational interventions focused on changing individual behavior are not comprehensive enough to combat the rise of serious public health issues, such as obesity (Stokols, 1996). The Social Ecological Model (SEM) provides a framework for developing interventions that include individual, interpersonal, environmental, and cultural aspects to influence the broader context in which individuals make choices about their physical health (Glanz & Rimer, 2005). The SEM is useful for combining a public health ecological perspective of the environmental influences on health with social marketing principles and individual behavior change theory.

Maibach, Abrams, & Marosits (2007) used a social ecological approach to illustrate how social marketing, and specifically the Four Ps (product, price, place, and promotion) of the marketing mix, could influence the relationship between individuals and their environments to promote population health. They suggested that a product promoted in a social marketing intervention is any health-enhancing product or service. Increasing the availability of products, such as fresh produce or services like medical care, tend to be associated with better population health. Therefore, one goal of social marketing is to provide value to the target audience in the form of some type of helpful product, service, or resource. The term place means the physical environment and its capacity to promote health. The presence of sidewalks, stairs, produce stands, grocery stores, and restaurants with healthy menu items are structures in an environment that can promote healthier options simply by having them available, and even more so if they are available at an affordable price. Inherent to a place are also the policies, laws, and cultural norms and values guiding everyday activity there, all of which can promote or deter from the health of a population. Promotion, a key feature of social marketing and health communications in general, refers to the use of media to spread messages that promote population health and inform target

audience members of the availability of products or services and the benefits relative to the costs. Ideally, social marketing interventions will integrate most or all of these components in a mutually reinforcing manner (Grier & Bryant, 2005).

The social ecological approach guides practitioners to target high-impact personal and environmental “leverage points,” which Stokols (1996) defined as “influential behaviors, roles, and environmental conditions” that “exert a disproportionate influence on personal and collective well-being” (p. 290). Gregson et al. (2001) argued that moving intervention efforts beyond the individual level and into the broader levels of influence described by the SEM might be the only way to make healthy living easy and attainable enough for widespread adoption and sustainability in a competitive market. They recommended planning and evaluating social marketing campaigns using the SEM to improve program quality and accelerate necessary changes in public health.

In practice, social marketing campaigns targeting a low SES, SNAP-Ed-eligible audience developed using a social ecological approach have shown promising results. The Food Hero social marketing campaign targeted low-income mothers with children in the home with messages about eating more fruits and vegetables. Tailored campaign messages and products (healthy recipes) were developed with insight from focus groups and disseminated using various forms of media, place-based messaging around communities, and interpersonal communication (Tobey, Koenig, Brown, & Manore, 2016; Tobey et al., 2017).

Members of the target audience were randomly called for a telephone survey at baseline, and a separate group of target audience members was called for post-intervention survey. While only 12% of participants in intervention communities recalled the brand name, 68% recalled at least one of the campaign messages. In treatment communities, participants in

the post-intervention phone survey reported significantly improved attitudes and beliefs surrounding the barriers to eating fruits and vegetables. The difference in beliefs among treatment community participants also was significant when compared to control community participants, indicating exposure to the campaign may have played a role in the decreased perception of barriers (Tobey et al., 2016).

Social marketing interventions developed using a social ecological approach are promising pieces in the puzzle of obesity prevention because they attempt to influence attitudes and behavior at different levels of society. For example, a campaign directed at a certain target audience may influence individual behavior change, and through implementation with partners in a specific community, might increase community support for nutrition education. In turn, this increased community engagement may help create an environment supportive of behavior change with more opportunities for nutrition education, access to affordable healthy foods and safe physical activities, and community pride in health-related success (Gregson et al., 2001). Instead of viewing obesity as a purely individual issue, an ecological approach to public health posits that individual behaviors take place within a larger context of the environments, or places in which people live, learn, work, shop, and eat, and that conditions in these places can have positive or negative impacts on health (Maibach et al., 2007).

Adult Education Principles in Social Marketing

The growing popularity of the ecological perspective and widespread recognition of the limits of individual responsibility previously sparked debate over the appropriate role of social marketing in health education. In the mid-nineties, critics of social marketing argued that it disregards the importance of education in personal behavior change. Vanden Heede and Pelican (1995) supported this argument using Bloom's Taxonomy (Bloom, 1956) and the six levels of

educational mastery: knowledge, comprehension, application, analysis, synthesis, and evaluation. Nutrition education, they posited, rarely guides people beyond the application of a specific dietary change or behavior, mainly due to limited resources and time constraints. Even more concerning, social marketing aims to bypass cognitive understanding altogether and simply convince people to change their behavior (Vanden Heede & Pelican, 1995).

In rebuttal, leaders in the field Lefebvre and Lurie (1995) contended that social marketing employs a learner-centered approach that offers not only communications campaigns, but also educational opportunities to adults on the appropriate levels and through meaningful channels. Social marketers use consumer research and communication with target audience members to know and respect learners and develop programs informed by the current knowledge base and realities of the learners. Rather than leaving knowledge and understanding out of the equation, social marketers recognize it as a necessary component, but not sufficient itself, to drive health-related behavior change.

Fifteen years later, this concept was reinforced, as Quinn and colleagues (2010) argued for the importance of consumer orientation rather than an expert-driven approach in social marketing. Beginning a social marketing campaign by learning the barriers and motivators to adopting certain behaviors based on lived experiences of target audience members, they insisted, would allow practitioners to develop relevant interventions that resonate with participants' needs and values. The importance of audience inclusion in social marketing design was underscored by the idea of transformative consumer research, which reframes adult target audience members as active participants and collaborators helping researchers understand their behavior in terms of experiences, aspirations, and capabilities in contrast to traditional marketing's simpler categories of needs and wants (Saunders, Barrington, & Sridharan, 2015).

Furthermore, Knowles (1973) described adult learners as often driven by the demands of their social roles. In general, people seek to learn health information when they are faced with a new social role, like becoming a parent; a life change, like a new diagnosis; or the need for new services, such as applying for food assistance (Snyder, 2007). Therefore, social marketing can provide an approach informed by principles of adult education such that practitioners include participants in the development process and strive to understand the target audience's barriers and motivators. Adult education theory would guide social marketers to develop strategies that address the issues of most importance and relevance to the adults they are attempting to help and in ways that are meaningful for the target audience.

Elements of Successful Social Marketing in Public Health and Obesity Prevention

The social marketing approach has been successful in achieving widespread changes in attitudes and behaviors related to a vast array of public health issues (Grier & Bryant, 2005). Some of the most recognizable national social marketing campaigns in recent history have been the VERB campaign for increasing youth PA, developed by the CDC (Huhman et al., 2005), and the Legacy Foundation's Truth campaign for reducing cigarette smoking among youth (Farrelly, Davis, Haviland, Messeri, & Heaton, 2005). Each of these national campaigns experienced successes that could partially be attributed to their inclusion of many of the aforementioned benchmark criteria. For example, they both included 1) formative evaluation and consumer-driven messaging, 2) a mix of complimentary marketing activities to achieve adequate exposure, and 3) an ecological approach that included partnerships and policy, systems, and environmental changes to make the desired behavior change easier and more culturally appealing for the target audience. These and other initiatives have shown that multi-component social marketing campaigns can have a large impact on public health.

Since the inclusion of social marketing in the public health toolbox, the CDC has taken a social marketing approach to influence consumer attitudes and behaviors related to numerous public health issues including sunscreen use, dietary calcium, vaccinations, and diabetes. Social marketing campaigns are ongoing for the promotion of Hepatitis B testing, chronic disease self-management, PA, hand hygiene, and increased awareness of the addictive nature of certain prescription medications (Centers for Disease Control and Prevention, 2019). In addition, obesity prevention specialists have adopted social marketing techniques in recent years due to the ubiquity and complexity of causal factors for obesity including individual behaviors, such as diet and PA, and environmental factors, such as access to affordable healthy food or safe PA opportunities.

Chapter 1 described national and state trends as well as the complex causes of obesity often targeted in prevention efforts. Social marketing can play a key role in encouraging widespread behavioral change to support obesity prevention efforts. Diet and PA are the two primary modifiable individual behaviors that can be addressed to decrease to obesity (Evans, Necheles, Longjohn, & Christoffel, 2007). Poverty poses unique barriers to individual behavior modification and is associated with negative health behaviors such as low FV consumption and increased consumption of caloric beverages, which lead to weight gain (Drewnowski & Specter, 2004). Nutrition education alone has not resulted in meaningful population level dietary changes in these areas, indicating the need for additional intervention strategies (Pettigrew, 2016; Wansink & Chandon, 2014). The role of social marketing within a social ecological obesity prevention context is to acknowledge and understand the individual and environmental barriers to behavior change and provide targeted educational messages and multi-component interventions to audiences most in need of behavioral support.

Formative Research

One of the most highly utilized social marketing components in health promotion and obesity prevention interventions is formative research (Carins & Rundle-Thiele, 2014). Focus groups, key informant interviews, surveys, and population data help social marketers understand factors that influence decisions of the target audience and identify optimal delivery channels through which to reach the audience. Key findings inform the development of consumer-driven educational and promotional materials. Health messages should resonate with an individual's values, beliefs, and life circumstances to influence behavior successfully (Tobey et al., 2016; Young et al., 2004). Once developed, campaign materials should be pretested with the target audience to ensure efforts are successful in gaining their attention and influencing the desired change (Lynskey et al., 2018).

The formative research most commonly reported in successful social marketing studies has been described as “listening: understanding the behaviors involved, the barriers and motivators concerned, the preferences of the audience being considered, and the audience's readiness to change” (Carins & Rundle-Thiele, 2014, p. 1635). According to Snyder (2007), formative research helps social marketers fine tune the specific behavior to promote through observing or interviewing members of the target audience, soliciting feedback on campaign materials, and altering messages accordingly. This approach has contributed to the success of many health promotion and obesity prevention campaigns. A review of health-related social marketing interventions concluded there is strong evidence that targeted, audience-tested social marketing interventions can effectively improve diet and increase PA among a variety of target audiences (Gordon et al., 2006).

Young et al. (2004) summarized the process of using formative research to develop social marketing obesity prevention initiatives for specific audiences:

After a health-related problem is identified, the target audience is critically analyzed to learn its values, attitudes, opinions, interests, learning characteristics, occurrence of target behaviors, and preferred media outlets. Further, potential materials, messages, and themes are presented to the consumers and refined based on their suggestions. It is reasoned that if the clients direct the program development, it is more likely that the intervention will affect the desired behavior change. (p. 250)

Health professionals designing social marketing interventions for a variety of target audiences, ranging from American college students to impoverished Bolivian women, have systematically followed this process (Shive & Morris, 2006; Warnick et al., 2004).

Because obesity is more prevalent among groups with low SES (Warren et al., 2020), and because parents not only make decisions about their behavior, but their children's as well (Gross, Pollock, & Braun, 2010), a wealth of formative research has been conducted with this audience to understand motivators and barriers to healthy eating. For example, immigrant parents with low SES in California reported in a survey that barriers to eating a healthy diet include cost, limited access, preferences for less healthy foods and beverages, and lack of knowledge or understanding of a healthy diet (Sugerman et al., 2011). Similarly, mothers with low SES in rural Oregon explained in a focus group that providing meals on a limited budget while catering to family members' unique food preferences poses difficulty in offering healthy options (Hampson, Martin, Jorgensen, & Barker, 2009). Members of focus groups conducted with parents with low SES in Maine reported many of the same barriers to consuming more fruits and vegetables such as budget constraints, limited cooking skills, and family taste preferences. However, participants

still expressed the most interest in eating more fruits and vegetables as opposed to practicing portion control or eating low-calorie foods, which were seen as restrictive or difficult to achieve (Dharod, Drewette-Card, & Crawford, 2011).

Food marketing and health information itself has been cited as a barrier for parents offering healthy foods at home. Mothers participating in focus groups expressed that excessive marketing of unhealthy items makes healthy choices less appealing and harder to make (Hampson et al., 2009). In formative evaluation for the national Fruits and Veggies – More Matters campaign, adult parents of elementary-aged children identified information overload as a barrier to understanding nutrition recommendations. Focus group discussions revealed that competing health information and nutrition messages disseminated by a multitude of sources of unknown credibility confused and overwhelmed consumers (Pivonka, Seymour, McKenna, Baxter, & Williams, 2011).

Notable barriers and motivators related to PA among populations with low SES are evident in research as well. African American, predominantly female focus group participants from an economically disadvantaged South Carolina community reported environmental barriers to PA related to the safety of their neighborhood (i.e. crime, traffic, and stray dogs) and the lack of infrastructure such as sidewalks, streetlights, and parks. On the other hand, a sense of community, structured activities and heightened safety measures were identified as potential motivators for PA (Griffin, Wilson, Wilcox, Buck, & Ainsworth, 2008).

Similarly, Van Duyn et al. (2007) conducted focus groups with minority adults with low SES from Texas, California, Mississippi, and Hawaii to understand attitudes about PA. Overall, the group expressed a belief that their respective cultures valued PA and shared a desire for social support and increased access to PA venues. Barriers mentioned by participants were

similar to those previously reported by adults with low SES, regardless of cultural context. These included limited time, transportation, and resources compounded by safety concerns, lack of access to places to be active, and lack of structured activities.

Formative research also has been conducted to determine factors associated with sugar-sweetened beverage (SSB) consumption, since it has been identified as a modifiable dietary behavior that contributes to obesity. Recently, a phone survey of over 1,000 Oklahoma adults with children living in the home revealed that parents having a high school education or less was strongly associated with both the adults and children in the home drinking higher amounts of SSB. Other factors associated with SSB consumption among adults surveyed were male gender, ages 18-34, lower perception of the health quality of personal diet, and drinking fewer than 8 cups of water per day. The association between lower daily water intake and higher daily SSB intake was a novel finding for this study. Authors concluded that targeted media campaigns promoting increased water consumption to adults with low SES may be effective for decreasing SSB intake, caloric intake, and ultimately obesity (White, James, Paulson, & Beebe, 2018).

Studies have demonstrated that social marketing interventions with formative research in their design and evaluation plans have been effective in improving diet and PA attitudes and behaviors among various target audiences (Gordon et al., 2006). One example is the Food Hero social marketing campaign. Tobey, Koenig, Brown, and Manore (2016) conducted formative and outcome evaluation of a social marketing campaign designed to increase FV consumption among low SES mothers in Oregon. Following social marketing principles, the researchers used insight from the target audience via focus groups and phone surveys to inform campaign development. Consistent with previously reported barriers and motivators, Food Hero participants reported

interest in increasing FV intake, but felt barriers like cost, time, and lack of understanding of food preparation and meal planning made behavior change difficult (Tobey et al., 2016).

After conducting a series of focus groups to understand the target audience and test reactions to drafted campaign materials (images, logos, and brief messages promoting behavior change), the Food Hero campaign was implemented for two consecutive months in four counties. Many delivery channels were used to spread campaign messages, including billboards, web banner ads, direct mail, website, grocery cart ads, and local nutrition educators. The campaign also was promoted via social media, radio, and local television (Tobey et al., 2016).

To evaluate the reach and effectiveness among the target audience, researchers obtained a list of low SES mothers from the Oregon Department of Human Resources and called them with an invitation to participate in a short telephone survey. One control county where messages were not distributed also participated. Phone surveys were conducted at two time points with different participants. Recall of campaign messages and awareness of the Food Hero campaign was relatively high among counties with intervention; 68% of participants recalled encountering at least one message. There was a significant change ($p < 0.05$) in attitude about fruits and vegetables observed between the first phone survey (pre-intervention) and the second phone survey (post-intervention). Specifically, participants in the second survey reported feeling more ease in getting their families to eat fruit, and they were less likely to feel that eating enough fruits and vegetables is too expensive. The authors concluded that social marketing campaigns are more likely to be effective when formative research with a specific target audience informs development of intervention materials and messages (Tobey et al., 2016).

Understanding barriers and motivators to adopting healthier behaviors among a target audience is a key factor in developing interventions, messages, and materials that resonate with

the intended audience and result in behavior change (Tobey et al., 2016). Reviewing existing formative research and conducting new formative research with the specific target audience are important first steps in campaign development that enhance the social marketer's ability to effectively communicate with the intended audience (Loughrey et al., 1997). These and numerous other formative studies have informed and continue to inform development of social marketing campaigns to resonate with the barriers and motivators, beliefs, and realities of adults and parents with limited resources (Dharod et al., 2011; Pivonka et al., 2011; Tobey et al., 2016).

Tailored Messaging

A recurring finding among social marketing researchers is the importance of carefully identifying behaviors with the most potential to change and crafting tailored messages to be meaningful to the intended audience. Promoted behaviors must seem realistic to the audience member and reflect an understanding of their lifestyle, resources, current behaviors, beliefs, and values (Snyder, 2007). Emphasizing different points or invoking certain emotions are tactics that have been shown to greatly affect a message's effectiveness with its intended target audience (B. J. Wilson, 2007). Insights from past social marketing campaigns therefore are relevant to social marketers working with similar target audiences today.

Beginning in 1990, the Department of Health in Western Australia tracked FV consumption over time while using a widespread social marketing campaign, Go for 2&5, to promote eating two servings of fruit and five servings of vegetables a day. Messages used in mass media evolved over time in response to measured changes in consumption patterns of Western Australians. Messages simply reminding or educating consumers to eat more fruits and vegetables were effective for increasing fruit consumption; however, vegetable consumption remained stagnant. In 2003, the Go for 2&5 campaign messaging style shifted to include probing

self-assessment questions, “How many serves [*sic*] of veggies did you really eat today?” and “Did you have your five serves [*sic*] of veggies today?” This shift was associated with moderate success for the first time in over a decade, as data from the Western Australia Health and Wellbeing Surveillance System revealed that the average servings of vegetables increased by half a serving per day in 2005 (Carter, Pollard, Atkins, Milliner, & Pratt, 2011).

Identifying problematic messaging in existing campaigns is a continued application for formative research beyond initial campaign development. Mid-intervention focus groups for the Go for 2&5 campaign with economically disadvantaged adults revealed that although moderate improvement in outcomes had been achieved by incorporating probing self-assessment into campaign messages, these messages still needed further adapting. Many people in the target audience misunderstood and overestimated the size of a serving of vegetables. This led to a general attitude that eating enough vegetables was unattainable, which created a motivational barrier to attempting to eat more vegetables. Furthermore, the predominant barrier agreed upon by focus group participants was the belief that eating five servings of vegetables every day, as the campaign encouraged, was not only unrealistic, but also unnecessary to achieve good health (Carter et al., 2011).

Similarly, focus group research for the successful Maryland Women, Infants, and Children (WIC) 5-A-Day program found that many mothers with low-incomes believed five servings a day to be unrealistic and appreciated messages encouraging them to simply increase consumption of fruits and vegetables without assigning an ideal amount, thus allowing them to set personally attainable goals (Havas et al., 1998). Pivonka et al. (2011) discovered the same sentiment in their focus group testing for the Fruit and Veggies – More Matters campaign. When specific messages tailored to convince people to eat more fruits and vegetables were tested in

focus groups, participants preferred messages encouraging small additive changes to messages that included dietary recommendations of the actual amounts of fruits and vegetables that should be eaten each day. This preference was attributed to the fact that participants felt the recommended number for FV servings seemed unachievable.

In an attempt to understand the effects of different types of messaging, Cadario and Chandon (2019) conducted a meta-analysis to see which style of influencing people's food choices works best. Interventions were classified as either cognitively oriented, affectively oriented, or behaviorally oriented and compared for effectiveness. They found that affectively oriented interventions, or those which attempt to influence people's eating goals or habits by "healthy eating calls" encouraging them to do better were more effective than cognitively oriented interventions, which seek to inform consumers of nutritional information to sway their decision making.

The most effective intervention strategy was to incorporate behavioral nudges, which make the healthy choice more convenient to make. For example, restaurants using smaller dishes or portion sizes, stores or cafeterias offering pre-sliced fruits or making them "grab and go" options, are behaviorally oriented interventions. This research suggests that interventions can be expected to have an increasing effect as they move from cognitive to affective to behavioral or include a combination of approaches (Cadario & Chandon, 2019).

Another opportunity for tailoring nutrition messages identified by Pettigrew (2016) was focusing on the pleasurable aspect of eating. Focusing promotional efforts on highlighting the pleasure associated with a particular food, rather than the health benefits may be more likely to influence consumers to try healthy foods. Promotional materials depicting people enjoying the

taste or experience of eating healthy foods may encourage consumers to try and continue to choose healthy foods with more effectiveness than more traditional health messaging emphases.

The selected target audience drives the use of tailored messaging. The two most common target audiences selected for nutrition-focused social marketing campaigns have been children and adults of low SES (Pettigrew, 2016). Therefore, parents with low SES may be a key audience of interest for obesity prevention social marketing interventions because messages can influence not only the adult of low SES, but also their children.

Parents in particular have responded to messages tailored to resonate with their role as a caretaker in a positive manner. Pivonka et al. (2011) found that gentle nudges served as positive reminders of the importance of a mother's sense of responsibility in caring for her family and for herself. Tailoring nutrition messages to parents may influence their personal behaviors, and in turn increase parental modeling of healthier behaviors in front of their children, which is a known influencer of child FV consumption. In effect, marketing messages tailored for one audience (parents), may inherently influence the habits of a secondary group (children) over which the primary group has influence (Bublitz & Peracchio, 2015).

Overall, messages that are positive and encouraging, but realistic and achievable, have shown more promise for persuading long-term behavior change than informative or educational messages (McKinnon, 2007; Snyder, 2007). Many of the most effective campaign messages have been tailored to specific audiences to positively promote the adoption of new behaviors instead of discouraging existing behaviors (Fitzgibbon et al., 2007). In fact, a meta-analysis of effect sizes reported in health communications campaigns revealed that messages encouraging commencement of new behaviors were more effective at influencing behavior than messages of prevention or cessation (Snyder et al., 2004).

Health Branding

Health branding has emerged as a promising intervention strategy in social marketing for obesity prevention. In practice, health branding advises the use of positively framed health marketing approaches to build a brand that encourages adoption of healthy behaviors as opposed to using negative messaging to discourage unhealthy behaviors. In addition, the positive aspects of healthy foods or activities highlighted in a health-branding approach draw attention to determinants of choice such as taste, convenience, cost, disease prevention, physical performance, and pleasure. This is in contrast to more traditional forms of health intervention that focus on nutrient composition or health benefits of foods, beverages, or activities which are often valued less by consumers (Englund, Zhou, Hedrick, & Kraak, 2020).

Pivonka et al. (2011) described a brand as “attributes and symbols such as name, graphic, slogan, design scheme, and core messages that represent values, ideas, and personality, with the objective of creating a relationship of trust about what the product or service will deliver” (p. 1571). Another objective of a brand is to “create mental representations in the minds of consumers about products, services, and organizations” (Evans, Blitstein, Vallone, Post, & Nielsen, 2015, p. 24). Specifically, the purpose of health branding is to form a relationship with consumers to increase their engagement with a health intervention and positively influence their behavior (Evans, Blitstein, et al., 2015). Building a brand around public health issues or healthy lifestyle factors is an innovative technique for promoting behaviors that improve health and has been effective with youth and adults (Evans, Blitstein, et al., 2015). Incorporating multimedia content, such as social media, YouTube videos, contests, and games has been recommended for branded social marketing campaigns promoting healthy eating because these activities may help foster positive feelings toward the brand, product, or behavior (Bublitz & Peracchio, 2015).

Promoting a brand simultaneously with a behavior creates something the target audience can interact with, relate to, aspire to, align themselves with, and therefore want to emulate (McKinnon, 2007). This phenomenon, referred to as *brand equity*, has been linked to reduction of smoking among teens, for example. By using a branding strategy, social marketing campaigns essentially find a way to compete with commercial marketers by appealing for the loyalty of the target audience and convincing them to adopt a behavior different from that which commercial marketers promote (Evans, Renaud, et al., 2007).

In a systematic review of health branding interventions, Evans, Blitstein, et al. (2015) determined that over half (54%) of 48 identified campaigns used formative research in development of the brand names, logos, and imagery. The majority (79.2%) used paid media such as commercial advertising channels to promote branded messages. One of the most common tactics used to encourage brand engagement was audience segmentation (56%), while a notable, but less common, tactic was tailored messaging (25%). Most campaigns (68.7%) were evaluated using an observational design, with general awareness being the most frequently reported brand measure. According to Rekhy and McConchie (2014), good brand awareness indicates that a campaign has potential to continue promoting behavior changes, like increasing FV consumption, into the future.

One of the larger national social marketing campaigns of the 2000's, VERB, has provided insight into the relationship between brand awareness and PA attitudes, beliefs, and behaviors among parents of 9-13 year olds. The campaign was evaluated with baseline and follow up random digit dialing telephone surveys. Parents were categorized as having "unaided awareness" if they could recall the brand and slogan without help, or as having "aided awareness" if they required some prompting in order to select the brand name and slogan from a

list. Over a three-year campaign, both types of awareness increased significantly between years. In the final year, any type of awareness was associated with significantly more positive attitudes and beliefs about PA. Furthermore, overall brand awareness was a significant predictor of behavior, specifically the number of days parents reported being physically active with their children in the week prior to the survey (Price, Huhman, & Potter, 2008).

A more localized branded social marketing campaign, named 5-4-3-2-1 Go!, successfully targeted Chicago parents, primarily African American and Hispanic and of low SES, with messages about increasing FV consumption, water or milk consumption, and PA (Evans, Christoffel, Necheles, Becker, & Snider, 2011; Evans, Wallace, & Snider, 2015). The intervention relied on multiple delivery channels for campaign messages and outreach activities designed to address the 4Ps of the marketing mix. Campaign components emphasized how to achieve health goals affordably (price), were present in a variety of daily life settings (place), provided specific and action-oriented guidance to promote nutrition and PA (product), and utilized positively framed, targeted messages (promotion). Campaign messages were disseminated through several delivery channels, including mass media, community and school-based events for youth and parents, promotional posters in various community settings, and in one subgroup, brief counseling sessions with parents in which branded daily use items such as water bottles and refrigerator magnets were provided to reinforce messages.

The evaluation of the 5-4-3-2-1 Go! campaign consisted of baseline and follow-up interviews with parents, all of whom were potentially exposed to campaign messages. At baseline, 524 parents provided self-reported data on attitudes and behaviors related to fruit, vegetable, water, and milk consumption, PA, and screen time. Follow-up proved difficult with the target audience, but 252 (48.1%) participants completed a second interview. Message recall

and brand awareness were assessed at follow-up as were attitudes and behaviors. Researchers found significant increases in positive behaviors from baseline to follow-up, with the brief counseling displaying a significant effect on FV consumption specifically. Exposure was assessed by asking questions about message and brand awareness and recall and asking participants to identify delivery channels through which they had been exposed to messages. Notably, there was a strong relationship between school-based exposure to 5-4-3-2-1 Go! messages and higher levels of water consumption. Authors concluded that schools present an opportunity for parent-focused social marketing campaigns to achieve greater exposure and impact (Evans et al., 2011).

Research has suggested a positive association between employing a brand for health messaging and behavioral outcomes. The difficulty of achieving rigorous study designs in social marketing that would help develop this knowledge base further is evident in the literature. There is a recognized lack of empirical evidence that reveals the need for more branded social marketing campaigns with positively framed health messaging to conduct evaluations and disseminate findings (Englund et al., 2020). Despite these shortcomings, health branding has been associated with behavior change, notably with participants in the adoption and maintenance SOC, and is considered a powerful tool to enhance social marketing interventions (Evans, Blitstein, et al., 2015).

Exposure

Exposure is one of the most essential aspects of a successful social marketing campaign. Changes in dietary behavior can be difficult to achieve, and even more difficult to sustain long-term. Repeated exposure to nutrition messages with a behavioral focus delivered through a variety of relevant channels can improve accuracy of message recall among participants and

positively impact sustainability of dietary change (Gregson et al., 2001; Snyder, 2007). In fact, the inability to reach high enough exposure levels among a target audience has been cited as a frequent cause for campaign failure (Hornik & Kelly, 2007).

Hornik and Kelly (2007) explained the importance of achieving exposure in health marketing campaigns in a report on communications used in diet-related interventions. They noted that researchers often focus on selecting a target behavior and intervention strategy while overlooking planning how to reach the largest audience consistently and repeatedly. They urged campaign developers to avoid this common pitfall by carefully selecting the target audience from the onset to ensure adequate exposure can be achieved.

They presented five basic arguments for the importance of achieving exposure in health communications and marketing campaigns. First, repetition works for learning. Second, repetition also increases the likelihood a message will reach an audience member at the right time when they are ready to learn and change. Third, when people observe the same message from a variety of channels, they tend to perceive multiple sources are making the same claim, which increases its legitimacy for them. Fourth, high exposure may lead to increased conversations regarding the message within social networks. Fifth, high exposure may lead to a perception of increased public interest and gain the attention of policymakers (Hornik & Kelly, 2007).

Many examples of the relationship between exposure and campaign effectiveness are documented in health communications and social marketing literature. In the aforementioned study evaluating Australia's social marketing campaign, Go for 2&5, researchers found a relationship between FV consumption and exposure to program strategies, including cooking demonstrations, learning activities at community events, and messages in school newsletters.

Each exposure to an additional, unique program strategy led to a 2% increase in self-reported daily fruit intake and a 1.1% increase in self-reported daily vegetable intake (Glasson et al., 2013). Similarly, findings from America's national social marketing campaign promoting PA to youth, branded as VERB, revealed that as the frequency of exposure to campaign messages increased, PA levels also increased in a direct correlation (McKinnon, 2007).

Havas et al. (1998) implemented the multicomponent 5-A-Day campaign with WIC participants in Maryland. The campaign components included peer-to-peer education, communications materials, educational reinforcement items, and direct mail. Participants were segmented based on where they fell in the SOC continuum, and intervention materials were tailored differently for the different stages. Researchers observed self-reported movement across the SOC from baseline to post-assessment and one-year follow-up. These movements across stages were closely tied to the level of exposure participants had to the various delivery channel employed by the intervention.

This local intervention happened concurrently with a national campaign called 5-A-Day for Better Health run by the National Cancer Institute. The treatment group that was exposed to the targeted campaign showed significant differences compared to the control group who would have been exposed to the broader national campaign. The control group would have had no exposure to the more targeted local campaign, which was developed through focus group testing with the specific target audience. Researchers attributed the success of this intervention to the combination of theory-based design and consumer orientation with repeated exposure.

Exposure is measured in a variety of ways, depending on the media channel and components of the social marketing campaign being evaluated. Campaigns employing mass media, such as billboards, television, or radio advertisements, often assess exposure on a broad

level by estimating the number of times a message was printed, aired, or possibly viewed by the target audience. These data may be supplied by commercial marketing companies providing the media in the form of gross rating points, hits, or impressions. In this form, exposure serves as a process evaluation measure or a predictor of campaign success (Randolph & Viswanath, 2004).

At the individual level, exposure can be measured by surveying the target audience and probing for recall or recognition of campaign messages and brand logos. Audience members may be asked if they recall certain aspects of a campaign, and if so, if they recall where or through which type of media they were exposed (Randolph & Viswanath, 2004). In the absence of a randomized trial, it is impossible to conclude a causal relationship between exposure to campaign strategies and behavior change. However, when exposure is adequately achieved and measured, it often has been associated with substantial individual behavioral outcomes.

Achieving and measuring exposure has posed challenges for past social marketing campaigns targeting low SES audiences. Some researchers have reported difficulty obtaining evaluation data from members in the target audience, especially when data is collected at more than one time point (Evans et al., 2011). Others have reported difficulty interviewing minority or low SES demographics when methods like random digit dialing are employed for telephone interviews (James, White, Paulson, & Beebe, 2020; Price et al., 2008).

For this reason, experts recommend narrowing the target audience to a group for which adequate exposure is achievable and measurable. Exposure should be prioritized in planning, implementing, and evaluating to ensure high exposure is achieved through multiple channels and repeatedly over time. A perfectly designed social marketing campaign that follows all recommended practices will fall flat if the target audience is not exposed to the message (Hornik, 2002).

Mass Media in Obesity Prevention Social Marketing Campaigns

Large-scale social marketing campaigns have historically relied, at least in part, on mass media such as billboards, television, radio, and digital advertisements to ensure high levels of exposure are achieved. Although mass media campaigns can be costly, Snyder (2007) proposed that the cost per person is much less than individual approaches such as counseling. Recently, a review of branded health marketing campaigns concluded that mass media may be a cost-effective means of achieving exposure and influencing target audience behavior (Englund et al., 2020).

Mass media has been a prominent feature of many social marketing and health communications campaigns at the local and national levels. Randolph and Viswanath (2004) suggested that a successful mass media campaign would not only bring information to the public, but also would frame a problem as a public health issue, grab the attention of its target audience, and offer a solution to the problem. Achieving these goals, they argued, has resulted in quantitative and qualitative changes in both the information environment and in individual behaviors in numerous interventions.

One example of mass media successfully influencing widespread health behavior change was the 1% or Less campaign conducted in West Virginia (Reger, Wootan, & Booth-Butterfield, 1999). Reger and colleagues designed simple messages promoting low-fat milk consumption and promoted them through mass media, specifically television, radio and newspaper. After six weeks of campaign messages, low-fat milk sales in the intervention city increased by 17% and remained steady for six months. Additionally, telephone survey respondents self-described as high-fat milk drinkers in a pre-assessment reported switching to low-fat milk in a post-assessment after exposure to campaign messages. The authors attributed

the campaign's success to the repetitive nature of media messages and the simple, task-oriented messaging that simplified complicated nutrition guidance (lower saturated fat intake) into manageable steps.

More recently, James et al. (2020) conducted a statewide mass media campaign in Oklahoma, called Shape Your Future – Rethink Your Drink, to encourage behavior change related to SSB consumption among parents with children in the home. Researchers used random digit dialing to conduct cross-sectional telephone surveys with members of the target audience at baseline and again with a new sample of target audience members after the first quarter of the ongoing campaign. Self-reported beverage consumption, knowledge, and attitudes were measured at both time-points to assess the reach and effect of campaign messages. Overall levels of self-reported SSB consumption decreased by 19% between the first and second surveys.

Notably, certain subgroups, such as those with a high school education or less and those having trouble affording healthy foods, experienced higher declines in SSB consumption. There were no significant differences in exposure between demographic subgroups, with the exception of higher exposure rates for women than men. This underscored the campaign's ability to reach and impact an audience that included those of lower SES. On the other hand, researchers acknowledged their exposure levels were lower than desired (24% of Oklahomans with children in the home), especially among Native American parents. This limited exposure likely contributed to the lack of significant association between exposure and SSB consumption. However, the campaign was successful in increasing knowledge about the negative health effects of SSB, with significant differences observed among those exposed to campaign messages compared to those not exposed (James et al., 2020).

Mass Media in a Social Ecological Context

Though mass media has shown varying levels of effectiveness on its own, experts have acknowledged the benefit of using mass media in the context of multi-component interventions using a social ecological approach to bring about lasting behavior change (Dorfman & Wallack, 2007; Fitzgibbon et al., 2007). The concept of integrating nutrition and PA social marketing campaigns with educational programs and strategies to change policies, systems, and environments is well supported in the literature (Randolph & Viswanath, 2004). Environmental barriers to behavior change may necessitate action beyond traditional media communications and education of individuals to include collaborating with local organizations, businesses, or government to change policies, systems, and environments to make healthy choices easier to access. Even after PSE changes have been implemented, social marketing can continue to play a role in increasing awareness, appeal, and demand among the public for newly available healthy options and opportunities (Snyder, 2007).

Multi-component social marketing campaigns including mass media have been shown to enhance effectiveness of educational interventions by adding additional techniques for reaching participants and influencing their behavior with messages that reinforce education. Blitstein et al. (2016) added the Pick a Better Snack social marketing campaign, complete with billboards, television and radio ads, community-placed signage, and special events, to an existing school-based nutrition education program provided in low SES communities. The goal was to extend the reach of their school-based obesity prevention intervention to parents, since their influence on child nutrition behaviors has been well-documented (Draxten, Fulkerson, Friend, Flattum, & Schow, 2014; Hanson, Neumark-Sztainer, Eisenberg, Story, & Wall, 2005; Trost et al., 2003). Blitstein and colleagues used a combination of pre- and post-assessments with youth

participants and baseline and follow-up mail and telephone surveys with parents to evaluate the effects of the intervention on child dietary behaviors. Participants were assigned to one of three groups depending on the child's school: a group that only received the school curriculum, a school curriculum plus social marketing group, and a comparison group. Researchers found increased effectiveness of the intervention with the addition of the Pick a Better Snack campaign. Compared to the comparison group, the curriculum only group reported significant increases in fruit consumption and the curriculum plus social marketing group reported significant increases in FV consumption. Furthermore, the curriculum plus social marketing group reported significantly higher use of low-fat or fat-free milk compared to the curriculum only group. These results highlighted the ability of social marketing to enhance the effectiveness of already successful obesity prevention programs by building in a social ecological approach that can extend reach into homes and communities and provide repeated exposure to health messages.

Conversely, effects of mass media campaigns have been greater when media messages were accompanied by supportive environments where target audience members were given opportunities to try behaviors being promoted (Randolph & Viswanath, 2004). Describing a multi-component social marketing effort to increase cancer awareness among a low-income, high-risk target audience, Hastings and McDermott (2006) likened mass media to "the visible tip of a much bigger iceberg of activity" (p. 1211). Essentially, mass media can be a valuable component of a larger branded social marketing campaign meant to unify a multi-component effort to change specific behaviors.

Physical activity messages in particular appear to have stronger effects when used to enhance a social ecological approach that includes behavioral interventions and/or PSE changes. For example, the Step Up. Step Out! study used a theory-driven social marketing approach to

determine differences between mass media social marketing when used alone and in combination with behavioral intervention strategies to promote PA. The intervention community chosen for this research was actively engaged in an ongoing community-university partnership using a social ecological approach to promote PA through PSE changes (Sharpe et al., 2010).

For this study, women ages 35-54 participated in focus groups that guided development of the project's name, logos, mass media messages, and graphic artwork. Mass media channels (billboards, newspaper, radio, and cable television) were used to deliver message exposure in selected communities for one year. A media exposure only group was compared both to a non-exposed group and to a media exposure plus minimal-contact behavioral intervention group. Pre- and post-intervention cross-sectional telephone surveys using random digit dialing were conducted with target audience members living in communities with media exposure and communities with no media exposure. Similarly, participants in the media plus behavioral intervention arm completed pre- and post-assessments.

Findings revealed that the media exposure plus minimal-contact behavioral intervention group reported a higher recall of media messages and greater pre- to post-intervention positive behavioral differences, such as walking minutes, PA minutes, and use of parks and trails, compared to the media exposure only group and the no media exposure group. While positive changes were observed in the media only group, some also were observed in the no media group. This might have been attributed to changes in communities as part of the broader social ecological approach (Sharpe et al., 2010). The difficulty of obtaining a true control group is a documented barrier to evaluation of social marketing and multilevel programs (Grier & Bryant, 2005; Hornik & Kelly, 2007). Nevertheless, the results of the Step Up. Step Out! study highlight

the importance of understanding social marketing as more than a standalone media campaign, but a combination of tailored strategies promoting behavior change synergistically.

Considerations for Study Design and Evaluation

As Grier and Bryant (2005) explained in their highly cited review and recommendation paper, social marketing campaigns evolve over time and attempt to reach large numbers of people through complex, multi-component interventions. This makes them notoriously difficult to evaluate and makes the gold standard randomized controlled trial and other experimental designs unattainable. They argue for the use of alternate designs to provide insights on the campaign's performance related to achieving exposure among the intended target audience, creating brand awareness, identifying differences between those exposed and not exposed to campaign messages and activities, and identifying segments of the target audience that remained unreached or did not appear to be influenced by exposure. Additionally, Evans (2006) recommended evaluating effectiveness using measures of exposure and awareness and behavioral outcomes, and using results to inform the refining of campaign materials for future campaigns with the target audience (Evans, 2006).

Experts warn that achieving measurable results from large social marketing campaigns requires both financial investment and time. A noteworthy similarity between commercial marketing and social marketing is the need for continued investment over time to raise the likelihood that desired behavioral outcomes will be achieved and sustained (Pettigrew, 2016; Rekhy & McConchie, 2014). Hornik and Kelly (2007) advised social marketers to set realistic expectations regarding the time it will take to achieve change and the amount of change expected to occur. They also encouraged this realistic approach in evaluation, encouraging social marketers to evaluate, but not at the expense of getting the message out.

Summary

Social marketing offers a unique lens for understanding and influencing individual behaviors that contribute to complex societal issues such as obesity. Well-designed social marketing campaigns can exert influence not only on individuals, but also in interpersonal relationships, organizations, communities, and social structures (Gregson et al., 2001). Therefore, social marketing is recommended for use in SNAP-Ed in combination with nutrition education and PSE change strategies to impact individuals, groups, and society as a whole at all levels of the SEM. For campaigns situated within a social ecological approach, it is recommended to evaluate on the individual level using the TTM to identify individuals' stage of readiness to change (Gregson et al., 2001).

There is strong evidence that social marketing can impact nutrition and PA behaviors (Gordon et al., 2006), and many factors discussed in this review have been shown to contribute to the success of various campaigns. Theory-based social marketing campaigns employing a variety of delivery channels developed following benchmark criteria and evidence-based practices such as formative research, tailored messaging, health branding, and exposure maximization have exhibited success in nutrition and PA interventions from the individual level to the broader community and public policy levels. Because of the consumer-orientation inherent in social marketing, successful campaigns do not automatically reach and influence different target audiences with equal effectiveness. Therefore, social marketing literature has stressed the importance of initially selecting a narrow target audience for which exposure is achievable and then customizing campaign materials and messages to help ensure positive behavioral outcomes (Hornik & Kelly, 2007; Tobey et al., 2016). While the field of social marketing is not new, there remains much to be learned about its potential to influence nutrition and PA behaviors for a

variety of audiences. Experts acknowledge the need for more theory-based, branded social marketing campaigns with positively framed health messaging to conduct evaluations and disseminate findings (Englund et al., 2020; Luca & Suggs, 2013).

Chapter 3

Methods

Introduction

This chapter describes methods used to evaluate a social marketing campaign introduced in Chapter 1. In Chapter 2, an explanation of social marketing was provided and the importance of theory in social marketing design and evaluation was discussed. The following elements shown to contribute to the success of social marketing campaigns in public health were explored: formative research, tailored messaging, health branding, and exposure maximization. Focus eventually narrowed to social marketing interventions with a mass media component, which contributed to the campaign design, implementation, and evaluation methods used in this study. Chapter 3 describes the design, campaign development and implementation, as well as data collection and analysis for this study.

Purpose of the Study

The purpose of this study was to examine the relationship between exposure to a targeted social marketing campaign and the campaign's target nutrition and PA behaviors among SNAP-Ed eligible parents in Alabama. The LWA campaign utilized numerous methods for building brand awareness and disseminating messages to the target audience, including mass media (e.g. billboards), social media, text messaging, branded recipe cards with accompanying online videos, and signage in partnering organizations (e.g. parks, walking trails, grocery stores, farmers markets, schools). The evaluation conducted for this study primarily concerned the largest component of LWA, a 12-week, statewide billboard campaign comprised of three messages promoting 1) FV consumption, 2) PA, and 3) water consumption.

Research Questions

This study attempted to answer the following research questions:

- 1) To what extent are the brand and messages for the targeted social marketing campaign, LWA, recognized by SNAP-Ed eligible adults?
- 2) To what extent are there differences in exposure to campaign messages by demographic and other characteristics of the SNAP-Ed eligible adult survey respondents?
- 3) Was the use of a convenience sample of BQ parent participants a confounding variable in this social marketing study?
- 4) What is the relationship between exposure to a targeted social marketing campaign and self-reported nutrition and PA behaviors of SNAP-Ed eligible adults?
- 5) What is the relationship between exposure to a targeted social marketing campaign and SOC related to FV consumption and PA among SNAP-Ed eligible adults?
- 6) What are the most commonly reported barriers to FV consumption and PA among SNAP-Ed eligible adults?

Methods

For this dissertation, a secondary retrospective analysis was conducted using data previously collected by the primary researcher under Auburn University's Institutional Review Board, Protocol #17-288 MR 1707 (Appendix A). In 2018, the SNAP-Ed grant of Alabama Extension implemented a statewide social marketing campaign, the largest component of which was a billboard campaign. In an effort to target parents of elementary-aged children, billboards were located in proximity to elementary schools, and a phone survey evaluating the social

marketing campaign was conducted with participants in SNAP-Ed's school-based intervention for parents of elementary-aged children, Recipe Tester Club for Body Quest Parent. The phone survey measured LWA brand awareness and exposure to billboard messages and assessed self-reported behaviors and SOC related to nutrition and PA. Participants in the BQ parent study signed written consent forms that included an agreement to participate in the phone survey in addition to the school-based activities of the BQ parent intervention.

The secondary research for this dissertation was granted Exempt status by Auburn University's Institutional Review Board, Protocol #20-452 EX 2009 (Appendix B). This study used a nonexperimental, cross-sectional design in which participants of the aforementioned phone survey were assigned to one of two groups based on their responses to questions about exposure to billboard messages. Responses from those who did not recall seeing any billboard messages were compared with responses from those who recalled at least one billboard message.

Campaign Development

Researchers conducted formative research to develop a campaign guided by social marketing principles. Initially, researchers gathered and reviewed demographic data describing Alabama's limited-resource population and examined federal and trusted national organizational reports on health behaviors of Alabamians as a whole and categorized demographically. Previous findings from focus groups with a similar target audience were reviewed to gain a baseline awareness of barriers and motivators to behaviors known to prevent obesity. State-level needs assessments indicated areas of highest need for intervention among Alabamians with low SES included increasing FV consumption, increasing PA, and decreasing SSB consumption. Previous social marketing literature highlighted mothers as the ideal target audience for campaign messages designed to increase FV consumption because of their role as nurturer and

their personal desires to keep their families healthy (Rekhy & McConchie, 2014). Others emphasized the opportunity to reach parents through social marketing activities centered around schools or combined with school-based activities (Evans et al., 2011). In this campaign, parents (primarily mothers) in the BQ intervention were targeted to remain consistent with these themes.

Prototypes of project logos, graphic art schemes, and campaign messages were developed for pretesting with focus groups and billboard campaign messages and graphics were adapted based on participant feedback. The final three mass media billboard designs promoted FV consumption, increasing water consumption as a means of decreasing SSB consumption, and walking for physical activity (Appendix C).

Campaign Implementation

The LWA billboard campaign ran for 12 weeks from January 1 through March 23, 2018 with billboard messages scheduled to display for four weeks each, starting with “Make Water Your Go-To Drink,” followed by “Have You Walked Today?,” and ending with “Have You Had a Fruit or Vegetable Today?.” To the greatest extent possible, billboard space was purchased in zip codes corresponding to schools where the BQ intervention was conducted. However, due to Alabama’s rural landscape and limited billboard availability, a few counties with schools participating in BQ did not receive billboards. Most counties without billboards had other outdoor signs and banners with the LWA messages to display around the county. The campaign included 64 billboards in 44 counties that drew an estimated 41 million impressions, or potential views, during the 12-week run.

In addition to billboards, the LWA social marketing campaign consisted of multiple delivery channels, including: 1) a campaign website, 2) social media accounts on Facebook, Twitter, and Pinterest, 3) a text messaging program, 4) branded recipe cards with accompanying

online videos, 5) branded educational handouts and reusable items such as water bottles, grocery bags, and sweat bands, and 6) signage in partnering organizations such as parks, walking trails, grocery stores, farmers markets, and schools. Trained SNAP-Ed county educators used these campaign materials to promote the LWA brand and messages at community outreach events such as nutrition education classes, special events, and food and physical activity access projects. These interpersonal nutrition education activities were conducted in various community settings during the time of the billboard campaign in counties with and without billboards.

Sample

This study used a convenience sample of parents ($n = 4,527$) who participated alongside their third-grade child in the statewide school-based obesity prevention initiative, BQ, during the 2018-2019 academic school year. SNAP-Ed educators in the 54 Alabama counties served by SNAP-Ed at Auburn University collected written informed consent from all participants following a protocol approved by the Auburn University Institutional Review Board. To be eligible, participants had to be at least 19 years of age, and be the primary caretaker of a third-grade child attending a SNAP-Ed eligible school in which 50% or more of students receive free or reduced price meals through the National School Lunch Program. Participants who provided written consent agreed to participate in a parent focused educational component of BQ. The parent intervention consisted of nutrition handouts, educational reinforcement items, and weekly text messages with health-related tips, many of which reinforced the LWA brand and campaign messages.

Relevant to this study, participants also agreed to participate in a brief phone survey near the end of the school year asking questions about eating healthy and being active. The exact nature of the phone survey was not described in relation to the LWA billboard campaign to avoid

leading participants to look for billboards and potentially increasing their chances of recall. A total of 366 surveys were completed.

The use of this convenience sample ensured that the intended target audience of the social marketing campaign (parents with low SES) was reached for the phone survey, since the BQ intervention was implemented only in schools where at least 50% of students are classified as living in low-income households. Notably, participants in the BQ parent intervention were assigned to treatment and control groups. Parents in the BQ treatment group received nutrition education materials promoting the LWA brand and messages during the time of the billboard campaign, whereas parents in the BQ control group did not receive materials during the time of the billboard campaign.

Instrumentation

Altarum, a nonprofit research and consulting organization with extensive experience in SNAP-Ed program evaluation, designed the survey for this study (Appendix D). Variations of it have been used by SNAP-Ed in other states to evaluate similar social marketing campaigns. Alabama Extension SNAP-Ed subject matter experts, including the primary researcher, collaborated with Altarum to adapt the survey to meet specific evaluation needs of the LWA campaign. The final version of the survey was approved by Auburn University's Institutional Review Board, Protocol #17-288 MR 1707.

The survey instrument included a combination of original campaign-specific questions and selected questions from validated instruments recommended for use in SNAP-Ed evaluations. Brand awareness was measured via aided or cued recall of LWA, "Have you heard of Live Well Alabama?" and unaided recall of any LWA delivery channels or community-based activities, "Where did you hear about Live Well Alabama?". The survey measured exposure to

LWA billboard messages via three aided recall questions with specific billboard messages provided verbally by the interviewer.

Several questions were included to describe the demographic and socioeconomic composition of the sample and for comparison with the dependent variable, exposure. Questions included age, gender, race, ethnicity, education level, household composition, and participation in government assistance programs. Self-rated health status was assessed with a question from the CDC's Behavioral Risk Factor Surveillance System. The question was posed, "Would you say that in general, your health is..." and measured with an ordinal response scale where participants ranked their health from 1, indicating "Poor," to 5, indicating "Excellent" (Hennessy, Moriarty, Zack, Scherr, & Brackbill, 1994). Three items from the U.S. Adult Food Security Survey Module were used to measure food security status (U.S. Department of Agriculture, 2016a). Participants were asked to indicate whether conditions indicative of food insecurity were "often true," "sometimes true," or "never true." These three items were treated as a scale for analysis. The Cronbach's alpha coefficient for the three items in the Food Security scale was .832, indicating good internal consistency.

All behavioral questions were selected to align with national SNAP-Ed Evaluation Framework indicators for measuring nutrition and physical activity behavior change, as is recommended for SNAP-Ed programming (Naja-Riese et al., 2019). Behavior questions measured the campaign's target behaviors of FV consumption, PA, and water in place of SSB consumption. Two questions from the University of California Cooperative Extension Food Behavior Checklist were adapted for phone survey usage to measure volume of FV consumption separately as the total amount of cups consumed each day (Townsend, Sylva, Martin, Metz, & Wooten-Swanson, 2008). Two SSB consumption behavior questions were selected from the

BEVQ-15 beverage intake questionnaire to measure frequency of soda and fruit drink consumption (Hedrick et al., 2012). An additional question from Share Our Strength's Cooking Matters for Adults Survey was used to measure frequency of water consumption (Pinard, Uvena, Quam, Smith, & Yaroach, 2015). The physical activity behavior question, "During the past week, how many days did you exercise when you breathed harder than normal for at least 30 minutes?," was recommended for use in SNAP-Ed by a multi-state Cooperative Extension workgroup (U.S. Department of Agriculture, 2016b).

The Transtheoretical Model (TTM) (Prochaska & DiClemente, 1983) was the basis for questions assessing participants' readiness to adopt two of the targeted behaviors promoted in campaign messages (FV consumption and PA). Readiness to change FV consumption was measured with two questions from Townsend Laboratory's Fruit and Vegetable Inventory about participants' intentions to increase consumption in the present, in the next 6 months, and in the next month (Townsend & Kaiser, 2007). Staging algorithms described by Townsend and Kaiser (2005) were used to assign participants to one of five SOC of the TTM based on combined responses to behavior (FV consumption) and readiness to change questions. Inclusion of behavior questions meant that for participants to be assigned to higher levels of the TTM, they would have to meet the DGA adult recommendations for fruits (two cups per day) and vegetables (two and a half cups per day) (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2020). Descriptions of the staging algorithm for FV consumption adapted from Townsend and Kaiser (2005) were as follows:

- Precontemplation: Reported eating less than 2 cups fruit or 2.5 cups vegetables a day on separate consumption questions and not thinking about eating more fruits and vegetables

- Contemplation: Currently eating less than 2 cups fruit or 2.5 cups vegetables a day and thinking about starting to eat more in the next 6 months
- Preparation: Currently eating less than 2 cups fruit or 2.5 cups vegetables a day and definitely planning to start eating more fruits or vegetables in the next month
- Action: Eating less than 2 cups fruit or 2.5 cups vegetables a day, thinking about eating more, and already trying to eat more fruits or vegetables
- Maintenance: Reported eating at least 2 cups fruit or 2.5 cups vegetables a day on separate consumption questions

Three physical activity questions were used to measure readiness to change for physical activity. The first asked how long participants had been getting the frequency of physical activity reported in the aforementioned behavior question. The remaining two asked if participants were interested in engaging in more physical activity in the next 6 months and in the next 30 days. These questions were designed based on the staging algorithm described by Nigg (2005), which was used in combination with the physical activity behavior question to assign participants to one of five SOC. Descriptions of the staging algorithm for physical activity adapted from Nigg (2005) were as follows:

- Precontemplation: Not regularly physically active (<3 days per week) and have no intention of becoming regularly physically active in the next 6 months
- Contemplation: Not regularly physically active (<3 days per week) but intend to become regularly physically active in the next 6 months
- Preparation: Not regularly physically active (<3 days per week) but intend to become regularly physically active in the 30 days
- Action: Regularly physically active (≥ 3 days per week) for fewer than 6 months

- Maintenance: Regularly physically active (≥ 3 days per week) for 6 months or more

Data Collection

The survey was administered using a computer assisted telephone interview system by trained interviewers at Market Decisions Research, a survey research firm experienced in conducting telephone surveys with a SNAP-Ed audience. Data collection took place from April 18 to June 23, 2018, after the billboard campaign ran for 12 weeks. Up to seven call attempts for each telephone number were made. The time of day and day of the week varied among call attempts to maximize response rate, with the exception of requested call backs. Soft refusals, busy signals, and hang ups were given a minimum of 72 hours before the next contact attempt.

A total of 366 surveys were completed. On average, respondents took 13 minutes to complete the survey. The survey response rate was 8%, with a respondent cooperation rate of 44% and a respondent refusal rate of 26% (The American Association for Public Opinion Research, 2016).

Data Analysis

Data were analyzed using IBM SPSS 26. Survey respondents were categorized into two groups, Exposed and Not Exposed, based on recall of billboard messages. These two groups comprised the dichotomous categorical variable, exposure. Respondents in the Exposed group recalled seeing at least one of the three billboard messages. Those in the Not Exposed group did not recall seeing any billboard messages. Exposure was treated as the independent variable, with target behaviors and SOC toward target behaviors as outcome variables.

Descriptive statistics were used to describe campaign exposure, brand awareness, demographics, self-rated health status, food security, and barriers to healthy eating and physical activity for the entire sample. Because a convenience sample of participants from the BQ

intervention was used in this study, chi-square tests of independence were conducted to test for a relationship between the two categorical variables of “BQ Group Assignment” (Treatment or Control) and “Exposure” (Exposed or Not Exposed). Chi-square tests of independence also were conducted to test for a relationship between the two categorical variables of “BQ Group Assignment” (Treatment or Control) and “Brand Awareness.” Following this step, chi-square tests and independent samples t-tests were used to analyze the relationship between the independent variable, exposure, and the outcome variables, behaviors and SOC, as well as demographics, health status, and food security status.

Summary

This chapter provided a detailed account of the methods used in this study. An overview of social marketing campaign development and implementation was provided and procedures for collecting data using a cross-sectional phone survey were detailed. Finally, an overview of data analysis was presented to provide context for the next chapter, where results will be presented.

Chapter 4

Results

Introduction

This chapter describes the results of the social marketing study introduced in Chapter 1. A literature review was presented in Chapter 2 that supported the methods of this study, which were described in Chapter 3.

Purpose of the Study

The purpose of this study was to examine the relationship between exposure to a targeted social marketing campaign and the campaign's target nutrition and physical activity behaviors among SNAP-Ed eligible parents in Alabama. The LWA campaign utilized numerous methods for building brand awareness and disseminating messages to the target audience, including mass media (e.g. billboards), social media, text messaging, branded recipe cards with accompanying online videos, and signage in partnering organizations (e.g. parks, walking trails, grocery stores, farmers markets, schools). The evaluation conducted for this study primarily concerned the largest component of LWA, a 12-week, statewide billboard campaign comprised of three messages promoting 1) FV consumption, 2) PA, and 3) water consumption.

Research Questions

This study attempted to answer the following research questions:

- 1) To what extent are the brand and messages for the targeted social marketing campaign, LWA, recognized by SNAP-Ed eligible adults?
- 2) To what extent are there differences in exposure to campaign messages by demographic and other characteristics of the SNAP-Ed eligible adult survey respondents?

- 3) Was the use of a convenience sample of BQ parent participants a confounding variable in this social marketing study?
- 4) What is the relationship between exposure to a targeted social marketing campaign and self-reported nutrition and PA behaviors of SNAP-Ed eligible adults?
- 5) What is the relationship between exposure to a targeted social marketing campaign and SOC related to FV consumption and PA among SNAP-Ed eligible adults?
- 6) What are the most commonly reported barriers to FV consumption and PA among SNAP-Ed eligible adults?

Demographic Results

This study used a convenience sample of parents who participated alongside their third-grade child in the statewide school-based obesity prevention initiative, BQ, during the 2018-2019 academic school year. The total number of adults who provided a phone number and consented to be contacted for the phone survey used in this study was 4,527. A total of 366 surveys were completed. The survey response rate was 8%, with a respondent cooperation rate of 44% and a respondent refusal rate of 26% (The American Association for Public Opinion Research, 2016).

Respondents identified their age, gender, race, ethnicity, and education level.

Demographic information for the sample can be found in Table 1. In general, the sample was predominantly female (89.6%) and between the ages of 25 and 44 (73.8%). The sample included primarily non-Hispanic (94.3%), white (56.6%), and Black (37.2%) respondents. Almost half (45.6%) had a high school diploma or less. The average number of children living in the household for the entire sample was 2.52 (SD 1.43).

Table 1

Frequencies and Percentages for Demographic Variables

<u>Characteristic</u>	<i>f</i>	<u>%</u>
Age in years		
18 – 34	137	37.4
35 – 44	137	37.4
≥ 45	91	24.9
NR	9	0.3
Gender		
Female	328	89.6
Male	35	9.6
NR	3	0.8
Race		
American Indian or Alaska Native	4	1.1
Black/African American	136	37.2
White/Caucasian	207	56.6
Other	10	2.7
NR	9	2.5
Ethnicity		
Hispanic or Latino	16	4.4
Non-Hispanic	345	94.3
NR	5	1.4
Education Level		
Less than high school	39	10.7
Graduated high school	128	35.0
Some college or vocational training	57	15.6
Vocational or technical college	52	14.2
College, 4-year	57	15.6
Graduate or Professional School	33	9.0

Note. (N = 366); NR = no response

In addition to demographics, respondents also identified their health status (poor, fair, good, very good, excellent, or unknown) (Hennessy et al., 1994). In this sample, 5.5% ($n = 20$) identified their health as poor, 19.1% ($n = 70$) as fair, 42.6% ($n = 156$) as good, 24.0% ($n = 88$)

as very good, 7.4% ($n = 27$) as excellent, and 1.4% ($n = 5$) did not know or were unsure. By comparison, 23.3% of Alabamians described their health as fair or poor according to 2017 BRFSS data using this item (Alabama Department of Public Health, 2017).

Respondents also answered three questions from the U.S. Adult Food Security Survey Module to estimate susceptibility to food insecurity under the least severe conditions. (U.S. Department of Agriculture, 2016a). Respondents were asked whether conditions indicative of food insecurity were “often true,” “sometimes true,” or “never true.” These three items were analyzed both individually and as a scale. For the scale, responses of “often true” or “sometimes true” were coded as affirmative and the sum of affirmative responses to the three questions made up the respondent’s raw score for food security. A raw score of 1 indicated a low level of food security, while a raw score of 3 indicated a high level of food security. The Cronbach’s alpha coefficient for the three-item food security scale was .832, indicating good internal consistency. The mean food security score for the sample was 2.47 (SD 0.63).

A dichotomous variable for food security also was created for which any respondent providing affirmative responses to all three questions was coded as food insecure, and all others were coded as food secure. In this sample, 24.5% ($n = 87$) as food insecure and 73.2% ($n = 268$) were classified as food secure.

Respondents also reported participation in government assistance programs, such as SNAP/Electronic Benefits Transfer (EBT), Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Medicaid, and others. The most commonly reported programs were free or reduced-price school lunch or breakfast (58.7%), Medicaid (54.6%), and SNAP/EBT (40.4%). Approximately three-fourths (72.2%) of respondents reported participation in at least one government assistance program. Participation frequency by program is listed in Table 2.

Table 2

Participation in Government Assistance Programs (N = 366)

Government Assistance Program	<i>f</i>	<i>%</i>
SNAP/EBT (food stamps)	148	40.4
WIC	44	12.0
Free or reduced-price school meals	215	58.7
Free summer meals	40	10.9
Head Start	19	5.2
Food Pantry	28	7.6
Medicaid	200	54.6
Did not participate in any programs	99	27.0
NR	3	0.8

Note. NR = no response

Research Question 1

Research Question 1: To what extent are the brand and messages for the targeted social marketing campaign, LWA, recognized by SNAP-Ed eligible adults?

Brand Awareness

Respondents ($n = 338$) answered the brand awareness question, “Have you heard of Live Well Alabama?” Overall awareness of LWA among those who responded was 29.3%. As a follow-up question, respondents reporting awareness of LWA were asked to identify the delivery channels through which they encountered the brand. Of those who recalled LWA ($n = 99$), 27 respondents (27.3%) identified more than one delivery channel. The highest number of delivery channels reported by any single respondent was eight. The delivery channels identified by the highest percentage of respondents were school or summer programs for children (54.5%), billboards, banners or signs (30.3%), and social media (27.3%). Figure 1 displays delivery channels in order of popularity. Of respondents who were aware of LWA, 31 (31.3%) did not recall seeing any of the three billboard messages.

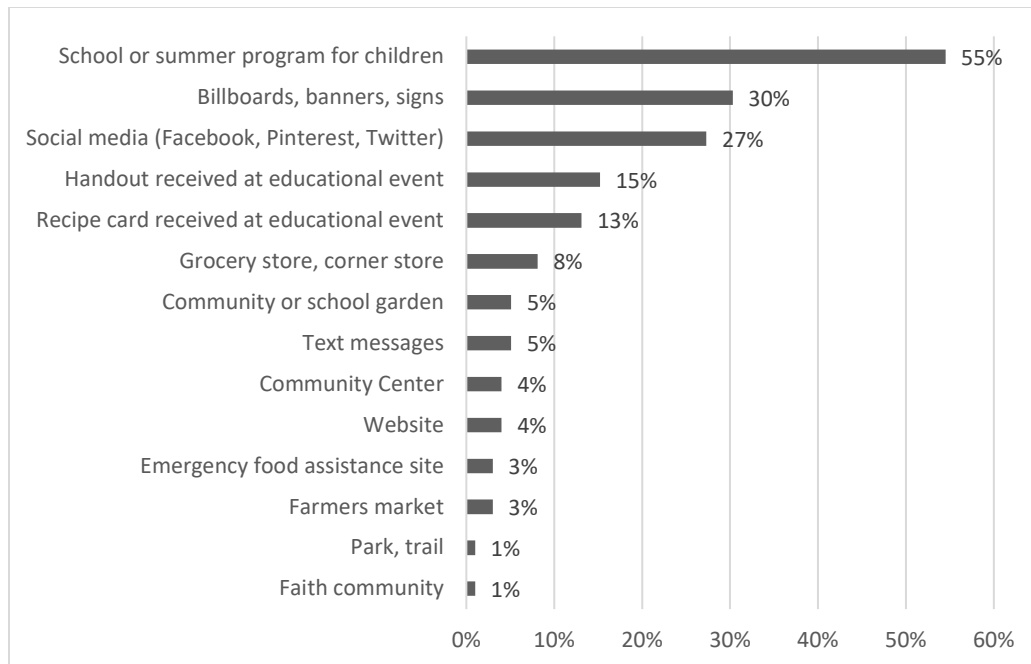


Figure 1. Where respondents encountered Live Well Alabama. Respondents ($n = 366$) could select multiple delivery channels.

There was a significant association of medium to large effect between brand awareness and education level ($\chi^2(2, N = 338) = 39.92, p < .001, V = .34$). Respondents with at least some college were significantly more likely to be aware of LWA than respondents with a high school diploma or less ($\chi^2(1, N = 338) = 22.64, p < .001$). This association had a small to medium effect ($\phi = .26$). There was a significant association of small to medium effect between brand awareness and self-identified health status ($\chi^2(1, N = 333) = 4.98, p = .026, \phi = .20$). Respondents indicating their health was “good,” “very good” and “excellent” were significantly more likely to be aware of LWA than respondents with “fair” or “poor” health ($\chi^2(1, N = 333) = 4.57, p = .033$), though the effect was small ($\phi = .12$). There was a significant association of small to medium effect between brand awareness and participation in government assistance programs. Respondents who did not receive assistance were significantly more likely to be aware of LWA than respondents participating in one or more program ($\chi^2(1, N = 335) = 16.54, p <$

.001). This association had a small to medium effect ($\phi = .22$). There also was a significant association of small effect between brand awareness and food security status ($\chi^2(1, N = 327) = 6.43, p = .011, \phi = .14$). Food secure respondents were significantly more likely to be aware of LWA. There were no significant differences in brand awareness related to age, race, or gender. Differences in brand awareness by demographic variables, self-reported health status, government assistance program participation, and food security are summarized in Table 3.

Table 3

Differences in Brand Awareness

<u>Characteristic</u>	<u>Aware</u>	<u>Not Aware</u>	<u>Chi Square Test of Independence</u>
Age in years <i>n (%)</i>			
18 – 44	31 (24.0)	98 (76.0)	$\chi^2(2, N = 338) = 3.02$ $p = .221$ $V = .10$
35 – 44	40 (31.7)	86 (68.3)	
≥ 45	28 (34.1)	54 (65.9)	
Gender <i>n (%)</i>			
Female	90 (29.6)	214 (70.4)	$\chi^2(1, N = 335) = .004$ $p = .947$ $\phi = .00$
Male	9 (29.0)	22 (71.0)	
Race <i>n (%)</i>			
Black	31 (23.5)	101 (76.5)	$\chi^2(2, N = 330) = 5.178$ $p = .075$ $V = .13$
White	64 (34.8)	120 (65.2)	
Other/Multiple	3 (21.4)	11 (78.6)	
Education Level, 3 groups <i>n (%)</i>			
High school or less	25 (16.3)	128 (83.7)	$\chi^2(2, N = 338) = 39.92$ $p < .001^*$ $V = .34$
Some college	28 (27.5)	74 (72.5)	
College grad or higher	46 (55.4)	37 (44.6)	
Education Level, 2 groups <i>n (%)</i>			
High school or less	25 (16.3)	128 (83.7)	$\chi^2(1, N = 338) = 22.64$ $p < .001^*$ $\phi = .26$
Some college or higher	74 (40.0)	111 (60.0)	

Note: *Statistically significant, ϕ = Phi coefficient effect size, V = Cramer's V effect size.

Table 3, continued

Differences in Brand Awareness

<u>Characteristic</u>	<u>Aware</u> <u>N = 99</u>	<u>Not Aware</u> <u>N = 238</u>	<u>Chi Square Test of</u> <u>Independence</u>
Health Status, 5 groups <i>n</i> (%)			
Excellent	5 (20.8)	19 (79.2)	$\chi^2(1, N = 333) = 4.98$ $p = .026^*$ $\phi = .20$
Very good	37 (44.6)	46 (55.4)	
Good	39 (27.5)	103 (72.5)	
Fair	14 (20.6)	54 (79.4)	
Poor	3 (18.8)	13 (81.3)	
Health Status, 2 groups <i>n</i> (%)			
Excellent to good	81 (32.5)	168 (67.5)	$\chi^2(1, N = 333) = 4.57$ $p = .033^*$ $\phi = .12$
Fair to poor	17 (20.2)	67 (79.8)	
Government Assistance Program Participation <i>n</i> (%)			
One or more program	57 (23.4)	187 (76.6)	$\chi^2(1, N = 335) = 16.54$ $p < .001$ $\phi = .22$
No programs	42 (46.4)	49 (53.8)	
Food security status <i>n</i> (%)			
Food secure	82 (32.9)	167 (67.1)	$\chi^2(1, N = 327) = 6.43$ $p = .011$ $\phi = .14$
Food insecure	14 (17.9)	64 (82.1)	

Note: *Statistically significant, ϕ = Phi coefficient effect size, V = Cramer's V effect size.

Exposure

Respondents were categorized into two groups, Exposed and Not Exposed, based on self-reported recall of billboard messages. Recall was determined using three questions, each specific to a billboard message. The questions were as follows:

- Have you seen any billboards promoting the importance of eating more fruits and vegetables with the message, “Have you had a fruit or vegetable today?”?
- Have you seen any billboards promoting the importance of getting more physical activity or exercise with the message, “Have you walked today?”?

- Have you seen any billboards promoting the importance of drinking more water with the message, “Make water your go-to drink.”?

Respondents in the Exposed group ($n = 185$) recalled seeing at least one of the three billboard messages. The Not Exposed ($n = 181$) group included those who did not confirm recall of any of the three billboard messages. Overall, 50.5% ($n = 185$) of the total sample recalled exposure to at least one billboard message, while 49.5% ($n = 181$) were not exposed to any billboard messages. The billboard message with the highest reported recall was “Have you had a fruit or vegetable today?” with 41.5% ($n = 152$) of respondents in the Exposed group recalling this message. Frequencies and percentages of exposure to billboard messages are displayed in Table 4.

Table 4.

Frequencies and Percentages of Exposure by Message (N = 366)

Billboard Message	<i>f</i>	%
Have you had a fruit or vegetable today?	152	41.5
Make water your go-to drink.	93	25.4
Have you walked today?	57	15.6

Research Question 2

Research Question 2: To what extent are there differences in exposure by demographic and other characteristics of the SNAP-Ed eligible adult survey respondents?

Exposure, a dichotomous categorical variable, was treated as the independent variable in a series of chi-square tests to analyze relationships between exposure and demographics, health status, participation in government assistance programs, and food security status. There were no significant relationships between exposure and any of the following demographic descriptors: age, gender, race, or education level. There was a significant association of small to

medium effect between exposure and health status ($\chi^2(1, N = 361) = 7.78, p < 0.005, \phi = .21$). Respondents indicating their health was “good,” “very good” and “excellent” were significantly more likely to have been exposed than respondents with “fair” or “poor” health ($\chi^2(1, N = 361) = 6.37, p = 0.012$), though the effect was small ($\phi = .13$). There was no significant association between exposure and government assistance program participation or food security. Differences in exposure by demographic variables, self-reported health status, government assistance program participation, and food security are summarized in Table 5.

Table 5

Differences in Exposure

<u>Characteristic</u>	<u>Exposed</u>	<u>Not Exposed</u>	<u>Chi Square Test of Independence</u>
Age in years <i>n (%)</i>			
18 – 44	64 (46.7)	73 (53.3)	$\chi^2(2, N = 365) = 1.77$ $p = .413$ $V = .07$
35 – 44	75 (54.7)	62 (45.3)	
≥ 45	46 (50.5)	45 (49.5)	
Gender <i>n (%)</i>			
Female	167 (50.9)	161 (49.1)	$\chi^2(1, N = 363) = .069$ $p = .792$ $\phi = .01$
Male	17 (48.6)	18 (51.4)	
Race <i>n (%)</i>			
Black	74 (54.8)	61 (45.2)	$\chi^2(2, N = 357) = 2.40$ $p = .301$ $V = .08$
White	100 (48.5)	106 (51.5)	
Other/Multiple	6 (37.5)	10 (62.5)	
Education Level <i>n (%)</i>			
High school or less	87 (52.1)	80 (47.9)	$\chi^2(2, N = 366) = 2.91$ $p = .233$ $V = .09$
Some college	48 (44.0)	61 (56.0)	
College grad or higher	50 (55.6)	40 (44.4)	

Note: *Statistically significant, ϕ = Phi coefficient effect size, V = Cramer's V effect size.

Table 5, continued

Differences in Exposure, continued

<u>Characteristic</u>	<u>Exposed</u>	<u>Not Exposed</u>	<u>Chi Square Test of Independence</u>
Health Status, 5 groups <i>n</i> (%)			
Excellent	12 (44.4)	15 (55.6)	$\chi^2(1, N = 361) = 7.78$ $p = .005^*$ $\phi = .21$
Very good	57 (64.8)	31 (35.2)	
Good	78 (50.0)	78 (50.0)	
Fair	31 (44.3)	39 (55.7)	
Poor	4 (20.0)	16 (80.0)	
Health Status, 2 groups <i>n</i> (%)			
Excellent to good	147 (54.2)	124 (45.8)	$\chi^2(1, N = 361) = 6.37$ $p = .012^*$ $\phi = .13$
Fair to poor	35 (38.9)	55 (61.1)	
Government Assistance Program Participation <i>n</i> (%)			
One or more program	136 (51.5)	128 (48.5)	$\chi^2(1, N = 363) = .265$ $p = .607$ $\phi = .03$
No programs	48 (48.4)	51 (51.5)	
Food security status <i>n</i> (%)			
Food secure	135 (52.9)	133 (49.6)	$\chi^2(1, N = 355) = .277$ $p = .599$ $\phi = .03$
Food insecure	41 (47.1)	46 (52.9)	

Note: *Statistically significant, ϕ = Phi coefficient effect size, V = Cramer's V effect size.

Research Question 3

Research Question 3: Was the use of a convenience sample of BQ parent participants a confounding variable in this social marketing study?

This study used a convenience sample of parents who participated alongside their third-grade child in the statewide school-based obesity prevention initiative, BQ, during the 2018-2019 academic school year. Participants in the BQ parent intervention were assigned to treatment and control groups. Parents in the BQ treatment group could have received nutrition education materials promoting the LWA brand and messages during the time of the billboard campaign, whereas parents in the BQ control group did not receive materials during the time of the billboard campaign.

A chi-square test of independence was performed to examine the relationship between the BQ group assignment (Treatment or Control) and exposure to billboard messages (Exposed or Not Exposed). The relationship between these variables was not significant, ($\chi^2(1, N = 366) = .67, p = .414$). Additionally, a chi-square test of independence was performed to examine the relationship between BQ group assignment (Treatment or Control) and brand awareness. The relationship between these variables was not significant, ($\chi^2(1, N = 338) = .65, p = .420$). The group assignment for the BQ intervention was not related to billboard messages or brand awareness. Therefore, the use of a convenience sample of BQ parents did not confound the results of this study.

Research Question 4

Research Question 4: What is the relationship between exposure to a targeted social marketing campaign and self-reported nutrition and PA behaviors of SNAP-Ed eligible adults?

Exposure, a dichotomous categorical variable, was treated as the independent variable in a series of chi-square tests and independent samples t-tests to analyze relationships between exposure and outcome variables related to the campaign's target behaviors including FV consumption, water in place of SSB consumption, and PA. Differences in behaviors related to exposure are displayed in Table 6.

Fruit and Vegetable Consumption

Fruit and vegetable consumption were measured with two separate items in which respondents identified the number of cups of each consumed each day. The average number of cups of fruits consumed per day for the sample was 1.49 cups (*SD* 0.98). The average number of cups of vegetables consumed per day was 1.64 cups (*SD* 0.90).

To examine relationships between fruit consumption and other variables, responses were recoded into 4 ranked categories: Less than 1 cup, 1 to 1.5 cups, 2 to 2.5 cups, and 3 cups or more. There were significant differences with small to medium effects in fruit consumption based on exposure ($\chi^2(1, N = 348) = 8.10, p = .004, \phi = .17$), race ($\chi^2(1, N = 340) = 11.32, p = .001, \phi = .20$), and participation in assistance programs ($\chi^2(1, N = 345) = 4.16, p = .041, \phi = .12$). There were no significant differences in vegetable consumption within the sample.

Water and Sugar-sweetened Beverage Consumption

The majority of respondents (72.4%) reported drinking a glass or bottle of water three or more times per day. When asked about SSB consumption, 41.0% of respondents reported drinking regular (non-diet) soda “never or less than one time per week” and 38.5% reported

drinking SSB such as sweet tea, Kool-Aid, cranberry drink, or lemonade “never or less than one time per week. On the other hand, 28.4% reported drinking regular soda one or more times per day and 30.9% reported drinking other SSB one or more times per day.

To examine relationships between water consumption and other variables, responses were recoded into 4 ranked categories: “Never or less than one time per week,” “1 to 3 times per week,” “4 to 7 times per week,” and “2 or more times per day.” There was a significant relationship of small to medium effect between water consumption and exposure ($\chi^2(1, N = 365) = 10.54, p = .001, \phi = .21$); education level ($\chi^2(1, N = 365) = 6.73, p = .009$), though effect was small ($\phi = .12$); and food security status ($\chi^2(1, N = 354) = 6.23, p = .0130$), which also had a small effect ($\phi = .13$).

There was a significant association of small effect between SSB consumption and food security status. This was the case for sodas ($\chi^2(1, N = 355) = 7.82, p = .005, \phi = .17$) and other SSB including sweet tea, Kool-Aid, cranberry drink, and lemonade ($\chi^2(1, N = 354) = 7.10, p = .008, \phi = .17$). There was also a significant association of small to medium effect between soda consumption and participation in government assistance programs ($\chi^2(1, N = 363) = 24.68, p < .001, \phi = .26$) and education level ($\chi^2(1, N = 366) = 18.65, p < .001$), though effect was small ($\phi = .17$). Similarly, there were significant association of small effect between other SSB consumption and participation in government assistance programs ($\chi^2(1, N = 362) = 5.89, p = .015, \phi = .15$) and education level ($\chi^2(1, N = 365) = 5.77, p = .016, \phi = .13$). However, there was no significant relationship between exposure and SSB consumption of either type.

Physical Activity

The average number of days respondents reported exercising for at least 30 minutes was 3.01 (SD 2.46). The number of days most frequently reported was zero (21.9%), followed by 3

(16.9%) and 2 (15.0%). An independent samples t-test was conducted to compare the number of days per week (0 – 7 days) respondents reported being physically active for the exposed and not exposed groups. There was not a significant difference in the mean number of days of exercise for those in the exposed group ($M = 3.14$, $SD = 2.46$) and the not exposed group ($M = 2.87$, $SD = 2.47$); $t(364) = -1.06$, $p = 0.29$).

Responses to the PA question were recoded into categorical data to analyze relationships between PA and demographic variables. Respondents were separated into two groups, those who reported five or more days of PA for at least 30 minutes and those who reported zero to four days of PA for at least 30 minutes. Five days was used as the minimum for the higher PA group since the Physical Activity Guidelines for Americans recommends adults get 150 minutes of moderate to vigorous exercise per week, which equates to 30 minutes a day for five days a week (U.S. Department of Health and Human Services, 2018). There remained no significant difference in PA between exposed and not exposed groups. Respondents who identified themselves as males were significantly more likely to be in the higher PA group than females ($\chi^2(1, N = 357) = 4.30$, $p = .038$), but the effect was small ($\phi = .11$). There were no other significant differences within the sample related to amount of weekly PA.

Actions Taken Following Exposure

Respondents in the exposed group ($n = 185$) and those who were aware of LWA despite not having seen a billboard ($n = 31$) were asked if seeing any of the healthy eating messages led them to take action. A total of 216 respondents answered this question by identifying from a list of several options any actions they had taken. More than half (57.9%) of respondents reported at least one new action. Of those who reported taking action ($n = 125$), 92 respondents (73.6%) identified more than one recent action. The highest number of actions taken reported by any

single respondent was 10. The most commonly reported actions were eating more FV (35.6%). Figure 2 displays actions taken in order of popularity. Of respondents who were asked this question ($n = 216$), 80 (21.9%) reported taking no new actions since seeing the messages, and 11 (3.0%) did not know or were not sure if they had taken any new actions since seeing messages.

Table 6

Differences in Behaviors Related to Exposure

<u>Behavior</u>	<u>Exposed</u>	<u>Not Exposed</u>	<u>Chi Square Test of Independence</u>
Fruit consumption			
Less than 1 cup	30 (37.5)	50 (62.5)	$\chi^2(1, N = 348) = 8.01$ $p = .004^*$ $\phi = .17$
1 to 1.5 cups	63 (50.8)	61 (49.2)	
2 to 2.5 cups	43 (58.9)	30 (41.1)	
3 cups or more	42 (59.2)	29 (40.8)	
Vegetable consumption			
Less than 1 cup	26 (44.1)	33 (55.9)	$\chi^2(1, N = 355) = 3.47$ $p = .062$ $\phi = .12$
1 to 1.5 cups	54 (45.0)	66 (55.0)	
2 to 2.5 cups	62 (56.9)	47 (43.1)	
3 cups or more	37 (55.2)	30 (44.8)	
Water consumption			
Never/ less than 1 time/week	2 (25.0)	6 (75.0)	$\chi^2(1, N = 365) = 10.54$ $p = .001^*$ $\phi = .21$
1 to 3 times/week	5 (35.7)	9 (64.3)	
4 to 7 times/week	8 (23.5)	26 (76.5)	
2 or more times/day	169 (54.7)	140 (45.3)	
Regular soda consumption			
Never/ less than 1 time/week	71 (47.3)	79 (52.7)	$\chi^2(1, N = 366) = 0.04$ $p = .841$ $\phi = .12$
1 to 3 times/week	62 (59.0)	43 (41.0)	
4 to 7 times/week	20 (47.6)	22 (52.4)	
2 or more times/day	32 (46.4)	37 (53.6)	
Other SSB consumption			
Never/ less than 1 time/week	70 (49.6)	71 (50.4)	$\chi^2(1, N = 366) = 0.04$ $p = .837$ $\phi = .06$
1 to 3 times/week	51 (51.5)	48 (48.5)	
4 to 7 times/week	32 (56.1)	25 (43.9)	
2 or more times/day	31 (45.6)	37 (54.4)	

Note: *Statistically significant, $\phi =$ Phi coefficient effect size

Table 6, continued

Differences in Behaviors Related to Exposure

<u>Behavior</u>	<u>Exposed</u>	<u>Not Exposed</u>	<u>Chi Square Test of Independence</u>
Physical Activity			
0 to 4 days	136 (50.6)	133 (49.4)	$\chi^2 (1, N = 360) = 0.00$
5 to 7 days	46 (50.5)	45 (49.5)	$p = .999$
			$\phi = .00$

Note: *Statistically significant, ϕ = Phi coefficient effect size

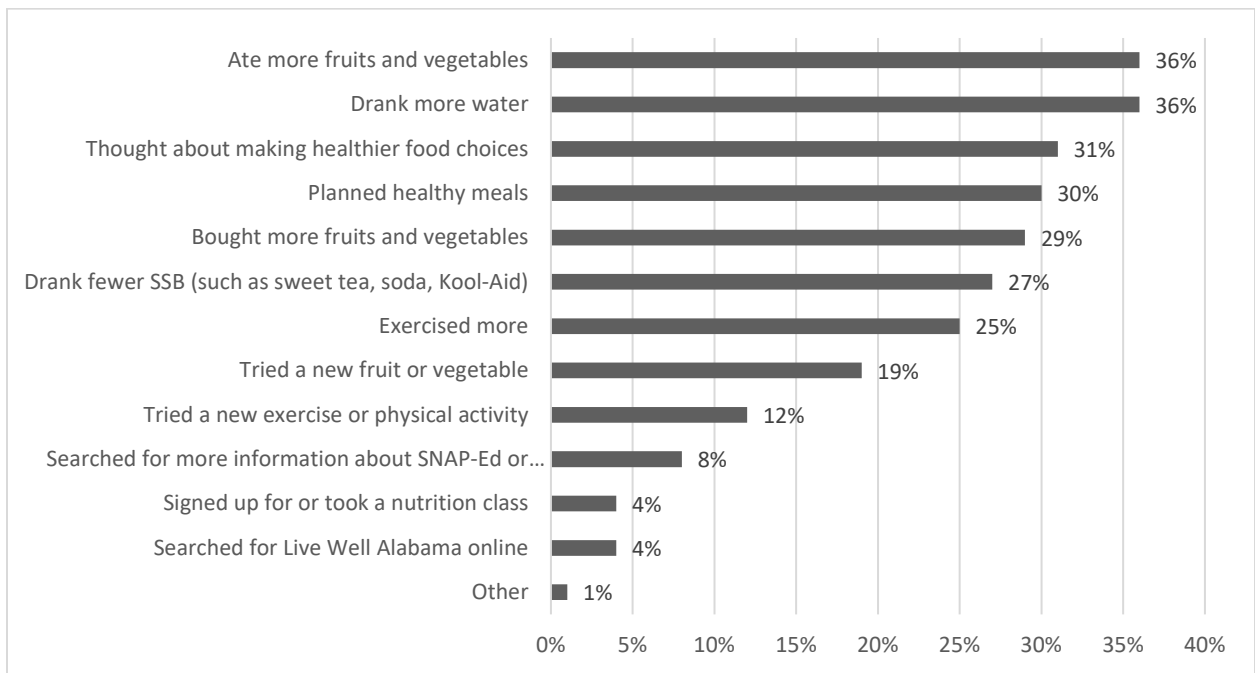


Figure 2. Actions taken after seeing Live Well Alabama messages. Respondents ($n = 216$) could indicate more than one action.

Research Question 5

Research Question 5: What is the relationship between exposure to a targeted social marketing campaign and SOC related to FV consumption and PA among SNAP-Ed eligible adults?

Staging algorithms described by Townsend and Kaiser (2005) were used to assign participants to one of five SOC of the TTM based on combined responses to behavior (fruit consumption and vegetable consumption) and readiness to change questions. A similar model was used to assign participants to SOC for PA (Nigg, 2005). Chi-square tests of independence were performed to examine the relationships between exposure and respondents' assigned stage of change toward increasing fruit consumption, vegetable consumption, and PA. Figure 3 displays respondents classified into SOC for FV consumption and PA. Differences in SOC related to exposure are displayed in Table 7.

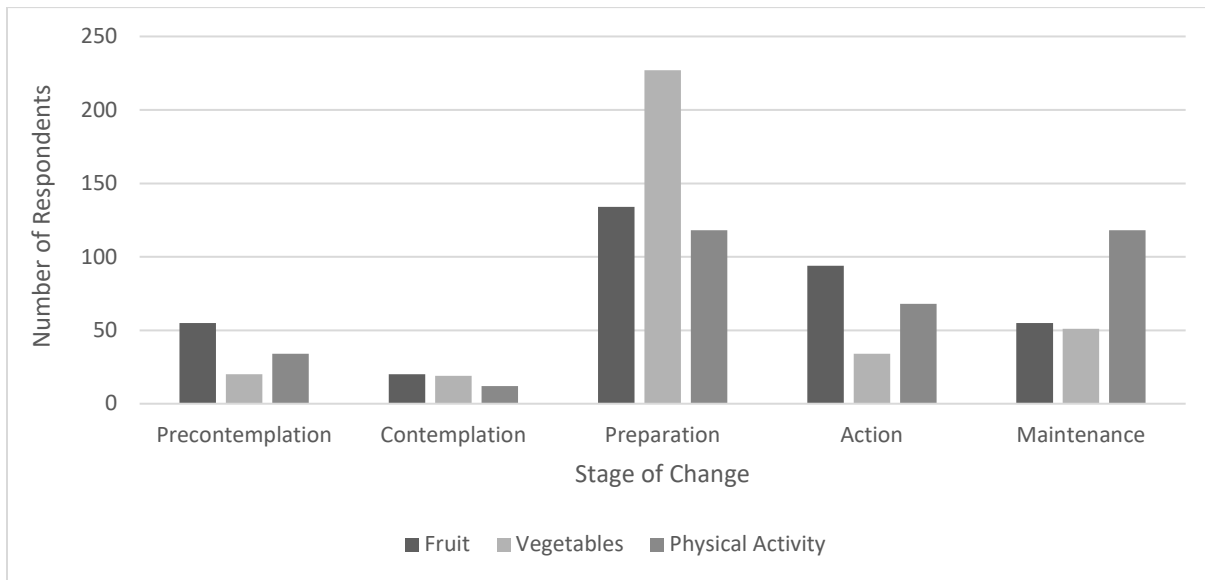


Figure 3. Stages of change for fruit, vegetables, and physical activity. This figure displays the number of respondents classified into each of the five stages of change for fruit consumption, vegetable consumption, and physical activity.

Stages of Change for Fruit Consumption

Of respondents who provided responses to all questions necessary for stage of change assignment for fruit consumption ($n = 358$), slightly more than one third (37.4%) were in the preparation stage and about one fourth (26.3%) were in the action stage. There was a significant association of small effect between exposure and stage of change for fruit consumption ($\chi^2(1, N = 358) = 9.59, p = .002, \phi = .13$). Respondents who were exposed were significantly more likely to be in the “action” or “maintenance” stages than those who were not exposed ($\chi^2(1, N = 358) = 6.00, p = .014$), though effect was small ($\phi = .13$).

Stages of Change for Vegetable Consumption

Of respondents who provided responses to all questions necessary for stage of change assignment for vegetable consumption ($n = 351$), nearly two thirds (64.7%) were in the preparation stage. There was not a significant association between exposure and stage of change for vegetable consumption ($\chi^2(1, N = 351) = 1.32, p = .250$).

Stages of Change for Physical Activity

Of respondents who provided responses to all questions necessary for stage of change assignment for PA ($n = 350$), slightly more than one third (33.7%) were in the preparation stage and the same amount (33.7%) were in the maintenance stage. There was a significant association of small effect between exposure and stage of change for PA ($\chi^2(1, N = 350) = 4.09, p = .043, \phi = .16$). Respondents who were exposed were more likely to be in the “action” or “maintenance” stages than those who were not exposed, although the result of this follow-up analysis was not significant ($\chi^2(1, N = 350) = 3.34, p = .068$).

Table 7

Differences in Stages of Change Related to Exposure

<u>Stage of Change</u>	<u>Exposed N = 185</u>	<u>Not Exposed N = 181</u>	<u>Chi Square Test of Independence</u>
Fruit consumption, 5 groups			
Precontemplation	21 (38.2)	34 (61.8)	$\chi^2(1, N = 358) = 89.59$ $p = .002^*$ $\phi = .17$
Contemplation	7 (35.0)	13 (65.0)	
Preparation	68 (50.7)	66 (49.3)	
Action	53 (56.4)	41 (43.6)	
Maintenance	35 (63.6)	20 (36.4)	
Fruit consumption, 2 groups			
Early Stages ^a	96 (45.9)	113 (54.1)	$\chi^2(1, N = 358) = 6.00$ $p = .014^*$ $\phi = .13$
Late Stages ^b	88 (59.1)	61 (40.9)	
Vegetable consumption			
Precontemplation	8 (40.0)	12 (60.0)	$\chi^2(1, N = 351) = 1.32$ $p = .250$ $\phi = .09$
Contemplation	8 (42.1)	11 (57.9)	
Preparation	118 (52.0)	109 (48.0)	
Action	20 (58.8)	14 (41.2)	
Maintenance	27 (52.9)	24 (47.1)	
Physical Activity			
Precontemplation	11 (32.4)	23 (67.6)	$\chi^2(1, N = 350) = 4.09$ $p = .043^*$ $\phi = .16$
Contemplation	4 (33.3)	8 (66.7)	
Preparation	58 (49.2)	60 (50.8)	
Action	41 (60.3)	27 (39.7)	
Maintenance	60 (50.8)	58 (49.2)	
Physical Activity, 2 groups			
Early Stages ^a	73 (44.5)	91 (55.5)	$\chi^2(1, N = 350) = 3.34$ $p = .068$ $\phi = .10$
Late Stages ^b	101 (49.7)	85 (45.7)	

Note: *Statistically significant, ϕ = Phi coefficient effect size. ^aPrecontemplation, contemplation or preparation. ^bAction or maintenance.

Research Question 6

Research Question 6: What are the most commonly reported barriers to FV consumption and PA among SNAP-Ed eligible adults?

Respondents were asked the following three questions about barriers to behavior change:

- What are the main reasons why you do not eat more vegetables?
- What are the main reasons why you do not eat more fruits?
- What are the main reasons why you do not engage in more PA or exercise currently?

Barriers to Vegetable Consumption

The most commonly reported barriers to eating more vegetables were that respondents felt they were too busy to eat vegetables (24.3%), and respondents do not like vegetables (16.1%). About one in ten respondents perceived that they already ate enough vegetables (12.0%) and that vegetables were too expensive (9.8%). Figure 4 displays information on these and other barriers indicated by respondents.

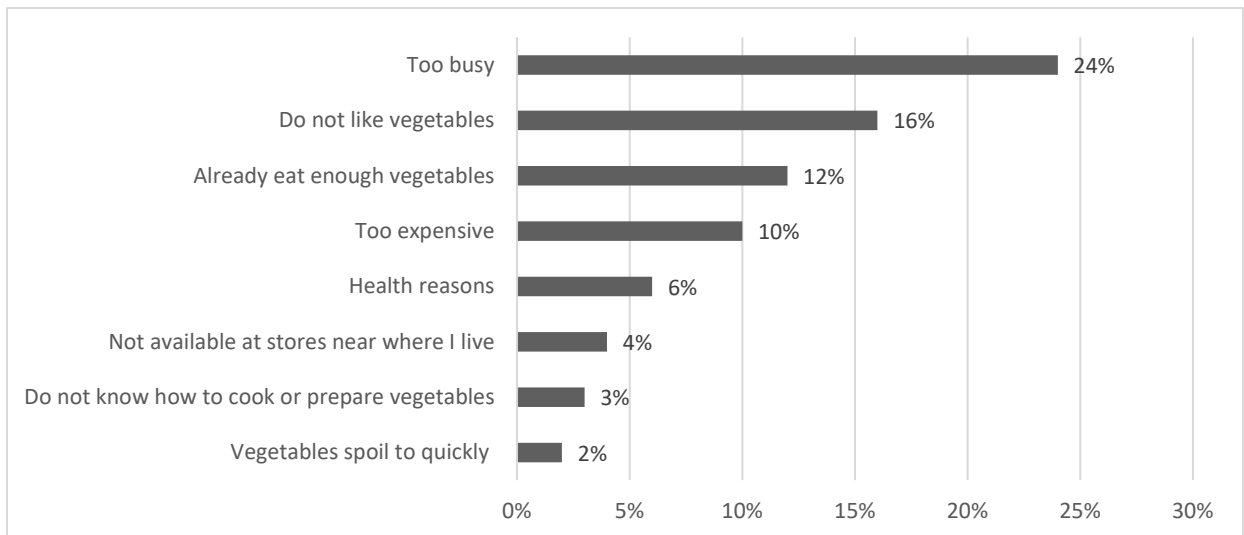


Figure 4. Barriers to vegetable consumption. This figure displays the barriers mentioned in order of frequency. Respondents ($n = 366$) could indicate more than one barrier.

Barriers to Fruit Consumption

The most commonly reported barriers to eating more fruits were that respondents felt fruits were too expensive (16.1%), they do not like fruits (12.8%), and they were too busy to eat fruits (12.8%). Compared to vegetables, fewer respondents perceived that they already ate enough fruits (14.8%). Figure 5 displays information on these and other barriers indicated by respondents.

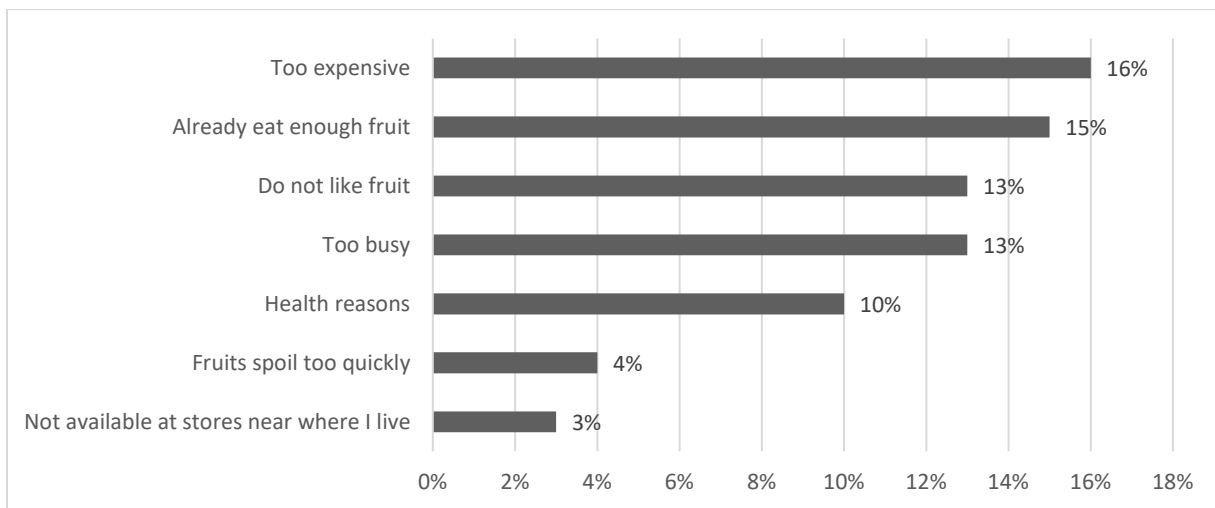


Figure 5. Barriers to fruit consumption. This figure displays the barriers mentioned in order of frequency. Respondents ($n = 366$) could indicate more than one barrier.

Barriers to Physical Activity

Finally, the primary barrier to PA was that respondents felt they were too busy or did not have enough time (53.5%). Other common barriers mentioned poor physical health that prevented PA (16.7%) and lack of available childcare (7.7%). Slightly more than one in ten respondents (11.7%) believed they already exercised enough. Figure 6 displays information on these and other barriers indicated by respondents.

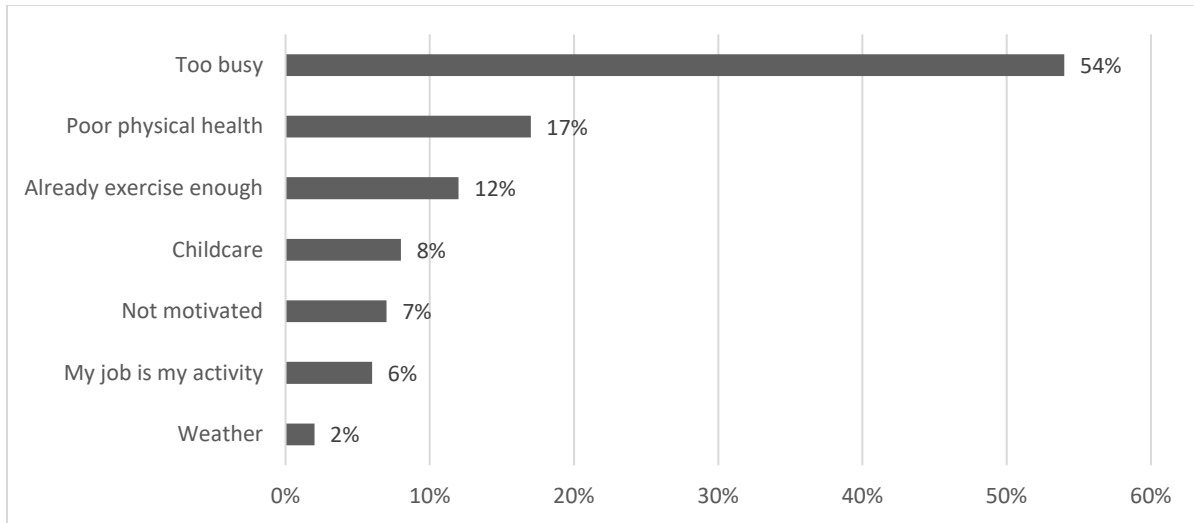


Figure 6. Barriers to physical activity. This figure displays the barriers mentioned in order of frequency. Respondents ($n = 366$) could indicate more than one barrier.

Summary

Recalled exposure to billboard messages was more common than awareness of the LWA brand in this multi-component social marketing study. In fact, a slight majority of the sample (50.5%) reported seeing at least one billboard during the 12-week outdoor advertising campaign, while 29.3% confirmed awareness of the brand. Although a convenience sample of BQ parents was used for this study, there was no evidence of a confounding relationship between BQ group (treatment or control) and either brand awareness or billboard exposure.

When compared to respondents who did not recall billboards, exposed respondents were more likely to report better health, engage in healthier behaviors, and identify with the higher end of the SOC continuum. Specifically, exposed respondents reported significantly higher fruit and water consumption levels, and were significantly more likely to be in action or maintenance stages for fruit consumption and physical activity than their unexposed counterparts. Though effect sizes in this study were generally small, this phenomena is documented commonly in

social marketing literature (Evans, Renaud, et al., 2007; Price et al., 2008). Snyder et al. (2004) reported that small effect sizes were common across campaigns included in a meta-analysis, but pointed out that small effects can be tangible and can affect large numbers of people in a population and significantly impact public health.

Due to limitations in the nonexperimental study design, it cannot be determined whether respondents' behavior and SOC were affected by the social marketing campaign or if respondents had been practicing the campaign's target behaviors prior to exposure. However, a substantial number of respondents who had seen billboards and/or recognized the LWA brand self-reported changing their behavior after encountering the campaign messages. Eating more FV and drinking more water were the most commonly reported actions, each selected by more than one-third of respondents.

Among the most commonly reported barriers to the campaign's target behaviors of FV consumption and physical activity were being too busy, not liking or already eating enough FV, the expense of FV, and poor physical health. Despite these barriers, the majority of respondents were in the preparation stage or higher for changing FV consumption and physical activity behaviors, indicating a general awareness of a need for change and an openness to education and support. Considering the findings related to exposure and behavior and the additional affirmation of self-reported behavior change after seeing campaign messages, this evaluation of the LWA social marketing campaign yielded promising insights into the reach and potential effects among the target population and that warrants continued campaign implementation and evaluation.

Chapter 5

Summary, Conclusions, Implications, and Recommendations

Introduction

The final chapter provides a review of the purpose of this study and brief summary of findings before comparing and contrasting with other findings from previous research. A larger discussion follows of the significance and implications of this study for the future of the LWA campaign. The dissertation is brought to and with recommendations for future research to advance the field of social marketing within a community nutrition context.

Purpose of the Study

The purpose of this study was to examine the relationship between exposure to a targeted social marketing campaign and the campaign's target nutrition and physical activity behaviors among SNAP-Ed eligible parents in Alabama. The LWA campaign utilized numerous methods for building brand awareness and disseminating messages to the target audience, including mass media (e.g. billboards), social media, text messaging, branded recipe cards with accompanying online videos, and signage in partnering organizations (e.g. parks, walking trails, grocery stores, farmers markets, schools). The evaluation conducted for this study primarily concerned the largest component of LWA, a 12-week, statewide billboard campaign comprised of three messages promoting 1) FV consumption, 2) PA, and 3) water consumption.

Research Questions

This study attempted to answer the following research questions:

- 1) To what extent are the brand and messages for the targeted social marketing campaign, LWA, recognized by SNAP-Ed eligible adults?

- 2) Was the use of a convenience sample of BQ parent participants a confounding variable in this social marketing study?
- 3) To what extent are there differences in exposure by demographic and other characteristics of the SNAP-Ed eligible adult survey respondents?
- 4) What is the relationship between exposure to a targeted social marketing campaign and self-reported nutrition and PA behaviors of SNAP-Ed eligible adults?
- 5) What is the relationship between exposure to a targeted social marketing campaign and SOC related to FV consumption and PA among SNAP-Ed eligible adults?
- 6) What are the most commonly reported barriers to FV consumption and PA among SNAP-Ed eligible adults?

Summary

Findings from this study indicate that the LWA branded social marketing campaign and its consumer tested billboard messages and images were successful in capturing the attention of the target audience, initiating considerations for behavior modifications, and prompting behavior change. Recalled exposure to billboard messages was more common than awareness of the LWA brand. In fact, a slight majority of the sample (50.5%) reported seeing at least one billboard during the 12-week outdoor advertising campaign, while 29.3% confirmed awareness of the brand. Although a convenience sample of BQ parents was used for this study, there was no evidence of a confounding relationship between BQ group (treatment or control) and either brand awareness or billboard exposure.

When compared to respondents who did not recall billboards, exposed respondents were more likely to report better health, engage in healthier behaviors, and identify with the higher end of the SOC continuum. Specifically, exposed respondents reported significantly higher fruit and water consumption levels, and were significantly more likely to be in action or maintenance stages for fruit consumption and physical activity than their unexposed counterparts.

Due to limitations in the nonexperimental study design, it cannot be determined whether respondents' behavior and SOC were affected by the social marketing campaign or if respondents had been practicing the campaign's target behaviors prior to exposure. However, a substantial number of respondents who had seen billboards and/or recognized the LWA brand self-reported changing their behavior after encountering the campaign messages. Eating more FV and drinking more water were the most commonly reported actions, each selected by more than one-third of respondents.

Among the most commonly reported barriers to the campaign's target behaviors of FV consumption and physical activity were being too busy, not liking or already eating enough FV, the expense of FV, and poor physical health. Despite these barriers, the majority of respondents were in the preparation stage or higher for changing FV consumption and physical activity behaviors, indicating a general awareness of a need for change and an openness to education and support. Considering the findings related to exposure and behavior and the additional affirmation of self-reported behavior change after seeing campaign messages, this evaluation of the LWA social marketing campaign yielded promising insights into the reach and potential effects among the target population and that warrants continued campaign implementation and evaluation.

Conclusions

Campaign Reach, Brand Awareness, and Exposure

The LWA campaign included 64 billboards in 44 counties that drew an estimated 41 million impressions during the 12-week run. In addition to billboards, multiple delivery channels were used to reach the target audience. These included a campaign website, social media, text messaging, branded recipe cards and other educational materials, and signage in SNAP-Ed's local partnering organizations such as parks, walking trails, grocery stores, farmers markets, and schools.

In this study, slightly less than one third of participants were aware of the brand LWA. When probed further to assess if they had seen any of the campaign's billboards, substantially more (50.5%) respondents recognized at least one of the campaign's three specific health promotion messages. Compared to other social marketing studies, this indicates an acceptable level of awareness and exposure for a campaign in its infancy. For example, a recent study in Oklahoma reported 23.8% awareness during the first two years of a Rethink Your Drink campaign (James et al., 2020). Brand awareness in the national Fruits & Veggies – More Matters campaign started at 11% in the year 2007 and increased to 26% by 2012 (Rekhy & McConchie, 2014). Similarly, the Go for 2&5 national campaign evaluation indicated increasing awareness over time, which study authors say emphasizes the importance of implementing a social marketing campaign over an extended period to build awareness and increase effects on behavior change (Pollard et al., 2008).

Although the campaign was targeted to a low-income audience, some significant differences in brand awareness were identified based on factors related to SES. Specifically, respondents who were healthier, more educated, food secure, and did not receive any

government assistance were more likely to report brand awareness than those who were less educated, food insecure, or participated in at least one assistance program. These differences, with the exception of health status, were not observed in exposure to the billboard messages, indicating a broader reach was achieved for messaging than branding. Brand awareness could be expected to increase over time, but lower brand awareness compared to message recall among the target audience could indicate a need to adjust some aspects of the brand for better resonance with its intended audience.

Convenience Sampling Considerations

Although using a convenience sample limited generalizability of the results, it did ensure that the specific intended target audience for the social marketing campaign was included in the sample. In previous SNAP-Ed program evaluations, the author of this study conducted telephone surveys using random-digit-dialing procedures and found this method vulnerable to error, resulting in a non-representative sample of primarily older adults with no children. The intended target audience of low-income, young adult parents were underrepresented. Social marketing literature has stressed the importance of initially selecting a narrow target audience for which exposure is achievable and then customizing campaign materials and messages to help ensure positive behavioral outcomes (Hornik & Kelly, 2007; Tobey et al., 2016).

It is possible that observed relationships resulted from a spurious correlation between campaign exposure and exposure to other obesity prevention activities. It is possible some survey respondents were exposed to obesity prevention efforts unmeasured in this study. This was partially addressed through analysis for a relationship between campaign exposure and group assignment in the SNAP-Ed school-based obesity prevention initiative, BQ. The fact that no

significant relationship was evident between participation in the BQ intervention and exposure to the marketing campaign further supports the sampling method used in this study.

Target Health Behaviors

The average numbers of cups of fruits and vegetables consumed daily by respondents in this study (1.49 and 1.64 respectively) were below the USDA recommendations of 2 cups of fruit and 2.5 cups of vegetables per day for adults (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2020). Campaign exposure was associated with increased fruit consumption, but not vegetable consumption. Although not fully the case in this study, consumption and readiness to change are generally higher for fruits than for vegetables. For this reason, Glasson, Chapman, and James (2011) recommended they be targeted separately in social marketing campaigns, with more emphasis placed on vegetables. Findings of this study could indicate a need for more focused messaging around vegetables rather than FV combined.

Most respondents reported drinking a sufficient amount of water daily, especially those who were exposed to the campaign. Consumption of SSB was also relatively high, with more than a quarter (28.4%) of participants drinking regular non-diet soda and almost one third (30.9%) drinking other SSB at least once a day. This is equal or higher to regular soda and other SSB consumption frequencies of Oklahomans surveyed at baseline in a social marketing study by White et al. (2018), which were 28.8% and 24.4% respectively. In this study, no significant differences were observed in SSB consumption based on exposure, which indicates a potential need for more specific messaging around SSB reduction.

Respondents in this study on average did not engage in recommended amounts of daily physical activity for adults. This campaign relied on tailored messaging around walking for physical activity, which was intended to support small, manageable increases in PA. However,

there were no associations between PA and exposure, and the most frequent response to the number of days engaging in PA was zero days per week. Days of exercise was slightly higher in the exposed group ($M = 3.14$) than in the not exposed group ($M = 2.87$), but the difference was not statistically significant.

Limited findings related to PA might indicate greater barriers to PA that require more intervention components to address. An intervention employing solely mass media to promote PA was successful in improving attitudes toward PA among a low-income Black/African-American audience, but did not achieve significant behavior change over five months (Beaudoin, Fernandez, Wall, & Farley, 2007). Conversely, the Positive Action for Today's Health (PATH) trial was successful in increasing walking among underserved Black/African-American communities by relying on a grassroots approach to develop materials and deliver them through interpersonal channels for social marketing messages. Promotional and educational items featuring campaign messages were delivered by community leaders to increase participation in a community walking club. Additionally, steps were taken to improve local walking trails and enhance safety and security during walks (D. K. Wilson et al., 2015). In this study, LWA intervention components to promote PA included mass media, social media, signage in partnering parks and trails, and educational reinforcement tools such as simple pedometers to encourage walking. It is likely that more intense intervention is needed to address barriers to PA at higher levels of the SEM.

Additional associations were observed between the campaign's target behaviors and certain demographic variables. Specifically, lower fruit consumption was reported by people of color and those who participated in government assistance programs. Additionally, greater water consumption was associated with higher education levels and food security, whereas SSB

consumption was more common among respondents who were food insecure, had lower education levels, or participated in assistance programs. However, as this study was cross-sectional in nature, it is not possible to conclude whether the differences resulted from a failure of the campaign to reach and resonate with its target audience, are a reflection of health disparities related to race and socioeconomic status, or a combination of causal factors was present. The significant differences in behavior observed among respondents of all demographics who were exposed to the campaign messages compared to those who were not exposed indicates the campaign was likely successful in reaching the intended audience despite these differences.

Barriers and Readiness to Change

The most commonly reported barriers to the campaign's target behaviors of FV consumption and physical activity were being too busy, not liking or already eating enough FV, the expense of FV, and poor physical health. These barriers have been documented consistently with similar target audiences (Dharod et al., 2011; Gray, Hardman, & Byrd, 2020; Hampson et al., 2009). Understanding barriers to behavior change is important in social marketing. For example, a campaign encouraging adults to eat healthfully may not be as effective if it ignores the target audience's limited access to grocery stores offering healthier fare (Evans, Wallace, et al., 2015).

Despite these barriers, the majority of respondents were in the preparation stage or higher for changing FV consumption and physical activity behaviors, indicating general awareness of a need for change and openness to education and support. People in preparation stage have been described as decidedly ready to modify their behavior in the near future. These individuals have begun making small behavioral adaptations or adjusting their environment to facilitate change (Tweneboah-Koduah & Owusu-Frimpong, 2013). For this group, social

marketing to support behavior change could potentially be more effective when intentionally coupled with PSE strategies to create environments more suitable to change. Messaging could be tailored for this segment to encourage more intentional thought about how external environments influence behavioral decisions and trigger action to change certain environmental factors.

Implications

French and Blair-Stevens (2006) argued that interventions should be theory-based, but not merely to inform design. They posit that theory should be used to guide consumer research and development of components of the marketing methods mix (4Ps). Noar et al. (2007) conducted a meta-analysis and found the TTM to be a promising theory for segmenting audiences and creating tailored health messages to individuals in unique stages because of the varying levels of knowledge, understanding, skills, and motivation individuals in different stages of change possess. A future implication for LWA is to use the TTM to inform audience segmentation. If the target audience were segmented into stages of readiness to change, specific messages and materials could be designed to impact individuals at different stages along the continuum.

Evaluation of social marketing is notoriously challenging as Andreasen acknowledged in his seminal work, “Marketing Social Marketing in the Social Change Marketplace.” The overlapping nature of marketing techniques, communication channels, and environmental changes inherent in comprehensive social marketing interventions make it difficult to pinpoint the specific contributions of separate elements of broad social marketing campaigns (Andreasen, 2002). Farrelly et al. (2005) pointed out that there are also ethical and budgetary reasons for providing a social marketing intervention to an entire population versus assigning groups to treatment and control. Nonetheless, a more rigorous evaluation model similar to that used by

Blitstein et al. (2016) could be used in the future to measure effects of the LWA campaign as an addition to a school-based intervention for parents. Behavioral change could be measured with a pre-test and post-test, and compared between a group exposed to social marketing and educational intervention, a second group with only educational intervention, and a comparison or control group with neither education nor social marketing exposure.

Additionally, attempts could be made to evaluate other components of the LWA campaign. The VERB campaign assessed promotional events through observation and intercept surveys to collect participant demographics and interaction patterns with campaign materials and activities (Grier & Bryant, 2005). Live Well Alabama could use this method to assess recipe demonstrations and brief educational encounters with SNAP-Education educators, or to measure the impact of trail marker signs on physical activity or point-of-purchase signage in retail settings on FV purchases. Such focus on individual delivery channels could be a component of process evaluation, which is recommended for understanding how campaigns were implemented and informing adaptations or corrections (Luecking et al., 2017).

Another potential evaluation route is to measure changes in the population of interest over time. National and local campaigns have employed this method in which different samples from within the target population respond to the same set of survey questions across years of campaign implementation (James et al., 2020; Pollard et al., 2008; Price et al., 2008). While differences between the sample cannot be treated as indicative of individual behavior change, results from this type of study can reveal trends in population readiness to change and adoption of healthy behaviors which has value in public health research. Pollard et al. (2008) argued in favor of implementing and evaluating social marketing campaigns over time to encourage and

assess incremental increases in knowledge, intention to change, and behavior within the target population.

Finally, Wymer (2011) suggested that the “greatest barrier to social marketing program effectiveness is the failure to remove environmental barriers and instead focus on individual barriers” (p. 26). The effectiveness of social marketing interventions could be improved by targeting upstream causes of the social problem. He argued social marketers should recognize the environmental and societal factors that negatively influence individual behavior and impede change and develop interventions targeted beyond the individual level of influence. As LWA brand recognition and trust increases among individuals, organizations, and institutions, efforts may be tailored to target upstream decision makers with making changes that affect entire communities or even the whole state.

Currently, efforts are underway to integrate the LWA campaign into SNAP-Ed interventions with independent grocers in Alabama to increase supply and demand for healthier options. Targeting these upstream individuals, the grocers, has potential to impact the environments in which individuals in the target audience shop, making it easier and more cost-effective for them to change personal shopping behaviors. Addressing upstream causes of obesity in the food system as a whole paves the way for downstream approaches, such as educating people about nutrition, to have a greater ultimate impact (Dorfman & Wallack, 2007).

The food retail environment is just one example of an upstream factor that contributes to obesity. In the future, this and many others may be addressed through multi-sector partnerships. Success is greater for social marketing campaigns with more collaboration between industry, retail, government, and foundations. “Collaboration helps in promoting a consistent message across all stakeholders and the community and assists in the creation of a larger pool of

funds available for promotional initiatives” (Rekhy & McConchie, 2014, p. 118). Once that begins to happen in Alabama, the messages promoted by LWA campaign may require a shift toward encouraging individuals to take more advanced courses of action to improve their health. In its earliest phase, LWA messages were crafted to respect the limited options and barriers many Alabamians reported in this study by encouraging simple, realistic behavior changes, such as eating one more fruit or vegetable each day, choosing water more often, and going for a walk.

Recommendations for Future Research

Numerous studies, including this one, have explored barriers and motivators for changing nutrition and PA behaviors among various populations with low SES. Many more use these insights as the basis for social marketing or other health promotion intervention development (Pivonka et al., 2011; Tobey et al., 2016). Still, further formative research is needed to understand the salient beliefs of the LWA target audience related to eating and PA behaviors. Rather than relying on appeals to change behavior simply because it is good for health, the campaign could evolve to include more specifically targeted messages for SSB reduction, for example, that are informed by the beliefs influencing the audience and aimed at changing or appealing to them (Hornik & Kelly, 2007). Beverage consumption in particular is an area for which more research is needed to understand Alabamians’ consumption habits, motivators, and barriers to change.

Better tailored messages and audience segmentation may also facilitate a stronger connection with a branded campaign among the target audience (Evans, Blitstein, et al., 2015). Recently, Englund et al. (2020) highlighted the need for more research on the strategies and outcomes of branded social marketing campaigns. In this study, brand awareness was good, but lower among participants of certain demographics and SES factors than others. Evans, Blitstein,

et al. (2015) recommended more branded campaigns utilize validated measures of branding to further explore the relationship between resonance with a brand and adoption of its promoted behaviors. Future research should explicitly measure consumer perceptions of branding common in traditional marketing, such as equity, loyalty, and personality, and results should be used to inform adaptations in campaign design and implementation.

Finally, future research should explore evaluation methods with reasonable returns on investment. It is challenging and expensive to evaluate a multi-level intervention that includes social marketing, education, and PSE change strategies within a social ecological approach to obesity prevention and health promotion. Many organizations implementing these programs, like SNAP-Ed, rely on grant funding, donations, or simply operate with limited budgets. Often, after implementation expenses are incurred, little is left for evaluation costs. In this study, formative research was conducted with behavioral targets already decided and mass media content already developed. Materials were then adapted based on focus group findings. Had time and money allowed for a baseline survey and earlier formative evaluation to guide development of all aspects of the campaign, outcomes may be more easily detectable. However, this is a common issue in community-based intervention planning. Grier and Bryant (2005) insist that parts of the process can be truncated to meet circumstantial demands, and that mining data from published literature, state program data sets, and prior experience with a target audience is appropriate and can provide valuable insights for program planning. Therefore, from a practical standpoint, it is important for future social marketing research to explore effective evaluation methods with practical applications in the field of community nutrition.

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Appendix A

IRB Approval Form for Primary Study for Data Collection

**AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS
REQUEST for MODIFICATION**

For help, contact: THE OFFICE OF RESEARCH COMPLIANCE (ORC), 115 Ramsay Hall, Auburn University
Phone: 334-844-5966 e-mail: IRBAdmin@auburn.edu Web Address: <http://www.auburn.edu/research/vpr/ohs>

Revised 2.1.2014 Submit completed form to IRBsubmit@auburn.edu or 115 Ramsay Hall, Auburn University 36849.

Form must be populated using Adobe Acrobat / Pro 9 or greater standalone program (do not fill out in browser). Hand written forms will not be accepted.

1. Protocol Number: 17-288 MR 1707
2. Current IRB Approval Dates: From: 7/19/18 To: 7/18/18
3. Project Title: Recipe Tester Club for Body Quest Parent

<u>Katie Funderburk</u>	<u>Ext Specialis</u>	<u>ACES</u>	<u>3347343149</u>	<u>kem0017@auburn.edu</u>
Principal Investigator	Title	Department	Phone	AU E-Mail (primary)
<i>Katie Funderburk</i>		<u>207 Duncan Hall</u>		
PI Signature		Mailing Address		Alternate E-Mail

<u>Barb Struempler</u>	<u>FA Signature</u>	<u>Department</u>	<u>Phone</u>	<u>AU E-Mail</u>
Name of Current Department Head:				<u>struebj@auburn.edu</u>

5. Current External Funding Agency and Grant number: AL DHR-FY18; FOP 376387 403501 3000
6. a. List any contractors, sub-contractors, other entities associated with this project:
Altarum, Market Decisions Research
- b. List any other IRBs associated with this project: _____
7. Nature of change in protocol: (Mark all that apply)

- Change in Key Personnel ([attach](#) CITI forms for new personnel)
- Change in Sites ([attach](#) permission forms for new sites)
- Change in methods for data storage/protection or location of data/consent documents
- Change in project purpose or questions
- Change in population or recruitment ([attach](#) new or revised recruitment materials as needed)
- Change in consent procedures ([attach](#) new or revised consent documents as needed)
- Change in data collection methods or procedures ([attach](#) new data collection forms as needed)
- Other (explain): Addition of a phone survey to evaluate reach and effectiveness of billboards placed near Body Quest schools. Phone survey to be conducted and analyzed by a non-profit consulting organization.

FOR ORC OFFICE USE ONLY			
DATE RECEIVED IN ORC:	_____ by _____	MODIFICATION #	_____
DATE OF IRB REVIEW:	_____ by _____	PROTOCOL APPROVAL CATEGORY:	_____
DATE OF IRB APPROVAL:	_____ by _____	MODIFICATION APPROVAL CATEGORY:	_____
COMMENTS:	INTERVAL FOR CONTINUING REVIEW: _____		

Appendix B

IRB Approval Form for Secondary Dissertation Study

Auburn University Human Research Protection Program

EXEMPTION REVIEW APPLICATION

For information or help completing this form, contact: THE OFFICE OF RESEARCH COMPLIANCE, Location: 115 Ramsay Hall Phone: 334-844-5966 Email: IRBAdmin@auburn.edu

Submit completed application and supporting material as one attachment to IRBsubmit@auburn.edu.

1. PROJECT IDENTIFICATION Today's Date 9/9/20

a. Project Title Evaluation of a Targeted Social Marketing Campaign Promoting Nutrition and Physical Activity to SNAP-Ed Eligible Adults in Alabama

b. Principal Investigator Katie Funderburk Degree(s) EdS, MS Rank/Title Extension Specialist / Doctoral Candidate Department/School Alabama Extension / Adult Education Phone Number (334) 734-3149 AU Email kem0017@auburn.edu

Faculty Principal Investigator (required if PI is a student) James Witte Title Chair, Professor Department/School Aviation Department Phone Number (334) 844-3054 AU Email witteje@auburn.edu

Dept Head Department/School Phone Number AU Email

c. Project Personnel (other PI) - Identify all individuals who will be involved with the conduct of the research and include their role on the project. Role may include design, recruitment, consent process, data collection, data analysis, and reporting. Attach a table if needed for additional personnel.

Personnel Name Degree (s) Rank/Title Department/School Role AU affiliated? YES NO If no, name of home institution Plan for IRB approval for non-AU affiliated personnel?

Personnel Name Degree (s) Rank/Title Department/School Role AU affiliated? YES NO If no, name of home institution Plan for IRB approval for non-AU affiliated personnel?

Personnel Name Degree (s) Rank/Title Department/School Role AU affiliated? YES NO If no, name of home institution Plan for IRB approval for non-AU affiliated personnel?

d. Training - Have all Key Personnel completed CITI human subjects training (including elective modules related to this research) within the last 3 years? YES [checked] NO

The Auburn University Institutional Review Board has approved this Document for use from 09/22/2020 to Protocol # 20-452 EX 2009

Appendix C

Billboard Designs

Have you had a fruit or vegetable today?

LIVE WELL ALABAMA #EatBetter

Follow Us: [Facebook] [Twitter] [Pinterest]

extension ALABAMA PUBLIC HEALTH ALABAMA A&M & AUBURN UNIVERSITIES

This material was funded by USDA's Supplemental Nutrition Assistance Program (SNAP) to be used as a marketing promotion and materials. www.extensions.edu. The Alabama Cooperative Extension System (ACES) is an equal opportunity provider and employer. www.extensions.edu. The Alabama Cooperative Extension System (ACES) is an equal opportunity provider and employer. www.extensions.edu.

Have you walked today?

LIVE WELL ALABAMA #MoveMore

Follow Us: [Facebook] [Twitter] [Pinterest]

extension ALABAMA PUBLIC HEALTH ALABAMA A&M & AUBURN UNIVERSITIES

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Make water your go-to drink.

LIVE WELL ALABAMA #MakeAChange

Follow Us: [Facebook] [Twitter] [Pinterest]

extension ALABAMA PUBLIC HEALTH ALABAMA A&M & AUBURN UNIVERSITIES

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Appendix D

Survey Instrument

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

INT Hello, may I speak with _____? My name is _____ and I'm calling on behalf of the Auburn University. We're conducting a brief survey – we are not selling anything – and we would like to ask you a few questions. All of your responses are confidential. The survey takes about 10 minutes to complete and the results will be used to improve the health of families in Alabama. You may end the interview at any time or refuse a question if you want.

[IF ASKED, INTERVIEWER SHOULD SAY THE SURVEY IS ABOUT 30 QUESTIONS LONG.]

First, are you at least 18 years old?

1	Yes	Eligible respondent; Continue
2	Call back	Setup an appointment
3	No	Thank and terminate
8	Language barrier	Thank and terminate
99	Refusal	Thank and terminate

Before we begin I want to assure you that all of your answers are strictly confidential. They will be combined with answers from other people from across the state. This call may be monitored for quality assurance.

Social Marketing Campaign Exposure:

Q1. Have you heard of Live Well Alabama?
If yes: Where do you hear about Live Well Alabama?

Read responses: (select all mentioned)

- 1 Billboards, banners, signs
- 2 Social media (Facebook, Pinterest, Twitter)
- 3 Website
- 4 Text Messages
- 5 Recipe card received at educational event
- 6 Handout received at educational event
- 7 School or summer program for children
- 8 Community center
- 9 My faith community
- 10 Park, trail
- 11 Grocery store, corner store
- 12 Farmers market
- 13 Community or school garden
- 14 Emergency food assistance site (food pantry, soup kitchen, backpack program)

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

Q2. Have you seen any billboards promoting the importance of eating more fruits and vegetables with the message, *"Have you had a fruit or vegetable today?"*

If yes: About how many times do you see this message on billboards in the past few months?

00	No	Did not see billboard
01-20	Yes	1-20 times
88	Yes	Do not recall how many times
99		Don't know / unsure

Q3. Have you seen any billboards promoting the importance of getting more physical activity or exercise with the message, *"Have you walked today?"*

If yes: About how many times do you see this message on billboards in the past few months?

00	No	Did not see billboard
01-20	Yes	1-20 times
88	Yes	Do not recall how many times
99		Don't know / unsure

Q4. Have you seen any billboards promoting the importance of drinking more water with the message, *"Make water your go-to drink."*

If yes: About how many times do you see this message on billboards in the past few months?

00	No	Did not see billboard
01-20	Yes	1-20 times
88	Yes	Do not recall how many times
99		Don't know / unsure

[IF RESPONDENT ANSWERS YES TO Q1, Q2, Q3 OR Q4]

Q5. Did seeing any of these healthy eating messages on billboards lead you to try something new or do something different for you or your family?

Read responses: (select all mentioned)

- 1 Thought about making healthier food choices
- 2 Ate more fruits and vegetables
- 3 Tried a new fruit or vegetable
- 4 Bought more fruits and vegetables at the store or farmers market
- 5 Planned healthy meals for me or my family
- 6 Exercised more

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

- 7 Tried a new exercise or physical activity
- 8 Drank more water
- 9 Drank less sugar-sweetened beverages (such as sweet tea, soda, Kool-Aid)
- 10 Searched for more information about SNAP-Ed or Alabama Extension
- 11 Searched for Live Well Alabama online
- 12 Signed up for or took a nutrition class
- No, did not try or do something different after seeing the messages
- 88 Other [specify]
- 99 Don't know / unsure

Health and Nutrition:

Q6. Would you say in general that your health is...

Read responses:

- 1 Excellent
- 2 Very good
- 3 Good
- 4 Fair
- 5 Poor
- 99 Don't know / Unsure

Q7. About how often do you drink regular soda or soft drinks that contain sugar? Do not include diet soda or diet soft drinks.

Read responses:

(Select only one)

- 1 Never or less than one time per week
- 2 1 time per week
- 3 2-3 times per week
- 4 4-6 times per week
- 5 1 time per day
- 6 2 times per day
- 7 3 or more times per day
- 99 Don't know / unsure

Q8. About how often do you drink sweetened drinks, such as sweet tea, Kool-Aid, cranberry drink, and lemonade? Include fruit drinks you made at home and add sugar to but do not include 100% fruit juice.

Read responses:

(Select only one)

- 1 Never or less than one time per week

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

- 2 1 time per week
- 3 2-3 times per week
- 4 4-6 times per week
- 5 1 time per day
- 6 2 times per day
- 7 3 or more times per day
- 99 Don't know / unsure

Q9. How often do you drink a glass or bottle of water? Include tap, bottled and sparkling water.

Read responses: (Select only one)

- 1 Never or less than one time per week
- 2 1 time per week
- 3 2-3 times per week
- 4 4-6 times per week
- 5 1 time per day
- 6 2 times per day
- 7 3 or more times per day
- 99 Don't know / unsure

Q10. How many cups of vegetables do you eat each day? This can include fresh, frozen, canned or dried vegetables. For example, a cup might be one large tomato, 12 baby carrots or 2 cups of lettuce.

Read responses: (Select only one)

- 1 None
- 2 ½ cup
- 3 1 cup
- 4 1½ cups
- 5 2 cups
- 6 2½ cups
- 7 3 cups or more
- 99 Don't know / unsure

Q11. What are the main reasons why you do not eat more vegetables?

Do not read responses: (Select all mentioned)

- 1 Too busy
- 2 Too expensive
- 3 Not available at stores near where I live
- 4 Do not like vegetables

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

- 5 Already eat enough vegetables
- 6 Do not know how to cook or prepare vegetables
- 7 Vegetables spoil too quickly
- 8 Transportation (cannot get to a store to buy vegetables)
- 9 Prefer unhealthy foods
- 10 Health reasons
- 77 No barriers
- 88 Other [specify]
- 99 Don't know / unsure

Q12. Which of the following statements do you agree with most?

Read responses: (Select only one)

- 1 I am not thinking about eating more vegetables.
- 2 I am thinking about eating more vegetables and planning to start within 6 months.
- 3 I am definitely planning to eat more vegetables in the next month.
- 4 I am trying to eat more vegetables now.
- 5 I am already eating 3 or more servings of vegetables per day.

Q13. How many cups of fruits do you eat each day? This can include fresh, frozen, canned or dried fruits. For example, a cup might be one large orange, one large banana or 32 grapes.

Read responses: (Select only one)

- 1 None
- 2 ½ cup
- 3 1 cup
- 4 1½ cups
- 5 2 cups
- 6 2½ cups
- 7 3 cups or more
- 99 Don't know / unsure

Q14. What are the main reasons why you do not eat more fruits?

Do not read responses: (Select all mentioned)

- 1 Too busy
- 2 Too expensive
- 3 Not available at stores near where I live
- 4 Do not like fruits
- 5 Already eat enough fruits
- 6 Do not know how to cook or prepare fruits

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

- 7 Fruits spoil too quickly
- 8 Transportation (cannot get to a store to buy fruits)
- 9 Prefer unhealthy foods
- 10 Health reasons
- 77 No barriers
- 88 Other [specify]
- 99 Don't know / unsure

Q15. Which of the following statements do you agree with most?

Read responses: (Select only one)

- 1 I am not thinking about eating more fruit.
- 2 I am thinking about eating more fruit and planning to start within 6 months.
- 3 I am definitely planning to eat more fruit in the next month.
- 4 I am trying to eat more fruit now.
- 5 I am already eating 3 or more servings of fruit per day.

Physical Activity:

Q16. During the past week, how many days did you exercise when you breathed harder than normal for at least 30 minutes?

- 0-7 Number of days
- 99 Don't know / unsure

Q17. About how long have you been participating in this type of physical activity or exercise?

Read responses: (Select only one)

- 1 Less than 1 month
- 2 1-2 months
- 3 3-6 months
- 4 Over 6 months
- 99 Don't know / unsure

Q18. Are you interested in engaging in more regular physical activity or exercise over the next 6 months?

- 1 Yes
- 2 No
- 99 Don't know / unsure

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

Q19. Are you interested in engaging in more regular physical activity or exercise over the next 30 days?

- 1 Yes
- 2 No
- 99 Don't know / unsure

Q20. What are the main reasons why you do not engage in more physical activity or exercise currently?

Do not read: (select all mentioned)

- 1 Too busy (not enough time)
- 2 Too expensive (cost of gym membership or equipment)
- 3 No park, recreation facilities or gym where I live
- 4 Unsafe neighborhood
- 5 Poor physical health
- 6 Not motivated / not interested / do not like to exercise
- 7 Weather / season
- 8 Do not need exercise
- 9 Already exercise enough
- 10 Childcare
- 11 Transportation
- 12 Uncomfortable exercising in public
- 13 My job is my activity
- 88 Other [specify]
- 99 Don't know / unsure

Food Security:

Please indicate whether the next three statements are often true, sometimes true, or never true for you or your household over the last 12 months.

Q21. "The food that we bought just didn't last and we didn't have money to get more."

- 1 Often true
- 2 Sometimes true
- 3 Never true
- 99 Don't know / unsure

Q22. "We couldn't afford to eat balanced meals."

- 1 Often true
- 2 Sometimes true
- 3 Never true
- 99 Don't know / unsure

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

Q23. "I worried whether my food would run out before I got money to buy more."

- | | |
|----|---------------------|
| 1 | Often true |
| 2 | Sometimes true |
| 3 | Never true |
| 99 | Don't know / unsure |

Demographics:

D1. Which of the following best describes your age?

Read responses:

- | | |
|----|-------------------------------|
| 01 | 18 to 24 |
| 02 | 25 to 34 |
| 03 | 35 to 44 |
| 04 | 45 to 54 |
| 05 | 55 to 64 |
| 06 | 65 to 74 |
| 07 | 75 or older |
| 99 | Don't know / unsure / refused |

D2. What is the highest grade or year in school you completed?

Do not read:

- | | |
|----|--|
| 1 | Less than high school |
| 2 | Graduated high school |
| 3 | Some college or vocational training |
| 4 | Graduated vocational/technical college (2-year Associate Degree) |
| 5 | Graduated college (4-year Bachelor Degree) |
| 6 | Attended Graduate or Professional school (Master Degree, PhD, MPA, Lawyer) |
| 99 | Don't know / unsure / refused |

D3. Are you Hispanic or Latino?

- | | |
|----|-------------------------------|
| 1 | Yes |
| 2 | No |
| 99 | Don't know / unsure / refused |

D4. Describe your race.

Read responses:

(select all mentioned)

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

- 1 White/Caucasian
- 2 Black/African American
- 3 American Indian or Alaska Native
- 4 Native Hawaiian or Other Pacific Islander
- 5 Asian
- 6 Other/ please specify: _____
- 99 Don't know / unsure / refused

D5. What is your employment status?

Read responses:

- 1 Employed Full Time
- 2 Employed Part Time
- 3 Unemployed or temporarily laid off
- 4 Retired
- 5 Homemaker
- 6 Student
- 7 Other/something else (specify) _____
- 99 Don't know / unsure / refused

D6. Are you?

Read responses:

- 1 Married
- 2 Single
- 3 Widow / Widower
- 99 Don't know / unsure / refused

D7. Did you or other members of your household participate in any of the following programs in the past year?

Read responses:

(select all mentioned)

- 1 SNAP / EBT (food stamps)
- 2 WIC
- 3 Free or reduced-price school lunch or breakfast
- 4 Free summer meals
- 5 Head Start
- 6 Food Pantry
- 7 TANF (public assistance)
- 8 Medicaid
- 9 Did not participate in any of these programs

**Altarum Institute:
Alabama SNAP-Ed Social Marketing Evaluation Survey**

99 Don't know / unsure / refused

D8. Including yourself, how many adults age 18 or older currently live in your home?

01-5 Number of adults

99 Don't know / unsure / refused

D9. How many children age 17 or younger currently live in your household, if any?

00 None

01-08 Children in household

99 Don't know / unsure / refused

CONC Thank you very much for your time. Your comments are greatly appreciated.

GR INTERVIEWER: ENTER GENDER OF RESPONDENT

1 Male

2 Female

99 Don't know / unsure