Social Marketing Campaigns to Promote Healthy Eating in Low-Income Louisiana Environments: A Mixed Methods Formative Assessment

Linda Fergus
Louisiana State University and Agricultural and Mechanical College

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SOCIAL MARKETING CAMPAIGNS TO PROMOTE HEALTHY EATING IN LOW-INCOME LOUISIANA ENVIRONMENTS: A MIXED METHODS FORMATIVE ASSESSMENT

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The School of Nutrition and Food Sciences

by

Linda Fergus
B.S., Louisiana State University, 1989
M.S., Texas Woman’s University, 1990
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<td>CVD</td>
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<td>DGA</td>
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<td>EDNP</td>
<td>Energy dense nutrient poor</td>
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<td>EFNEP</td>
<td>Expanded Food and Nutrition Education Program</td>
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<td>FGD</td>
<td>Focus group discussion</td>
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<td>FM</td>
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<td>FNS</td>
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<td>Healthy Eating Index</td>
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<td>LA</td>
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<td>PA</td>
<td>Physical activity</td>
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<td>PATH</td>
<td>Positive Action for Today’s Health social marketing campaign</td>
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<td>PBC</td>
<td>Perceived behavioral control</td>
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<td>PCC</td>
<td>Population, Concept, Context</td>
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<td>PIUKP</td>
<td>Plate It Up Kentucky Proud social marketing campaign</td>
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<td>PRISMA-ScR</td>
<td>Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews</td>
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<td>RUCC</td>
<td>Rural-Urban Continuum Codes</td>
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<td>SN</td>
<td>Social norm</td>
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<td>SNAP-Ed</td>
<td>Supplemental Nutrition Assistance Program – Education</td>
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<td>TANF</td>
<td>Temporary Aid for Needy Families</td>
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<tr>
<td>TPB</td>
<td>Theory of Planned Behavior</td>
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<td>US</td>
<td>United States</td>
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<td>USDA</td>
<td>US Department of Agriculture</td>
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<td>WIC</td>
<td>Special Supplemental Program for Women, Infants, and Children</td>
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TERMS

Behavioral Economics – a theory or framework concerning the psychological, cognitive, and social processes that govern human decision-making and choice.

Commitment – a pact to engage in a planned behavior.

Conjoint Analysis – a marketing analysis technique which uses a survey to obtain preference ratings for product features and is analyzed using regression.

Dietary Guidelines for Americans – guidelines to promote health, reduce nutrition-related chronic diseases, and offer guidance to obtain adequate nutrients provided every 5 years by the USDA and Department of Health and Human Services.

Exchange Theory – a theory used in social marketing campaigns which postulates that the benefits of changing behavior should be promoted to offset the price of engagement in new behaviors.

Grounded Theory – an inductive approach used in qualitative analysis to develop a concept or theory that is “grounded” in the participants’ experiences.

Healthy Eating Index – a measure of diet quality used to determine the alignment of dietary intake with the Dietary Guidelines of Americans.

Marketing Mix – a framework that consists of the 4 P’s of marketing (product, price, place, and promotion) and is used in planning social marketing campaigns.

MINDSPACE framework – a mnemonic describing the nine most influential Behavioral Economics interventions (messenger, incentive, norms, defaults, salience, priming, affect, commitment, and ego).

Quasi-experimental research – experiments that contain groups that have not been randomized or lack a control group.

Rural – defined by the Economic Research Service of the USDA as counties designated as nonmetropolitan classifications four through nine of the Rural-Urban Continuum Codes.

Scoping literature review – a literature review based on a systematic search procedure which determines the span of publications on a particular subject, shows the amount of literature available, and provides a summary of the literature.

Social Marketing Campaign – a program based on commercial marketing techniques to promote behavior change of individuals for the common good of a community or society.

Social Norms – expectations of human behavior designed to influence others through modeling.
Theory of Planned Behavior - suggests that human behavior is steered by (1) behavioral beliefs leading to attitudes about the behavior, (2) normative beliefs leading to subjective norms, and (3) control beliefs leading to perceived behavioral control to perform the behavior. These factors coalesce to form an individual’s intention to engage in the behavior, which leads to the performance of the behavior if enough actual behavioral control exists.

Urban - defined by the Economic Research Service of the USDA as counties that are designated as metropolitan classifications one, two, and three of the Rural-Urban Continuum Codes.
ABSTRACT

A healthy diet consistent with the Dietary Guidelines for Americans (DGA) is associated with reduced risk of obesity and chronic disease. Many people do not consume a healthy diet, especially those with limited resources. The purpose of this research was to study social marketing campaigns and message design factors that promote healthy eating and improved physical activity (PA) behaviors to low-income populations in Louisiana (LA) and to describe the attitudes, beliefs, and barriers of the rural, low-income LA population regarding healthy eating.

In a scoping literature review, an evidence map of publications regarding social marketing campaigns that aim to promote healthy eating and improved PA to low-income populations was produced. Formative and qualitative research about healthy eating predominated. This research identified preferences of the LA low-income population for Behavioral Economics (BE) interventions including messengers, social norms, and commitments in social marketing campaigns aiming to improve vegetable intake. There was significant variation in the main effects of the messenger variable \( F(4, 200) = 2.90, P = .0229 \) and the message variable \( F(4, 199) = 3.57, P = .0078 \). Pairwise comparisons showed lower preference ratings for the friend when compared to other messengers, i.e., mother (\( P = .0343 \)) and normal weight doctor (\( P = .0440 \)). Also, pairwise comparisons showed lower preference ratings for a descriptive norm when compared to other messages, i.e., grocery list pre-commitment (\( P = .0484 \)) and injunctive norm (\( P = .0351 \)). There was significant variation in the message variable and frequency of vegetable intake interaction \( F(8, 239) = 2.57, P = .0104 \).

Rural low-income LA residents noted the high cost and low palatability of healthy foods in formative research. Professionals for nutrition education were limited resulting in reliance on
the internet (when available), family, and friends. The low cost, wide availability, and high palatability of energy dense nutrient poor (EDNP) foods were barriers to healthy food consumption. More social support for planning meals and grocery shopping may improve healthy eating intentions. This research may be useful to organizations such as Supplemental Nutrition Assistance Program-Education (SNAP-Ed) that develop social marketing campaigns to promote healthy eating and improved PA to low-resource populations.
CHAPTER 1. INTRODUCTION

1.1 Introduction and background

The Supplemental Nutrition Assistance Program – Education (SNAP-Ed) provides nutrition education about healthy eating and promotes physical activity (PA) to help SNAP recipients follow the Dietary Guidelines for Americans (DGA). Diets which are consistent with the DGA are associated with reduced rates of obesity and chronic disease, but many U.S. residents do not regularly eat a healthy diet, including people in Louisiana (LA) where one-fourth of the population reports little or no vegetable consumption. One method that SNAP-Ed uses to promote behavior change is developing and disseminating social marketing campaigns which encourage healthy lifestyles. In this research, the results from a scoping literature review, focus group discussions (FGD), and a conjoint analysis (CA) survey will inform the development of social marketing messages for the improvement of eating and PA behaviors in low-income adults residing in LA.

In 2014, nutrition educators at the LSU AgCenter developed the first social marketing campaign for SNAP-Ed based the Food and Nutrition Service’s (FNS) core messages and implemented it in SNAP-Ed parishes of the state. Messages within the campaign promoted the consumption of fruit and vegetables, family mealtime, and PA. Subsequent evaluation revealed that the 2015 campaign reached one-half of the targeted SNAP-Ed population in LA. In 2016, researchers completed eight FGD to evaluate five proposed social marketing campaign messages resulting in message refinement and implementation in late 2017. Upon evaluation in 2018, researchers found that television promotions were reaching a large proportion of older audience members but not the younger target audience; thus, a recommendation was made to develop an online presence geared toward the younger demographic. Other recommendations were to
include more diversity in the individuals depicted in promotional advertisements and print materials, to increase the availability of culturally relevant recipes, to provide print materials in more languages, to vary the format of print materials, and to divert resources from radio advertising which was only reaching 19% of the SNAP-Ed population.9

To address the 2018 recommendations and LA residents’ needs, two new social marketing campaigns were proposed for low-income adults to improve healthy eating and PA behaviors. Since formative research was indicated for campaign development, the researcher conducted a scoping literature review about social marketing campaigns in the U.S. that aim to promote healthy eating and improved PA in the low-income population. Also, the researcher employed CA, a marketing analysis technique, to obtain message design preferences from low-income residents in LA for social marketing message development. Information about effective social marketing campaigns for rural, low-income people in the southeastern U.S. is limited. Since SNAP-Ed at LSU AgCenter primarily serves residents of rural parishes which are at greater risk of obesity and chronic disease than residents of urban areas,10-12 this research included a FGD with the rural low-income LA population. Tailoring social marketing campaigns regionally may address cultural differences and potentially increase the effectiveness of the campaign through improved resonance with the target audience.13

Historically, behavioral change theories have focused on knowledge-based interventions and persuasion to improve understanding, attitudes, and beliefs of others, thus, influencing their behavior. Developed by Ajzen, the Theory of Planned Behavior (TPB) postulates that human behavior is governed by three types of beliefs: 1) behavioral beliefs leading to attitudes about the behavior, 2) normative beliefs leading to subjective norms (SN) or the perceived influence of friends and family, and 3) control beliefs or perceived behavioral control (PBC) to engage in the
behavior. These factors unite to form an intention which may result in performing the behavior if circumstances permit and actual behavioral control exists. Social marketers apply the TPB to evaluate individual factors that affect behavior and to develop approaches to influence beliefs which may improve engagement in the behavior. Focus group discussion questions developed using the TPB will provide new information related to the influence of the attitudes, SN, PBC, and intentions on eating and PA behavior for the rural, low-income population. Despite a medium to large association between intention and a healthy eating pattern, i.e. lower fat foods or fewer calories, an opportunity exists to identify other important variables such as the context or situation in which the dietary and PA behavior choices occur.

Behavioral Economics (BE) theory proposes that when people make decisions, they are more influenced by context, such as the way the choices are presented, than by the mindful consideration posited by the behavior change theories. Thaler and Sunstein’s Nudge Theory emphasizes the construction of an environment to reduce the automatic choice, which is instinctive and potentially detrimental when made repeatedly, and to promote a healthy choice by making subtle alterations or nudges to the way the options are presented. Impacting the automatic system, nudges change the choice environment, and by making the best choice more evident, nudges may alter an individual’s decision and foster behavior change. This change may be appealing to the public as it occurs without a reduction in the number or type of food and beverage options and without monetary penalties, such as taxes on unhealthy foods or beverages. Healthy eating nudges best predict desired behavior when the nudge intervention shifts from a cognitive to affective and lastly to a behavioral approach, and may result in a 15.3% increase in healthy intake behaviors. In 2010, Dolan and colleagues developed the MINDSPACE framework, a mnemonic describing nine of the most influential effects on behavior - messenger,
Conjoint Analysis is a commercial marketing technique which utilizes a survey to collect data to quantify how individuals value different characteristics of a product (e.g., price, color, capacity, and optional features) and their willingness to tradeoff less desirable product features to acquire the product. This information is used to estimate the value of the characteristics in order to create a product with maximum appeal to the potential customers. Conjoint analysis measures the joint effect of multiple characteristics at once; then, one can segment the sample population by demographics and estimate the preferences of the population through market simulation techniques. Recently, CA has been used to study treatments in healthcare, health consciousness in food selection, and in social marketing campaigns. By assessing the elements of the MINDSPACE framework in the low-income population, CA may provide contextual insights that will augment social marketing message design features.

1.2 Review of literature

1.2.1 Nutrition, chronic disease, and dietary intake patterns

The Healthy Eating Index-2015 (HEI-2015) measures diet quality in U.S. participants aged two years and older by comparing actual food and beverage intake to the corresponding recommendations of the DGA. Higher diet quality scores on the HEI are inversely associated with mortality from cancer and cardiovascular disease (CVD) in normal-weight individuals with metabolic markers of obesity, and a higher HEI is inversely related to the risk of mortality from chronic diseases in adults. Consistent with national data, eleven percent of LA residents consumed the recommended daily amount of fruit, while eight percent consumed the

incentives, norms, defaults, salience, priming, affect, commitment, and ego. Using CA to study BE interventions may provide new information about preferred MINDSPACE effects in social marketing messages designed for the low-income population.
recommended amount of vegetables in 2015.\textsuperscript{30} Also, the residents with the highest poverty level consumed the least amount of vegetables. Nationally, the total average intake of grain foods has decreased significantly by 0.5-ounce equivalents (oz. eq.) from 2003-2004 to 2015-2016, and recent whole grain intakes have increased by 0.3 ounce equivalents to 0.9 ounce equivalents.\textsuperscript{31} Sodium intake is approximately 3500 mg/day in the adult population or 150 \% of the recommended amount, irrespective of income status.\textsuperscript{32} The total consumption of saturated fat also exceeds the DGA.\textsuperscript{31}

1.2.2 Physical activity and chronic disease

Small increases in PA from sedentary levels, i.e. utilizing one thousand calories per week, prevent chronic disease and reduce premature death.\textsuperscript{33} Physical activity is beneficial for reducing chronic disease, especially lowering the risk cancer (colon and breast) and CVD.\textsuperscript{34} The benefits of PA include decreasing depression, increasing brain health, improving weight status, and reducing fall-related injuries are discussed in the existing literature.\textsuperscript{35} In 2017, 23.6\% of U.S. adults met both the aerobic and muscle PA recommendations which is a slight increase from 2016.\textsuperscript{36} During 2019, LA residents reported engaging in aerobic activity (45\%) and strengthening exercises (34\%).\textsuperscript{6}

1.2.3 Chronic disease and obesity prevalence among the LA population

Residents in the southeastern U.S. have a higher prevalence of chronic diseases and more obesity with inadequate PA levels,\textsuperscript{37} and the state of LA ranked 46\textsuperscript{th}, 47\textsuperscript{th}, and 47\textsuperscript{th} in the U.S., respectively for heart disease and stroke, obese adults, and adults with diabetes in 2018.\textsuperscript{38} According to the 2013 Rural-Urban Continuum Codes (RUCC) by the United States Department of Agriculture (USDA), twenty-nine of sixty-four parishes (45\%) in LA are classified as nonmetropolitan. These range from the least rural areas to the most rural areas and encompass
levels four to nine of the RUCC codes. Thirty-five percent of U.S. adults living in the most rural areas reported having two or more chronic health conditions in 2013. The prevalence of diabetes and coronary artery disease is greater in residents of rural geographies, and the obesity rate is greater in U.S. nonmetropolitan areas with rates of 34% (nonmetropolitan) and 28% (metropolitan) reported. More unhealthy behaviors, including excess body weight and a lack of PA, are reported in rural versus urban U.S. counties.

1.2.4 Social marketing

According to Andreasen, “Social marketing is the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of the society of which they are a part.” While social marketing is differentiated from commercial marketing by its focus on individual or community behavior change for the benefit of society, both employ similar principles of campaign development and implementation including formative research, audience segmentation, the marketing mix, and analysis of the competition.

Formative research, a process which may ultimately conserve financial resources through avoiding strategic errors, ensures that the campaign is persuasive to the target audience by identifying unique attitudes and beliefs about the proposed behavior change. Social marketers segment the target population based on its culture, demographics, existing behaviors, or other factors, and they use segmentation analysis to identify the target groups for the tailoring of the campaign’s interventions. In 1960, McCarthy proposed a framework known as the “marketing mix of the four Ps – product, price, place, and promotion” - and it is often used to define how the campaign will be implemented. For example, the “product” represents the behavior change that is promoted in the social marketing campaign. The “price” is the personal
or material cost to the participant to change the behavior, e.g., spending time shopping for food or exercising. The social marketing campaign is promoted and distributed to the target audience in a physical or online location or “place” where the behavior change is supported, such as a mobile health unit in an area with low public transportation. Finally, the social marketing campaign is communicated to the target audience by a “promotion”, e.g., through advertising in the media or in person communications. Social marketers engage in ongoing evaluation of the campaign’s effectiveness and its sources of competition, and they make continual efforts to minimize the influence of the competition to the desired behavior in the target population.

1.2.5 Conjoint Analysis and the low-income population

In 2016, Della combined formative studies and a CA survey to design health promotion messages to increase the consumption of fruits and vegetables among African American adults. In Della’s study, the messenger was the most important message attribute when compared to the situation illustrated in the message, the behavior, the benefit of eating fruits and vegetables, and the actions illustrating how to eat more fruits and vegetables. While CA is an emerging method in health and social marketing, it has been successfully implemented in low- and middle-income populations with a range of educational attainment. For instance, Jeffrey used CA to model preferences of customers for healthy combination meals at restaurants in low-income communities. Conjoint Analysis represents an inexpensive and expeditious method to identify the preferred BE interventions for the low-income population in LA.

1.2.6 Behavioral Economics (BE) and the MINDSPACE Framework in low-income environments

The purpose of BE is to change the “choice architecture” to improve the likelihood of healthier choices, and it has been studied in healthy retail promotions located in low-income environments. Although research is limited in this area, Jilcott Pitts (2016) surveyed retail
customers in low-income counties regarding preferred BE strategies and found incentives (i.e., rewards for healthy purchases and discounts), social norms, and salience (i.e., healthy items at eye level) were the most preferred BE interventions.

However, research about the use of BE interventions in social marketing messages is emerging. Social marketing campaign messages which include social norms, messengers, and commitments demonstrate increased participation in health screenings for cancer and diabetes eye health,\textsuperscript{51-53} reduced calorie intake,\textsuperscript{54} and increased purchases of fresh produce in an urban low-income population.\textsuperscript{55} Behavioral economics and social marketing differ in approach, but they may be complementary.\textsuperscript{56} While social marketing aims to persuade people to engage in better behaviors for themselves and the good of society, BE strategies seek to promote behavior change instead of changing attitudes and beliefs. Another difference is social marketing emerged from commercial marketing techniques, and BE is rooted in economics theory. More studies about combining social marketing messages with BE interventions are needed to establish efficacy of this new approach to improve health in the low-income population.

1.2.7 Social marketing and the rural population

One concern about developing social marketing campaigns in LA is the lack of information regarding effective social marketing campaigns to promote nutrition and PA in rural areas of the U.S.\textsuperscript{57} However, in 2014 a successful campaign targeted rural Kentucky smokers and showed that culturally specific materials based on narratives from people in the community resulted in increased discussions with health providers about smoking cessation.\textsuperscript{58} A formative evaluation for a social marketing campaign targeting low-income, rural residents of Maine resulted in the development of supportive groups such as a buddy program for PA, a cooking club, and a fruit and vegetable discount buying club.\textsuperscript{59} Social marketing campaigns are
successful in persuading individuals to change their dietary and PA behaviors while employing efficiency in reaching large numbers of people.\textsuperscript{60-62} However, more evidence is needed regarding the most effective social marketing campaigns for the low-income, rural population in LA and the southeastern U.S.

1.2.8 Theory of planned behavior and rural population

The TPB has been used in the evaluation of nutrition and PA in the rural U.S.\textsuperscript{63,64} and as a construct for nutrition and PA interventions in low-resource environments.\textsuperscript{65-67} In the elicitation phase of a rural Virginia program to reduce the consumption of sugar-sweetened beverages (SSB), four themes emerged: taste, availability/convenience, habit/addiction, and cost which led to program planning to address the unique cultural and attitudinal beliefs of the population. The resulting SIPsmartER program decreased caloric intake from SSB and lowered body mass index (BMI) in the participants.\textsuperscript{68} Focus group discussions with rural, mid-Western women revealed that social and environmental factors combined with personal life situations were important facilitators and barriers for healthy eating, PA, and weight management. The women discussed the benefits of social support and accountability in behavior change efforts.\textsuperscript{64} DeBiasse and colleagues pilot-tested the use of an implementation intention with low-income women who reported that they liked having a choice in changing their behaviors, which aligned with the construct of PBC in the TPB.\textsuperscript{65} SNAP recipients in Alabama demonstrated that attitude is a predictor of consuming vegetables. With a recipe card and an attitude that consuming vegetables is beneficial to one’s quality of life, it increased the desire to cook and eat more vegetables.\textsuperscript{67} Recent research on SNAP-Ed recipients in Mississippi shows that low-resource Mississippians have knowledge of what is included in a healthy diet; however, barriers to healthy eating were expressed, such as the cost of healthy foods, convenience, taste, and time.\textsuperscript{57}
1.3. Statement of purpose

This research aims to map the evidence related to social marketing campaigns that promote healthy eating and improved PA to the U.S. low-income population and to characterize the program components when available (i.e., Andreasen’s benchmarks, use of behavior change theory, marketing mix, message framing, distribution channels, and outcome measures). Also, this research seeks to identify the preferences of low-income LA residents for BE strategies, specifically messengers, social norms, and commitments in future social marketing campaigns to improve vegetable intake. Finally, this research proposes to describe the attitudes, beliefs, and barriers of LA residents of rural, low-income environments about healthy eating.

1.4 Research questions

1. What are the key characteristics of social marketing campaigns designed specifically for low-income populations in the U.S. to promote healthy eating and PA behaviors?
2. Based on FGD, what are the attitudes, beliefs, needs, and/or barriers of the rural, low-income audience about healthy eating behaviors?
3. What are the preferences of the LA low-income population for BE strategies including messengers, social norms, and commitments in social marketing messages designed to increase the amount of vegetables served at meals?
4. Are there regional or other differences for preferences regarding messengers, social norms, and commitments in social marketing messages designed to increase the amount of vegetables served at meals in the LA low-income population? If so, describe those differences.

1.5 Hypothesis
This research will describe the beliefs, attitudes, barriers, and message design preferences regarding healthy eating behaviors in low-income residents in LA to provide insights for developing behavior change messages for future social marketing campaigns in LA.

1.6 Assumptions

Assumptions made prior to the FGD were:

1. The FGD is an effective method of determining attitudes, SN, PBC, and behavioral intentions in the rural low-income population.

2. Participants are truthful in their responses to the questions asked of the group.

3. The responses of the FGD participants are not influenced by the dynamics of the group.

4. Participants are representative of the target population, which is the rural low-income adult population in LA.

1.7 Limitations: FGD

The limitations of the FGD are:

1. The facilitator is not indigenous to the study population.

2. A convenience sample of volunteers is used for the FGD.

3. A small sample size may not be representative of the population.

4. The responses of the FGD participants may have been influenced by the dynamics of the group.

1.8 Assumptions: CA

The assumptions of the CA are:

1. The value of a product is equal to the sum of the value of its parts.⁶⁹
1.9 Limitations: CA

The limitations of the CA are:

1. A nonprobability sample of participants located in LA was obtained which may limit the generalizability of the results.

1.10 Objectives:

The objectives of the proposed research are:

1. To identify the available evidence and the key characteristics of social marketing campaigns for low-income audiences in the U.S. which promote healthy eating and PA through a scoping review of literature.

2. To identify attitudes, SN, PBC, and intention associated with healthy eating behaviors of the rural low-income adult population in LA through FGD.

3. To identify the preferences for messengers, commitments, and social norms in social marketing messages promoting vegetable intake for the low-income LA population using a survey and CA.

4. To compare the regional preferences of messengers, commitments, and social norms in social marketing messages promoting vegetable intake for low-income audiences in LA.

1.11 Methods

This dissertation will map the evidence related to social marketing campaigns that promote healthy eating and improved PA to the U.S. low-income population and characterize the program components when available (i.e., Andreasen’s benchmarks, use of behavior change theory, marketing mix, message framing, distribution channels, and outcome measures). Also, this research describes the attitudes, beliefs, and barriers of LA residents of rural, low-income
environments about healthy eating. Lastly, this research identifies the preferences of low-income LA residents for BE strategies, specifically messengers, social norms, and commitments in future social marketing campaigns to improve vegetable intake. Methods which included a scoping literature review, a formative study, and a conjoint analysis survey are briefly described below.

1.11.1 Study 1: Scoping Literature Review of available evidence and key characteristics of mass (state-wide or community-wide) social marketing campaigns for healthy eating and PA in low-income audiences

A literature search was conducted to identify the availability of evidence and the key characteristics of social marketing campaigns that promote healthy eating and PA for low-income in the U.S. Search terms included “rural,” “social marketing,” “health promotion,” and others consistent with predetermined search criteria. Databases included Academic Search Complete, Business Source Complete, the Cumulated Index to Nursing and Allied Health Literature – Complete (CINAHL), and PubMed. Data were reported in accordance with the “Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.” After screening the articles, the author and one reviewer independently performed the assessment of criteria for the inclusion of publications in the review. Data charting was completed by the author and verified by an independent reviewer. The included articles were presented in tables describing pertinent information regarding the availability of evidence and the characteristics of the social marketing campaigns described in the publications.

1.11.2 Study 2: Focus group discussions to determine perspectives of the rural low-income adult population

Because 45% of parishes in LA are classified as nonmetropolitan and encompass rural geographies where people may be at greater risk of developing diet-related diseases than residents of urban areas, FGDs were performed in rural LA parishes with low-income
participants age of eighteen and older. Demographic data was collected from the participants including name, age, city of residence, parish of residence, number of children in household under 18 years old, sex, racial or ethnic group(s), SNAP benefit participation, occupation, and education level. The FGDs were recorded, and written notes were made regarding nonverbal communication. Open-ended questions for the FGD were peer-reviewed based on the TPB and included the assessment of behavioral attitudes, subjective norms related to healthy eating and PA, perceived behavioral control with eating and PA practices, and intentions to perform healthy nutrition and PA behaviors. Data were transcribed and analyzed for themes based on the Constant Comparative Method for Qualitative Analysis. All data were reported to the SNAP-Ed state office team for the future development of social marketing campaigns.

1.1.3 Study 3: Conjoint analysis to identify preferred BE interventions in low-income adult LA residents

Results from the scoping literature review about social marketing campaigns that promote healthy eating in the U.S. low-income population and the MINDSPACE framework were used to develop a CA survey about message design preferences. The research was a factorial design with a messenger attribute (5 levels) and a message attribute (including commitments and social norms) promoting vegetable consumption. SNAP-Ed nutrition educators participated in a FGD to confirm the attributes and levels for the CA and to ensure understanding for the broader audience. An online survey was developed to administer the CA questionnaire. A sample survey question appeared as a stock photo with a detailed scenario depicting a messenger (“your healthiest friend”) paired with a norm or a commitment statement. Using a scale, the participant rated the scenario for its likelihood to inspire serving more vegetables at meals. The parameters of regression analysis estimated the strength of preference for each messenger, social norm, and commitment in the social marketing messages.
Demographic questions were included in the survey to assess covariates with the message and messenger variables. Each research study is discussed in detail in future chapters of this dissertation.
CHAPTER 2. SOCIAL MARKETING CAMPAIGNS TO PROMOTE HEALTHY EATING AND IMPROVED PHYSICAL ACTIVITY IN U.S. LOW-INCOME ENVIRONMENTS: A SCOPING LITERATURE REVIEW

2.1 Introduction

Since evidence regarding social marketing campaigns in low-income audiences is emerging, a scoping review is appropriate to identify relevant literature and its focus, as well as to map the scope of the evidence.\textsuperscript{74} The purpose of this scoping literature review is to collect information related to social marketing campaigns in the U.S. that aim to promote healthy eating and improved PA in low-income environments and to inform the future development of effective social marketing campaigns in LA. Consumption of health-promoting foods including fruit and vegetables is consistently less than adequate for adults in the U.S.,\textsuperscript{31,75} and it may be more challenging in low-income environments where decreased access to healthy foods in retail stores may reduce purchases.\textsuperscript{76-80} Also, residents in low-income environments report few convenient and safe places to exercise, time constraints, and family commitments which reduce participation in PA,\textsuperscript{81-86} yet routine PA may prevent chronic diseases and is also beneficial for health.\textsuperscript{33,34,87,88}

Social marketing campaigns are one intervention that the SNAP-Ed employs to promote the consumption of nutritious foods and engagement in PA consistent with the Dietary Guidelines for Americans (DGA) which may lower risk of chronic diseases and obesity.\textsuperscript{2,28,29,33,34,87-90}

Social marketing campaigns are a cost-effective intervention to reach a community or state-wide audience with persuasive nutrition messages to promote healthy eating and improved PA.\textsuperscript{91} According to Andreasen, “Social marketing is the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of the society of which they are a part.”\textsuperscript{41} While social marketing is differentiated from commercial marketing in its focus on behavior change at the
individual and community levels, both share similar underlying constructs. Andreasen’s six essential criteria of social marketing are behavior change objective(s), formative research, audience segmentation by unique factors to tailor interventions, use of Exchange Theory, marketing mix or the 4 P’s (product, price, place, and promotion), and attention to competitors for the desired behavior. A brief explanation of Andreasen’s criteria follows.

Formative research is necessary to ascertain the beliefs and attitudes of the audience for the development of persuasive messages that will resonate with the target population. During campaign development, social marketers analyze and segment the campaign’s target audience into different intervention groups based on cultural, demographical, behavioral, and other factors to tailor the interventions to the needs of each group (e.g., to accommodate linguistic or communication preferences). Exchange theory refers to presenting the audience with a new behavior and its benefits so that the audience perceives the new behavior is more beneficial than the current behavior. The marketing mix of the four Ps – “product,” “price,” “place,” and “promotion”- is used to position the program for implementation. The product is the new behavior that will be promoted, such as eating more vegetables. The price is the participant’s cost to change the behavior, e.g., time spent shopping or the cost of new foods. The place is where the behavior change will occur, such as a restaurant or a grocery store. The promotion is the social marketing messages and interventions that encourage behavior change via distribution channels that are preferred by the target audience. Lastly, an evaluation of the program’s effectiveness and sources of competition to the desired behavior are ongoing. Efforts are made to reduce opportunities for the audience to engage in behaviors that may compete with the desired behavior change.
Adherence to a relevant behavior change theory during program development and implementation improves the effectiveness of health-promoting social marketing campaigns.\textsuperscript{93,94} Also, the context and approach used to communicate social marketing messages or the message frame, may increase the probability of behavior change. For example, one type of message frame uses a loss- or gain-framed perspective to increase the likelihood that the message recipient engages in the desired behavior.\textsuperscript{95} A gain-framed message emphasizes the benefits of changing health habits, and a loss-framed message accentuates the consequences of not changing health habits. Gain-framed messages with short-term outcomes related to social or mental health are preferred for messages to improve PA.\textsuperscript{94,96} Findings supporting the use of gain-framed messages to promote healthy eating are inconclusive.\textsuperscript{96-100}

While individual (e.g., beliefs, genetics, and lifestyle) and environmental factors (e.g., healthy food availability and affordability) play a role in the development of obesity and chronic disease,\textsuperscript{101} social marketing campaigns may influence beliefs and promote behavior change related to eating and PA which may lead to improvements in health. However, peer-reviewed literature about effective social marketing campaigns for healthy eating and PA in low-income communities of the U.S. is limited. Literature reviews include limited publications about social marketing campaigns in the U.S. low-income environments regarding PA (n = 5)\textsuperscript{93} and (n = 2)\textsuperscript{102} and healthy eating (n = 2).\textsuperscript{60} This scoping review aims to map the evidence related to social marketing campaigns for the U.S. low-income population and characterize the program components when available (i.e., Andreasen’s benchmarks, use of behavior change theory, marketing mix, message framing, distribution channels, and outcome measures). The purpose of this review is to provide an overview of what is known about social marketing campaigns that
promote healthy eating and improved PA behaviors to the U.S. low-income population including distinctions by rural and urban geography.

2.1.2 Research questions

Using the Population, Concept, Context (PCC) method to delineate the main questions of the review, the population is the low-income population (all ages) residing in the U.S.\textsuperscript{103} The concept that the scoping review is investigating is social marketing campaigns in the context of healthy eating and improved PA. The research questions to be considered are:

1. What is known about social marketing campaigns that promote healthy eating and improved PA behaviors to the low-income population residing in the U.S.?

2. What are the gaps in the research literature for social marketing campaigns aiming to promote healthy eating and improved PA behaviors in low-income populations in the U.S.?

3. Are there differences in the literature regarding social marketing campaigns for healthy eating and improved PA in low-income rural and urban geographies? If so, describe the differences.

2.2 Methods

This scoping review is registered on the Open Science Framework (\texttt{10.17605/OSF.IO/EUG2P}), and the researcher followed guidelines established by the JoAnna Briggs Institute in the completion of the review.\textsuperscript{103} The researcher performed searches in Academic Search Complete, Business Source Complete, the Cumulated Index to Nursing and Allied Health Literature – Complete (CINAHL), and PubMed.
2.2.1 Eligibility criteria

Publications met inclusion criteria if they were published between January 1, 2005 and February 20, 2021, available in English, used the term “social marketing” to describe an intervention or program and contained a formative, qualitative, or quantitative evaluation (such as a process, program, or impact evaluation) of a social marketing program about healthy eating or PA targeting a low-income population in the U.S. To meet the criteria for low-income settings, the publication had to include one of the following: 1) participants were eligible for SNAP, the Special Supplemental Program for Women, Infants, and Children (WIC), or Head Start, or were public assistance recipients, 2) median household income was less than or equal to 80% of state median income using intervention year,\textsuperscript{104} 3) poverty rate of the county/community was higher than the state or national average during the intervention year, or 4) a clear explanation of why the location of the study was considered in a “low-income” area. Publications were excluded if: 1) a publication in English was not available, 2) “social marketing” was not included in the description of the intervention, 3) the publication did not target participants residing in a low-income area, or 4) the publication did not include an evaluation of a social marketing campaign.

2.2.2 Search strategy

A research librarian informed the search strategy that included four databases and gray literature in two separate contexts: social marketing for healthy eating and social marketing for PA. Existing literature reviews included a few campaigns targeting low-income populations for PA dating from 1992-2016\textsuperscript{44,102,105} and healthy eating from 2000-2012\textsuperscript{60}; thus, the time frame for the search was established between January 2005 – February 2021. The researcher searched
Academic Search Complete, Business Source Complete, Cumulated Index of Nursing and Allied Health Literature (CINAHL), and Pubmed®.

1. Academic Search Complete, Business Source Complete, CINAHL for healthy eating:
   ("diet, healthy" or "healthy eating" or "healthy diet*" or "food habits" or "food choice*"
   or fruit* or vegetable* or nutrition or "SNAP" or "Supplemental Nutrition Assistance Program") AND ("social marketing" or "social market*" or "social marketing theory" or formative or "mass media" or "social media campaign" or "health promotion*" or behavior* or messag*) AND ("rural population" or rural or "rural community" or "urban population" or urban or "urban community") AND ("United States" or "North America" or "United States of America") AND (Poverty or "low-income" or "low-income population" or indigen*)

2. Academic Search Complete, Business Source Complete, CINAHL for PA:
   ("physical* activ*" or obesity or exercise or "SNAP" or "Supplemental Nutrition Assistance Program") AND ("social marketing" or "social market*" or "social marketing theory" or formative or "mass media" or "social media campaign" or "health promotion*" or behavior* or messag*) AND ("rural population" or rural or "rural community" or "urban population" or urban or "urban community") AND ("United States" or "North America" or "United States of America") AND (Poverty or "low-income" or "low-income population" or indigen*)
3. Pubmed for healthy eating:

("diet, healthy" or "healthy eating" or "healthy diet*" or "food habits" or "food choice*" or fruit* or vegetable* or nutrition or "SNAP" or "Supplemental Nutrition Assistance Program") AND ("social marketing" or "social market*" or "social marketing theory" or "mass media" or "social media campaign" or "health promotion*" or behavior* or messag*) AND ("United States" or "North America" or "United States of America") AND (Poverty or "low-income" or "low-income population" or indigen*)

4. Pubmed for PA:

("physical* activ*" or obesity or exercise or "SNAP" or "Supplemental Nutrition Assistance Program") AND ("social marketing" or "social market*" or "social marketing theory" or "mass media" or "social media campaign" or "health promotion*" or behavior* or messag*) AND ("United States" or "North America" or "United States of America") AND (Poverty or "low-income" or "low-income population" or indigen*)

The ProQuest Dissertations and Theses database (first 1000 results) and these websites were searched for grey literature: SNAP-Ed, National Institute for Food and Agriculture (NIFA), U.S. Department of Agriculture (USDA), WIC, and Expanded Food and Nutrition Education Program (EFNEP). The grey literature search and findings were used to identify peer-reviewed publications for inclusion in the review. Also, the search process included handsearching of reference lists of included articles and reviewing pertinent publications from authors who study healthy eating and PA in low-income audiences.

Searches from Pubmed, Academic Search Complete, Business Source Complete, and CINAHL were downloaded directly into Endnote (x9.2, UK: Clarivate, 2021). Duplicates were removed, and a researcher screened all publications by title and abstract for inclusion in the full-
text review. The researcher conducted a full-text review of eligible publications for inclusion in the literature review, documenting reasons for exclusion in EndNote. After this, the researcher hand searched reference lists of included full-text articles for potential publications and searched for gray literature. A reviewer verified the full-text articles and the hand searched publications for inclusion in the scoping review. Also, the researcher and reviewer read articles obtained from experts in the field to determine if they met inclusion criteria. An additional reviewer was available to discuss all discrepancies regarding inclusion of articles for full-text review as needed. However, only minor discrepancies were found and were resolved without the additional reviewer.

2.2.3 Data charting and synthesis

The researcher developed a data charting form (Appendix A), piloted it on five publications, and made two minor revisions to the template. Data charting was completed by one researcher and entered in two spreadsheets, and a second reviewer verified the data charting. One spreadsheet included the following data on each included publication: location, geography, campaign name, study aim, study design, theoretical framework, target audience, number of participants, features of social marketing program, intervention type (dietary or PA), outcome measures, duration, and findings. If not identified in the publication, geography was determined using the Rural-Urban Continuum Codes with 1-3 as urban and 4-9 as rural locations. The second spreadsheet included the following information: campaign name, 4 P’s (produce, place, price, promotion), Andreasen’s criteria for social marketing (behavioral objective, audience segmentation, formative research, Exchange theory, marketing mix, and competition), message frame, distribution and recruitment channels (print media, billboard, television, radio, website, social media, digital media, text message, grassroots, telephone or mobile technology,
bus/subway, and school, home, grocery, and community environments), and use of professional marketing services (Appendix A).

2.3 Results

Of the 2572 publications screened, 107 studies were assessed for eligibility resulting in the inclusion of 37 publications in this review about social marketing campaigns which promote healthy eating and PA in U.S. low-income environments (Figure 2.1). Most publications which were excluded lacked pertinent data based on title and abstract or did not meet the criteria for an evaluation of a social marketing campaign. This review (N = 37 studies) represents 30 different social marketing campaigns. Twenty-one of the publications addressed dietary behaviors, and the remaining discussed a combination of diet and PA (n = 10) and PA behaviors (n = 6). Forty-nine percent of the publications were formative or qualitative research (n = 18), followed by experimental research (n = 10), process evaluations (n = 7), program evaluation (n = 1), and one literature review (Figure 2.2). The publications represented social marketing in rural (n = 13), urban (n = 9), a combination of rural and urban (n = 9), and statewide (n = 6) geographies. Most of the publications were in the southern U.S. (n = 19) followed by western U.S. (n = 13), northeastern U.S. (n = 3), midwestern U.S. (n = 2) (Figure 2.3). Of the nineteen studies in the South, eight were in rural locations. One study included participants from Texas, California, Mississippi, and Hawaii. Results represented social marketing development and implementation for children (age 3-17, n = 9), adults (age 18 and older, n = 26), and both children and adults (n = 2). Most of the studies were published between 2016 – 2020 (n = 18) and 2005 - 2010 (n = 12). The main characteristics of the publications are included in Table 2.1. Thirty-one (84%) of the studies (dietary, n = 17; PA, n = 5; dietary and PA, n = 9) reported using one or more theoretical approaches to guide the social marketing development or implementation, and social marketing
theory (n = 22) was the most frequently cited theory followed by social cognitive and social learning theories (n = 9), socioecological model and ecological framework (n = 5), transtheoretical model (n = 2), theory of planned behavior (n = 2), source similarity (n = 1), health marketing (n = 1), and mere exposure theory (n = 1).

Figure 2.1. PRISMA diagram of study screening process and article selection for publications included in the scoping review of social marketing campaigns aiming to promote healthy eating and improve physical activity in low-income environments.
Research Designs for Social Marketing Publications in US Low-Income Environments

Figure 2.2. Distribution of research designs included in the scoping literature review of social marketing campaigns aiming to promote healthy eating and improve physical activity in low-income environments
Figure 2.3. Location of publications in scoping literature review for social marketing campaigns to promote healthy eating and improved physical activity in U.S. low-income populations
Table 2.1. Summary of publications in scoping review for social marketing campaigns to promote healthy eating and improved physical activity in low-income U.S. populations

<table>
<thead>
<tr>
<th>Reference</th>
<th>Location, Geography</th>
<th>Study Design</th>
<th>Target audience</th>
<th>Dietary intervention</th>
<th>PA intervention</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldoory (2016)&lt;sup&gt;106&lt;/sup&gt;</td>
<td>mid-Atlantic state, rural</td>
<td>Qualitative</td>
<td>Rural low-income mothers in a mid-Atlantic state.</td>
<td>y&lt;sup&gt;A&lt;/sup&gt;</td>
<td>y</td>
<td>People were more engaged at the beginning of intervention. Almost half of the participants liked getting messages from a similar persona.</td>
</tr>
<tr>
<td>Bachar (2006)&lt;sup&gt;107&lt;/sup&gt;</td>
<td>North Carolina, rural</td>
<td>Program Evaluation</td>
<td>Eastern Band of Cherokee Indians including children and adults</td>
<td>y</td>
<td>y</td>
<td>Participants (n= 150) walked an average 211 miles. 70% of worksite wellness participants lost weight and decreased their BMI.</td>
</tr>
<tr>
<td>Bellows (2006)&lt;sup&gt;108&lt;/sup&gt;</td>
<td>Colorado, rural, urban</td>
<td>Formative research</td>
<td>Colorado Head Start families - primary audience is children; secondary audience is parents</td>
<td>y</td>
<td></td>
<td>Developed a bilingual tagline (English/Spanish), a message for parents, a graphic depicting a family eating together, and educational resources to aid parents introduce new foods at home.</td>
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<sup>A</sup>y = yes

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<tr>
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<th>PA intervention</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellows (2008)</td>
<td>Colorado, rural, urban</td>
<td>Formative research</td>
<td>3–5-year-old children, parents, and teachers</td>
<td>y</td>
<td>y</td>
<td>Both rural and urban groups agreed on the need for indoor activities for PA. Developed marketing strategies for PA programs for preschoolers while at school and at home.</td>
</tr>
<tr>
<td>Bellows(2009)</td>
<td>Colorado, rural, urban</td>
<td>Formative research</td>
<td>3–5-year-old children, parents, and teachers</td>
<td>y</td>
<td></td>
<td>Superhero graphics, program concepts, and materials were developed for the program.</td>
</tr>
<tr>
<td>Blitstein (2016)</td>
<td>Iowa, statewide</td>
<td>Quasi-experimental</td>
<td>3rd grade children and their parents from low-income schools</td>
<td>y</td>
<td></td>
<td>Nutrition education plus social marketing group increased mean fruit consumption by 0.17 cups (P = 0.03), mean vegetable consumption by 0.13 cups (P = 0.02). Intervention group was more likely to drink low-fat/fat-free milk (P = 0.05).</td>
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<tbody>
<tr>
<td>Buchthal (2011)(^{112})</td>
<td>Hawaii, statewide</td>
<td>Process evaluation</td>
<td>Low-income adult Hawaii residents</td>
<td>y</td>
<td>y</td>
<td>Campaign awareness was lower among low-income participants (47%, P &lt; .001). Recall of supermarket-based messages was higher in the lower income participants.</td>
</tr>
<tr>
<td>Coulon (2012)(^{113})</td>
<td>South Carolina, rural</td>
<td>Process evaluation</td>
<td>African American Adults living in low-income communities</td>
<td>y</td>
<td></td>
<td>Trail walkers increased (n = 424/month) in the intervention group. Walkers reported social interaction was the primary reason for participation.</td>
</tr>
<tr>
<td>Criss (2019)(^{114})</td>
<td>Massachusetts, urban</td>
<td>Process evaluation (case study)</td>
<td>Children age 2-12</td>
<td>y</td>
<td>y</td>
<td>The Summer Passport Program for parks increased participation in PA and summer lunch programs. Text messaging had low participation due to procedural issues.</td>
</tr>
<tr>
<td>Reference</td>
<td>Location, Geography</td>
<td>Study Design</td>
<td>Target audience</td>
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<td>PA intervention</td>
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<tr>
<td>Curran (2005)(^{15})</td>
<td>White Mountain and San Carlos Apache reservations in Arizona, rural</td>
<td>Process evaluation</td>
<td>American Indian residents</td>
<td>y</td>
<td>Availability of promoted foods was 78%. Tribal budgetary issues decreased purchases of promoted foods. In-store cooking demonstrations and taste tests were well-received.</td>
<td></td>
</tr>
<tr>
<td>DeWitt (2017)(^{16})</td>
<td>Kentucky, rural</td>
<td>Cross-sectional survey (post-intervention)</td>
<td>Primary shoppers at farmers markets in 6 rural counties</td>
<td>y</td>
<td>Participants who recalled PIUKP and ate a sample food were more likely to want to prepare the food at home.</td>
<td></td>
</tr>
<tr>
<td>Dharod (2011)(^{59})</td>
<td>Oxford Hills, Maine, rural</td>
<td>Formative research</td>
<td>Low SES moms with children living in rural counties</td>
<td>y</td>
<td>Developed interventions to improve social support, including a PA buddy program, cooking club, and a produce buying club. Planned a newsletter with information to improve fruit and vegetable consumption and PA levels.</td>
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<tbody>
<tr>
<td>Evans (2011)</td>
<td>Chicago, Illinois, urban</td>
<td>Randomized controlled study</td>
<td>Parents of children age 3-7 years of age living in low-income communities</td>
<td>y</td>
<td>y</td>
<td>Vegetable servings/day increased (0.33 to 1.16 servings, P &lt; .0001). Dairy consumption increased (milk P = .0010, cheese P &lt; .0001, yogurt P &lt; .0001). Screen time was high (&gt; 3 hours/day). PA was generally below recommended daily levels but number of days of vigorous PA in the past 7 days increased (p &lt; .0001). Brief counseling about 5-4-3-2-1 Go! increased fruit and vegetable consumption (OR = 1.759, P = 0.049).</td>
</tr>
<tr>
<td>Finnel (2017)</td>
<td>Oklahoma City, Oklahoma, urban</td>
<td>Formative research (mixed methods)</td>
<td>Low-income whole and 2% milk users</td>
<td>y</td>
<td></td>
<td>Key social marketing messages included (1) “1% milk is not watered-down,” (2) “1% milk has the same vitamins and minerals as 2% and whole milk,” and (3) “2% is not low-fat milk.” Researchers decided to promote 1% milk rather than “low-fat” milk.</td>
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<tr>
<td>Finnell (2018)</td>
<td>Oklahoma City,</td>
<td>Cross-sectional surveys (pre-</td>
<td>SNAP recipients age 18-50 years</td>
<td>y</td>
<td></td>
<td>Self-reported purchases of 1% milk increased (P = .02). The proportional increase in low-fat milk use was significant in urban areas (P = .03), but not in rural areas. Milk nutrition knowledge improved (P &lt; .004). Urban, White SNAP recipients preferred the intervention more than rural, White SNAP participants (P = .004).</td>
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<td></td>
<td>Oklahoma, rural,</td>
<td>and post-intervention)</td>
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<td></td>
<td>urban</td>
<td></td>
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<tr>
<td>George (2016)</td>
<td>central Brooklyn,</td>
<td>Process evaluation (mixed</td>
<td>Black and/or Hispanic men and women 18 to 64 years</td>
<td>y</td>
<td>y</td>
<td>Reached most people through social media and eblasts. 41% of the post-survey respondents recognized campaign marketing materials.</td>
</tr>
<tr>
<td></td>
<td>east New York City,</td>
<td>methods)</td>
<td>of age</td>
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<td></td>
<td>urban</td>
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<tr>
<td>Gustafson (2019)</td>
<td>Kentucky, rural</td>
<td>Quasi-experimental</td>
<td>Primary shoppers in 6 rural communities</td>
<td>y</td>
<td>y</td>
<td>Amount of daily fruit and vegetable servings increased (fruit, P = .03), (vegetable, P = .04). Frequency of weekly shopping at farmers markets increased from 7% to 12%.</td>
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<tr>
<td></td>
<td>rural</td>
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</tr>
</thead>
<tbody>
<tr>
<td>Hagues (2018)</td>
<td>Georgia, statewide</td>
<td>Formative</td>
<td>SNAP-ED eligible population in Georgia</td>
<td>y</td>
<td>Major barrier to eating healthy is access to available and affordable healthy food in rural areas resulting in shopping at convenience stores for most groceries or outshopping. Internet use varied by rural or urban geography. All groups reported using text messaging. Access to TV or newspaper may be limited due to expense. Billboards were mentioned in the rural districts. Transportation to nutrition education was an issue in rural areas.</td>
</tr>
<tr>
<td>Hampson (2009)</td>
<td>Oregon, rural</td>
<td>Formative research</td>
<td>Low-income women over age 18 caring for young children under age 13</td>
<td>y</td>
<td>Identified themes about nutrition including cost-consciousness, convenience, social influences, and health issues. Price of food was a major factor in decisions about nutrition.</td>
</tr>
</tbody>
</table>

Table cont’d.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Location, Geography</th>
<th>Study Design</th>
<th>Target audience</th>
<th>Dietary intervention</th>
<th>PA intervention</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harrison (2005)(^{123})</td>
<td>California, urban</td>
<td>Formative research</td>
<td>Low-income Chinese, Vietnamese, and Hmong Americans</td>
<td>y</td>
<td>y</td>
<td>Recommendations included 1) reinforce traditional Asian diets, 2) focus outreach to the mothers, and 3) utilize ethnic media, especially television and radio as distribution channels.</td>
</tr>
<tr>
<td>Hinkle (2008)(^{124})</td>
<td>California, rural, urban</td>
<td>Uncontrolled pre/post test</td>
<td>Milk purchasers in 2 low-income, Hispanic/Latino communities.</td>
<td>y</td>
<td></td>
<td>In rural CA, whole milk sales decreased (P = .005) and low-fat milk sales increased (P &lt; .001). In urban CA, whole milk sales decreased in Wave I (P &lt; .001) but increased in Wave 2 (P = .013). Sales of reduced-fat (P &lt; .001) and low-fat milk (P = .003) increased in Wave 1, but did not maintain in follow-up.</td>
</tr>
<tr>
<td>Johnson (2007)(^{125})</td>
<td>Colorado, rural, urban</td>
<td>Quasi-experimental</td>
<td>3–5-year-olds in a low-income preschool environment</td>
<td>y</td>
<td></td>
<td>Children in experimental groups had increased liking for new foods and more willingness to taste new foods (P &lt; 0.05).</td>
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</tr>
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<tbody>
<tr>
<td>Johnson (2019)²⁶</td>
<td>Colorado, rural</td>
<td>Quasi-experimental</td>
<td>4–7-year-old children in a low-income preschool environment</td>
<td>y</td>
<td>Intake improved more in the intervention group (P &lt; 0.0001). In the intervention group, children who liked the target food ate more of it at post-intervention (P &lt; 0.0001) and maintained the higher intake (P &lt; 0.0001).</td>
</tr>
<tr>
<td>Leone (2012)²⁷</td>
<td>North Carolina, rural, urban</td>
<td>Formative Research</td>
<td>Low-income adults</td>
<td>y</td>
<td>Social marketing messages which highlight the benefits of shopping at farmers' markets, such as price and acceptance of EBT, nutritional quality of produce, and freshness of locally grown foods may improve the campaign's resonance with consumers.</td>
</tr>
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Table cont’d.
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</tr>
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<tbody>
<tr>
<td>Liu (2017)¹²⁸</td>
<td>Kentucky, rural</td>
<td>Cross-sectional survey (post-intervention)</td>
<td>Rural residents of rural counties</td>
<td>y</td>
<td></td>
<td>Survey participants who reported a recipe affected the purchase of ingredients in samples were more likely to consume higher amounts of fruit ($P = .04$; 95% confidence interval [CI], 1.03–7.94) than were those who reported that the recipe had no influence.</td>
</tr>
<tr>
<td>Loh (2018)¹²⁹</td>
<td>Baltimore, MD, urban</td>
<td>Process evaluation</td>
<td>Low-income African American caregivers (&gt;18 years old)</td>
<td>y</td>
<td></td>
<td>Social media implementation improved reach, dose, and fidelity with time. Text messaging increased reach and dose, but fidelity decreased over time.</td>
</tr>
<tr>
<td>Mathews (2020)¹³⁰</td>
<td>Mississippi, statewide</td>
<td>Formative research</td>
<td>SNAP eligible parents and caretakers of children</td>
<td>y</td>
<td></td>
<td>Participants voiced positive attitudes, beliefs, and accurate perceptions of what healthy eating means although they reported eating fruits and vegetables as being expensive. Nutrition labels and planning meals should be included in nutrition education in future campaigns.</td>
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<th>PA intervention</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mendoza-Vasconez (2016)(^{131})</td>
<td>international</td>
<td>Narrative Literature Review</td>
<td>Racial/ethnic minorities, people living in low-income environments, and individuals with physical disabilities</td>
<td>y</td>
<td></td>
<td>Strategies for recruitment in the low SES environment include mass media, word of mouth, enhancing traditional marketing with community-based participatory approaches, and social marketing. Multilevel and environmental interventions and appropriate technology such as texting and cell phones may improve the promotion of PA.</td>
</tr>
<tr>
<td>Necheles (2007)(^{132})</td>
<td>Los Angeles, California, urban</td>
<td>Qualitative and quantitative research using photovoice and multidimensional scaling analysis</td>
<td>Adolescents (13-17 years) living in low-income neighborhoods</td>
<td>y</td>
<td></td>
<td>The participants developed 3 posters depicting social marketing messages to address nutrition, stress in school, and stress in the community which were shared with schools, community partners, and others interested in disseminating the messages.</td>
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</thead>
<tbody>
<tr>
<td>Nuss (2017)&lt;sup&gt;133&lt;/sup&gt;</td>
<td>New Orleans,</td>
<td>Formative research - cross-sectional study design</td>
<td>SNAP participants</td>
<td>y</td>
<td></td>
<td>Sources of nutrition information were Women, Infants and Children (WIC) and the internet which were accessed by smartphones. A gap in knowledge existed about SNAP electronic benefit acceptance at local Farmer’s Markets.</td>
</tr>
<tr>
<td></td>
<td>Louisiana, urban</td>
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<tr>
<td>Pempek (2009)&lt;sup&gt;134&lt;/sup&gt;</td>
<td>Washington DC, urban</td>
<td>Cross-sectional, between-subjects examination</td>
<td>Low-income African American children age 9-10 years</td>
<td>y</td>
<td></td>
<td>Children in the healthy game condition ate more healthy snacks than children in the less healthy game condition. Ninety percent of children who played the healthier game chose at least 1 healthier snack (Chi square =13.38; P = .01).</td>
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<tr>
<td>Tietyen Mullins</td>
<td>Kentucky, rural</td>
<td>Quasi-experimental, mixed-methods design with a nonequivalent comparison group</td>
<td>Low-income mothers with children aged 6-18</td>
<td>y</td>
<td></td>
<td>Consumption of fruits and vegetables increased one-half cup each per day (P ≥ .002). CTET participation significantly increased fruits and vegetables served and eaten at family meals.</td>
</tr>
<tr>
<td>(2020)&lt;sup&gt;135&lt;/sup&gt;</td>
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<tbody>
<tr>
<td>Tobey (2016)(^\text{136})</td>
<td>Oregon, statewide</td>
<td>Formative and pre- post- intervention pilot test</td>
<td>SNAP- eligible adults</td>
<td>y</td>
<td>Beliefs (ease of getting family to eat fruit, time required to prepare healthful food, and expense of a diet with fruit and vegetables) changed from pre- to post-test (P &lt; .05). Intervention group had better name recall and message interpretation than control.</td>
</tr>
<tr>
<td>Tobey (2017)(^\text{137})</td>
<td>Oregon, statewide</td>
<td>Process evaluation</td>
<td>SNAP-eligible adults</td>
<td>y</td>
<td>36 % of tested recipes were approved by kids. Caregivers reported preparing at least 1 Food Hero recipe (72%). From 2012–2015, recipe page views, recipes comments, and web-based referral traffic increased.</td>
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Table cont’d.
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Van Duyn (2007)(^{138})</td>
<td>Texas, CA, Mississippi, Hawaii, rural, urban</td>
<td>Qualitative</td>
<td>Hispanic women, Hmong parents and children, and African American men and women from low-income environments; Native Hawaiian college students who were not necessarily low-income</td>
<td>y</td>
<td>y</td>
<td>Participants preferred strategies to improve social support and increase access to locations for PA. Program components for PA were preferred if they included group activities or partners, incorporated cultural elements, and were family oriented.</td>
</tr>
<tr>
<td>Wilson (2013)(^{139})</td>
<td>South Carolina, rural</td>
<td>Formative research</td>
<td>Older African American adults residing in an underserved area</td>
<td>y</td>
<td>y</td>
<td>Developed a grass roots social marketing campaign to improve security and access to a safe outdoor exercise path in a low income, ethnic minority community.</td>
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<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilson (2015)</td>
<td>South Carolina, rural</td>
<td>Nonequivalent control group design</td>
<td>African American adults from underserved communities who had no restrictions regarding physical activity</td>
<td>y</td>
<td>No significant difference in moderate to vigorous PA between communities or within communities over time. The number of trail users was consistently more in the intervention community with police patrols and a social marketing campaign.</td>
<td></td>
</tr>
</tbody>
</table>
Studies discussed Andreasen’s criteria for social marketing, including behavioral objectives (n = 33), audience segmentation (n = 31), formative research (n = 29), exchange theory (n = 5), marketing mix (n = 13), and competition (n = 5). Two studies discussed message framing with a focus on gain-framed messages about healthy eating. The most commonly discussed channel for recruitment of participants or distribution of social marketing materials was print media (n = 15) followed by radio (n = 8); text, telephone, or mobile technology (n = 7); social media (n = 6); television (n = 5); grassroots (n = 5); website (n = 5); billboard (n = 3); digital media (n = 2); and bus/subway (n = 2). Studies reported food shopping venues (n = 9 stores, n = 4 farmers’ markets), schools (n = 10), communities (n = 9), and homes (n = 5) as potential or actual recruitment and/or promotional environments for social marketing campaigns. Eight of the studies reported employing professional marketing services in campaign research and development.

Study outcomes for social marketing campaigns promoting healthy eating behaviors included self-reported consumption of fruit and vegetables, low or nonfat milk purchases or consumption, water intake, shopping behaviors, healthy snack selection, family meals, and preference and willingness to try new foods, change in liking of new foods, and change in consumption of new foods. Study outcomes for social marketing campaigns promoting improved PA included self-reported minutes of PA and accelerometry, psychosocial measures, trail use, walking attendance, screen time, and number of days of participation in PA. Outcomes from one program evaluation included children’s perceptions of school and peer relationships (self-report), shift in body weight and body mass index (BMI), change in mean BMI, and number of miles walked. Process evaluation outcomes included dose, reach, and fidelity of intervention components including
channels for promotion. Results of the studies are presented separately by children and adults and by context (healthy eating or PA or both) and discussed in the following narrative.

2.3.1 Social marketing campaign research in low-income environments – research question 1 (children)

2.3.1.1 Healthy eating in children

The Food Friends - Fun with New Foods® social marketing campaign was designed to increase preschool children’s motivation to eat unfamiliar foods, an important step in the development of a healthy diet by reaching a primary audience (low-income preschool children) and a secondary audience (adults and parents). Researchers based the campaign on Social Marketing and Social Cognitive theories, implemented Andreasen’s criteria, provided educational materials for reinforcement at home, and had professional marketing support. Bellows (2006) conducted formative research to develop a bilingual parent component to Food Friends which included messages to promote exposure to new foods at home and to establish channels for nutrition education and campaign materials. Low-income pre-school children showed increased preference for and willingness to eat new foods after exposure to Food Friends (P < .05). Longitudinal research about Food Friends showed children (age 4-7 years) who liked the target food ate more of it than controls (P < 0.0001), and they maintained the increase over time (P < 0.0001).

In a statewide assessment of third graders, Blitstein (2016) compared the effectiveness of a school-based nutrition education program to the same nutrition education program plus a parent-directed social marketing campaign. Campaign messages promoting healthy snacks and low-fat milk were distributed to parents in grocery stores, billboards, television, radio, community locations, and school-sponsored family events. According to parent reports,
children in the education plus social marketing group significantly increased fruit, vegetable, and low-fat milk consumption \((P = 0.05)\). In another study, researchers employed an advergame as a social marketing channel for urban low-income 9–10-year-old African American children \((N = 30)\). Advergames are online computer games designed to market a product. Children selected a greater number of healthy snacks after playing the Pac-Man advergame that marketed healthy snacks \((P = .01)\). Lastly, in a formative study, 13 -17-year-old children from low-income urban areas developed three social marketing messages which promoted a healthy diet and lower stress levels via print media.  

2.3.1.2 Physical activity in children

Bellows (2008, 2009) described the formative development of the PA component to Food Friends® nutrition program for preschool children. Both rural and urban parent/teacher groups reported the need for indoor activities for PA due to weather conditions. Teachers reported that inadequate time, limited classroom space, and lack of equipment for activities were obstacles to providing PA. Another related formative study focused on the development of superhero graphics, program concepts, and materials for the Food Friends Get Movin’ with Mighty Moves™ social marketing campaign.

2.3.1.3 Healthy eating and physical activity for children

Evidence at the process evaluation level for an urban social marketing campaign for children showed increased participation in a Summer Passport Program in local parks and at federal summer lunch programs. Use of Facebook advertisements to promote the campaign produced increased “likes”; however, the texting program, which intended to reinforce the behavioral goals of the program with the caregivers, had low participation due to procedural issues during registration.
2.3.2 Social marketing campaign research in low-income environments – research question 1 (adults)

2.3.2.1 Healthy eating in adults

Formative evidence exists for statewide\textsuperscript{13,130,136} and rural\textsuperscript{59,122} geographies that describes beliefs about healthy eating for low-income women with young children. Barriers to healthy eating included the cost of healthy food,\textsuperscript{13,59,122,130,136} time constraints,\textsuperscript{13,59,130} and influences of friends and family on food choices.\textsuperscript{59,122} Preferred social marketing distribution channels differ by geography and financial constraints which reduce internet or television access.\textsuperscript{13} The Food Hero campaign distributed social marketing messages using multiple channels including print media, billboards, website, social media, in-store promotions, and direct mail.\textsuperscript{136} Campaign developers provided Food Hero community kits to nutrition educators who promoted the social marketing campaign to SNAP participants. Food beliefs regarding time to prepare meals and the cost of fruit and vegetables improved in the intervention counties (P < .05).\textsuperscript{136} Evidence at the process evaluation level for the recipe component of the Food Hero campaign indicates that website activity increased regarding recipe views, comments, and web-based referral traffic.\textsuperscript{137} Also, 69\% of parents reported that children asked for specific Food Hero recipes. Thirty-six percent of recipes were rated as approved by children.

One barrier in the low-income population regarding shopping at farmers’ markets (FM) is a lack of information about SNAP benefit acceptance.\textsuperscript{127,133} Facilitators to promote shopping at FM include improved access to fresh fruit and vegetables, reduced food cost, and acceptance of SNAP electronic benefits. In rural areas, lack of transportation may also be a barrier to FM use.\textsuperscript{127} DeWitt (2017) studied the relationship between participants’ awareness of the Plate It Up Kentucky Proud (PIUKP) campaign and fruit and vegetable purchases.\textsuperscript{116} Shoppers who were
aware of PIUKP and tasted a healthy food sample at the FM were more than twice as likely to want to prepare the healthy recipe at home \( (P = .006) \). Also, the PIUKP campaign resulted in more reports of shopping at FM \( (P = .04) \) over time.\textsuperscript{121} In a related study, Liu (2017) reported a positive relationship between PIUKP recipe cards and purchases of produce in rural stores.\textsuperscript{128}

In-store social marketing interventions for rural American Indians including cooking demonstrations and taste tests were popular.\textsuperscript{115} Although local financial issues reduced healthy food stocking in stores and impacted the healthy food availability on the reservation, prioritizing in-store dietary promotions from least to most difficult was beneficial to enhance audience participation. Loh (2018) evaluated social media and text messaging programs that targeted caregivers in the Baltimore Healthy Communities for Kids (BHCK) program. The BHCK provided in-store nutrition interventions, and when coupled with social media and text programs to caregivers, the reach of the BHCK program increased.\textsuperscript{129}

Quasi-experimental evidence about social marketing programs that promoted healthy cooking and low-fat milk demonstrated effectiveness in adults.\textsuperscript{118,119,124,135} The eight-week Cook Together Eat Together (CTET) social marketing campaign in rural Kentucky was promoted through social media, neighborhood flyers, and word of mouth, and it provided “cooking socials” for mothers and young children featuring a cookbook with recipes and basic cooking skills. Participants increased the consumption of fruit and vegetables by one-half cup per day \( (P \leq .002) \). Finnell (2018) implemented the 1% Milk Has Perks! mass media campaign that increased self-reported purchases of 1% milk \( (P = .02) \) by SNAP participants.\textsuperscript{119} However, increases in low-fat milk purchases were significant in urban areas \( (P = .03) \) but not in rural areas. Both CTET and 1% Milk Has Perks! applied Andreasen’s criteria for social marketing, including the marketing mix and formative research.\textsuperscript{118} Hinkle (2008) adapted the 1% or Less Milk...
Campaign\textsuperscript{141} for Spanish-speaking California residents and distributed it through mass media resulting in increased 1% milk sales (rural, P < .001; urban, P = .001), but the effects were not sustained in urban areas.\textsuperscript{124} The 5-4-3-2-1 Go! Campaign increased the consumption of vegetables (0.33 to 1.16 servings/day, P < .0001) and increased dairy consumption (milk, P = .0010; cheese, P < .0001; yogurt, P < .0001) in adults.\textsuperscript{117}

2.3.2.2 Physical activity in adults

The Positive Action for Today’s Health (PATH) social marketing campaign promoted improved PA behaviors to African American adults residing in high crime rural neighborhoods by addressing access to a walking path, safety, and social connectedness.\textsuperscript{113,139,140} Formative research with community members was instrumental to the development of the grassroots strategy to improve safety through police patrols and access to walking.\textsuperscript{113} Using a grassroots strategy, the reach of the walking plus social marketing campaign grew over time and highlighted that social interaction was an important motivator for participation in the walking campaign.\textsuperscript{139} However, accelerometer results did not show a difference in moderate to vigorous PA after 24 months. Although the number of trail users increased tenfold after nine months in the walking plus social marketing group.\textsuperscript{140} In formative research to increase PA, focus group discussions (FGD) with African American, Hispanic, Hmong, and Native Hawaiian adults revealed preferences for PA strategies which improved social support through group activities, family, and community support. Most stated a need for more access to places for PA.\textsuperscript{138} In a narrative review, Mendoza-Vasconez (2016) reported that social marketing, word of mouth, mass media, and traditional marketing with community-based participatory approaches may be effective recruitment strategies for PA interventions, and the use of texting and cell phones may improve the promotion of PA in the low-income population.\textsuperscript{131}
2.3.2.3 Healthy eating and physical activity in adults

Qualitative evidence exists for a rural text-based message intervention where researchers created a virtual communication source who was perceived as demographically comparable to participants. Two health promotion messages (including nutrition and PA content) per week were sent via text to participants. Participants (51% and 75%) reported acting on nutrition and PA messages, respectively. One challenge may be maintaining participants’ interest in the program, as they were more engaged at the beginning of the intervention. Another study describes the development of the Oxford Hills Healthy Moms project in rural, high obesity counties. Social support for dietary and PA changes was provided through a PA buddy program, cooking club, and a fruit and vegetable discount buying club.

Campaign reach was assessed in process evaluations for social marketing campaigns that combined healthy eating and PA. In Hawaii, the Start.Living.Healthy statewide campaign was distributed widely using mass media, print media, and signage in supermarkets. Low-resource individuals had lower campaign awareness than higher income participants (47%, P < .001); however, low-resource participants demonstrated higher recall of supermarket-based messages. In an urban social marketing campaign to prevent obesity and diabetes widely distributed on social media, mass media, websites, and in the community (bus shelters, bus stations, and subways), 46% of participants identified the campaign in a random-street intercept.

Community-wide efforts of the PIUKP campaign for adults living in rural high obesity counties increased fruit servings from 2.17 to 2.94 (P = .03) and increased vegetable servings from 2.54 to 2.72 (P = .04); however, moderate to vigorous PA did not improve.
2.3.3 Social marketing campaign research in adults and children (combined) – research question 1

2.3.3.1 Healthy eating and physical activity in adults and children

Harrison (2005) conducted formative research with key informants, parents, and youth about dietary and PA behaviors of Asian immigrants to design an Asian Five A Day Campaign. Recommendations encouraged the use of traditional Asian diets, interventions directed to the mothers who often promote the family’s health, and promotion of increased PA. Ethnic television and radio were suggested as effective distribution channels.

Program evaluation findings from Bachar (2006) show that 70% of worksite wellness participants lost weight and decreased their BMI levels after a 3-year obesity and diabetes prevention and social marketing program (Cherokee Choices/REACH) for American Indians residing in rural North Carolina. The social marketing campaign included a 7-part television series that featured people who had diabetes. Three short television messages featured Cherokee community members who were engaged in healthy activities and included themes of family, spirituality, and tradition. Participants in a walking program (N = 150) averaged 211 miles each. Researchers implemented a mentoring program at the elementary school that addressed psychosocial issues and provided PA programs after school.

2.3.4 Evidence gaps in the literature – research question 2

Twenty-seven percent of studies were experimental (n = 7, diet; n = 1, PA; n = 2, diet and PA), which is insufficient to make recommendations regarding effective social marketing campaign strategies. Experimental studies were primarily quasi-experimental in design except for one randomized community trial. Forty-nine percent of the studies in this scoping review were formative or qualitative (n = 18), and the majority explored healthy eating behaviors in adult populations located primarily in rural and statewide campaigns. Program and process
evaluations (n = 8) were 22% of the publications. There was one narrative literature review that aimed to describe interventions in underserved populations, including those residing in low-income environments. An evidence map displays where the evidence has amassed and where it is missing based on publications included in the review (Figure 2.4, Figure 2.5).

2.3.5 Evidence about rural and urban environments – research question 3

The social marketing campaigns targeted rural (n = 13), urban (n = 9), or a combination of rural and urban audiences (n = 9), and most of the evidence was formative. Formative evidence from rural participants included barriers to the cost of food, time constraints, friend and family influences on food choices, and transportation issues (long distances to store or PA venues). Barriers to PA in rural and urban environments included lack of access to affordable and/or nearby places for PA and lack of indoor PA alternatives for young children. Participants in rural and urban environments requested additional social support to promote PA and healthy eating habits. One approach to meeting social support needs is via text messaging which was widely used by both rural and urban participants.

Most experimental studies in distinctly rural and urban geographies had at least one positive outcome. At least half of the studies in the rural and urban environments (n = 11 rural, n = 6 urban) reported the use of a behavior change theory to guide the campaign. Neither rural or urban studies addressed message framing, although framing was discussed in statewide and rural/urban combined studies. Rural publications discussed the use of radio and grassroots distribution channels more than urban. Rural interventions also were more likely to occur in schools, shopping venues, or community environments. Urban studies promoted healthy eating and PA using social media, digital media, text messages, and signs on buses or the subway.
### Healthy Eating

#### Formative/qualitative Process evaluation Program evaluation Experimental research

**Children 2-17 years**

- Bellows (2006)\(^{108}\)
- Bellows (2008)\(^{109}\)
- Necheles\(^{132}\)
- Criss\(^{114}\)
- Blitstein\(^{111}\)
- Johnson
- Johnson
- Pempek\(^{134}\)

**Adults 18 years and older**

- Hagues\(^{13}\)
- Mathews\(^{130}\)
- Tobey (2016)\(^{136}\)
- Aldoory\(^{106}\)
- Dewitt\(^{116}\)
- Dharod\(^{59}\)
- Hampson\(^{122}\)
- Liu\(^{128}\)
- Leone\(^{127}\)
- Finnell (2017)\(^{118}\)
- Nuss\(^{133}\)
- Tobey (2017)\(^{137}\)
- Buchtha\(^{112}\)
- Curran\(^{115}\)
- George\(^{120}\)
- Loh\(^{129}\)
- Hinkle\(^{124}\)
- Evans\(^{142}\)
- Gustafson\(^{121}\)
- Tietyen Mullins\(^{135}\)
- Finnell (2018)\(^{119}\)

**Children and Adults**

- Harrison\(^{123}\)
- Bachar\(^{107}\)
- State-wide
- Urban and Rural
- Rural
- Urban

Figure 2.4. Evidence map of publications for social marketing campaigns in U.S. targeting healthy eating behaviors in low-income environments
Physical Activity

<table>
<thead>
<tr>
<th>Formative/qualitative</th>
<th>Process evaluation</th>
<th>Program evaluation</th>
<th>Experimental research</th>
<th>Literature Review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children 2-17 years</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Bellows (2008)(^{109})</td>
<td>• Criss(^{114})</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Bellows (2009)(^{110})</td>
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| **Adults 18 years and older** |
| • Aldoory\(^{106}\) |
| • Dharod\(^{99}\) |
| • Wilson (2013)\(^{139}\) |
| • Van Duyn\(^{138}\) |

| **Children and Adults** |
| • Harrison\(^{123}\) |
| • Bachar\(^{107}\) |

- • State-wide
- • International
- • Urban and Rural
- • Rural
- • Urban

Figure 2.5. Evidence map of publications for social marketing campaigns in U.S. targeting improved physical activity in low-income environments

2.4 Discussion

2.4.1 Summary of main findings

This scoping review aimed to map the literature about social marketing campaigns promoting healthy eating and improved PA behaviors in U.S. low-income environments.

Research for healthy eating campaigns in adults predominated, and most of the evidence was at the formative or qualitative level in rural areas of the U.S. The use of psychological theory and Andreasen’s criteria regarding behavioral objectives, audience segmentation, and formative research were widely reported in the included studies. Many gaps exist in the social marketing
literature, especially for the campaigns aiming to improve PA behaviors in low-income children and adults. Also, evidence is lacking regarding the use of exchange theory, marketing mix, and competition, and message frames for healthy eating and PA behaviors in low-income populations.

Experimental research in adults showed social marketing campaigns increased the quantity of fruit and vegetables served and consumed at meals117,121,135 and improved low or nonfat milk purchases or consumption.117,119,124 Social marketing campaigns promoting improved PA in adults showed mixed results.117,121,140 More formative and experimental research about PA is needed to develop effective interventions to increase PA levels in adults and children. Experimental studies of social marketing campaigns promoting healthy eating behaviors for children reported significant improvements in the consumption of fruit, vegetables, and dairy111; healthy snacks134; preference and willingness to try new foods125; liking of new foods126; and amount of new foods consumed.126 Effective campaigns in children included parents and teachers as a secondary audience.111,125,126 More research is needed to improve additional healthy eating behaviors in the DGA, such as increasing the intake of whole-grain foods.

Process evaluations also provided insights into the nuances of distribution channels to reach residents of low-income environments. Campaign reach consistently increased over time with promotional channels that incorporated social media, text message programs, and websites.114,120,129,137 This is consistent with research about the increased use of smartphones to access the internet, text, and social media reported by low-income participants.13,106,131,133 Since the internet, cell phone, television, and newspaper access may differ by rurality and/or income level, multiple channels of distribution for promotion may be necessary to reach the low-income
In contrast to mass media, Buchthal reported that low-income participants had a higher recall of supermarket-based social marketing messages than other participants. In this review, store-based campaigns included cooking demonstrations, healthy food labeling, educational displays, food samples, recipes, and point-of-sale items which may have reinforced in-store social marketing messages. Further investigation is needed to determine which traditional and non-traditional distribution channels will provide the best campaign reach in the low-income population.

The findings from this review informed the Conjoint Analysis study which included message and messenger variables. The CA survey featured diverse message sources to portray demographically similar messengers to the participants. The commitment messages created for the CA survey were optimistic and action-oriented. In LA participants, exploring attitudes, beliefs, and barriers through formative research revealed similar barriers to healthy eating in other southern states with high rates of obesity and chronic disease included in this review. The barriers were the cost of healthy food, outshopping to obtain food, preferences for cultural foods which may be high in calories, and concerns about the taste of healthy foods.

2.4.2 Limitations and strengths

Due to the limitations of database searching, some publications may have been missed during the article identification phase. The database search was supplemented by handsearching existing literature reviews which were not specific to low-income populations except for one narrative review that was included. Reference lists of articles that met inclusion criteria and expert publications were reviewed for potential articles. Gray literature was also searched for peer-reviewed studies. A limitation of scoping reviews is that critical appraisal of the study quality is not required. Due to the heterogeneity of the data and the lack of experimental studies,
a systematic literature review and meta-analysis were not recommended. Thus, a scoping narrative review of the literature was written to describe the included studies. A strength of this review is the inclusion of qualitative research, experimental research, and published evaluations presented separately by context (healthy eating and PA social marketing campaigns) and by age of the target audience making the gaps in the literature evident. When the publication data were separated by geography, studies in the low-income environment were analyzed for differences found in rural and urban campaigns.

2.5 Conclusion

This scoping literature review generated an evidence map for social marketing campaigns that aimed to promote healthy eating and improved PA in U.S. low-income populations. More experimental studies about the effectiveness of social campaigns are needed to tailor healthy eating and PA interventions to low-income audiences of all ages and geographical locations. Evidence about effective social marketing campaigns to improve PA behaviors in low-income children and adults in the U.S. is lagging research about healthy eating behaviors in this population. Research about effective social marketing campaigns for healthy eating should be expanded to address more DGA and effective distribution channels for low-income residents especially in rural environments. This scoping review identifies current practices and research opportunities regarding social marketing campaigns that aim to improve healthy eating and PA in low-income audiences. Organizations, such as SNAP-Ed that develop nutrition programs and services for clients in low-income environments may be interested in the findings from this scoping review to inform future social marketing campaign development and channels of campaign material distribution.
CHAPTER 3. HEALTHY EATING IN LOW-INCOME RURAL LOUISIANA PARISHES: FORMATIVE RESEARCH FOR FUTURE SOCIAL MARKETING CAMPAIGNS

3.1 Introduction

Consuming a healthy diet that adheres to the Dietary Guidelines for Americans (DGA) is associated with decreased mortality in residents of low-income areas of the southern United States (US), even though higher obesity and chronic disease rates exist for the southeast U.S. region. Rural residents of the southeastern U.S. exhibit sufficient knowledge of a healthy diet, yet knowledge frequently does not translate into adequate intake of fruit, vegetables, whole grain foods, and dairy products. Environmental factors such as high prices of healthy foods and shortages of quality produce in rural stores reduce healthy food purchases. As a result, more rural residents are outshopping in search of variety, better quality, and lower prices of food. One barrier to healthy eating is readily available Energy Dense Nutrient Poor (EDNP) foods. The need for convenient meals, preferences of friends and family, and familiar taste predilections also influence food choices of low-income rural southeast U.S. residents. People living in rural and remote low-income environments outside of the U.S. report high prices of healthy foods, low quality of produce, readily available highly palatable EDNP foods, and the importance of maintaining traditional ways to obtain food, such as hunting, fishing, or gardening.

The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) provides direct nutrition education, comprehensive multi-level interventions, and community approaches (e.g., social marketing campaigns) to assist SNAP-eligible clientele to reach the DGA on a limited budget. SNAP-Ed social marketing campaigns designed to promote healthy eating demonstrate improved attitudes, such as positive beliefs and readiness to eat fruit and vegetables, and healthy behaviors (i.e., increased intake of lower fat milk among SNAP recipients). According to Andreasen, “Social marketing is the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of the society of which they are a part.” Beginning in 2014, nutrition educators at Louisiana Cooperative Extension Service developed and implemented two consecutive social marketing campaigns to promote healthy eating and improved PA throughout LA. An evaluation of Louisiana’s 2017-2018 campaign recommended improvements to the campaign’s reach for the young adult population via social media, increased television exposure, and more diversity in print media and recipes. It is important to promote healthy habits in young LA residents because health behaviors are established in youth and continue throughout life. In LA, 18–19-year-olds often reside with their parent(s) if their high school completion is prolonged, which was the case for 20% of LA high school students in 2018. Since adolescents are influenced by both their peers and parents, persuasive messages may need to address peer and parental norms and perceived behavioral control factors unique to adolescents.

Social marketing campaigns targeting low-income audiences have recently begun to use text messaging, internet, and social media to disseminate nutrition education, recipes, and supportive messages. Access to social support through social marketing campaigns may motivate adults to act on intentions consistent with healthy eating behaviors.
five percent of LA households lack internet access, and 42% lack broadband connectivity which has deterred the provision of social marketing campaign materials, nutrition education, and social support via the internet. Recently, the LA legislature established a task force to improve broadband connectivity throughout LA, especially in rural areas.

During the development of social marketing campaigns, researchers assess the target population’s beliefs and attitudes to optimally position the campaign messages with the intended audience. Formative research is also used to identify targeted foods, behaviors, and ideal timing of persuasive messages and interventions. Although research about healthy eating behaviors is available concerning rural communities in the southeast U.S., little is known about the barriers, attitudes, and beliefs of the rural, low-income population in LA. To address this deficiency in knowledge, further investigation is needed to describe factors related to healthy eating behaviors. Using the Theory of Planned Behavior (TPB), this research aimed to give details about the attitudes, subjective norms, perceived behavioral control beliefs, and intentions of the rural low-income LA population regarding healthy eating to inform future social marketing campaigns in this state.

Fishbein and Ajzen introduced the Theory of Reasoned Action to demonstrate that behavior is based on volition and intention; thus, it postulates that behavioral and normative beliefs are key in the formation of a behavioral intention, which may result in a behavior change. In 1985, Ajzen furthered this theory by adding perceived behavioral control to account for the resources and opportunities that the person believes they possess to change the behavior. Known as the TPB, it suggests that human behavior is steered by the combination of (1) behavioral beliefs leading to attitudes about the behavior, (2) normative beliefs leading to subjective norms or social expectations to execute or not execute the behavior, and (3) control
beliefs leading to perceived behavioral control or self-efficacy to perform the behavior. These factors coalesce to form an individual’s behavioral intention, which leads to the performance of the behavior if enough actual behavioral control exists. The TPB is often used by social marketers to assess individual factors that influence planned behaviors (i.e., barriers) in order to develop persuasive messages and approaches that shape beliefs which may improve the performance of the desired behavior. The TPB has been employed in the assessment of nutrition behaviors in rural Virginia and the rural mid-Western U.S., while also being used as a framework for nutrition interventions in low-income populations. The TPB is widely researched and shown to be an appropriate framework to assess and promote healthy eating behaviors of rural, low-income populations in the U.S.

3.2 Materials and methods

A multiple case study approach in LA parishes (N = 3 cases) with focus group discussions (FGD) was used. Working from a constructivist epistemology with Grounded Theory methods, an inductive process to categorize and develop themes from the data was employed. Applying the more flexible Charmaz method of Grounded Theory encouraged the exploration of multiple realities of participants.

A purposive sample was obtained by identifying SNAP-Ed census tracts in rural parishes delineated by levels 4–9 of the Rural-Urban Continuum Codes (RUCC). SNAP-Ed nutrition educators arranged two FGD in North LA (Winn Parish and Concordia Parish) and one FGD in South LA (Washington Parish), and the nutrition educators recruited community residents who were at least 18 years of age, English-speaking, and willing to give consent to participate. Winn Parish, Concordia Parish, and Washington Parish have poverty levels of 18.7%, 25%, and 24.4%, respectively, and the LA poverty level is 19.2%.
obesity and diabetes prevalence rates that exceed the LA rates for obesity (34.52%) and diabetes (11.1%).\textsuperscript{171,172}

The TPB guided the development of 10 open-ended FGD questions to identify new information about attitudes, beliefs, barriers, and intentions of the rural, low-income audience regarding eating habits and making changes to nutrition behaviors.\textsuperscript{14,72} These questions were peer-reviewed (Appendix B). Data about physical activity is not presented in this paper. The informed consent and opening FGD remarks included a discussion of all matters related to procedural ethics including the privacy of data. Participants signed the Informed Consent Forms and entered personal demographic data, including name, age, city of residence, parish of residence, number of children in household under 18 years old, gender, racial or ethnic group(s), SNAP benefit participation, occupation, and education level into Qualtrics XM Software (Qualtrics software, Version-March 2019, Provo, UT, U.S.A., 2019) which was loaded onto 4 tablet devices (Apple iPad mini®). A digital recorder was used to record the FGD which lasted 75 min. After the FGD, field notes were written and digital pictures of the venue were taken. Before the analysis, the recorded data was transcribed into text and the accuracy of the recordings and the verbatim text were verified.

Initially, the data for the three parishes were coded (Dedoose 8.3.35, SocioCultural Research Consultants, LLC, Los Angeles, CA, U.S.A., 2020) using in vivo, emotion, and values codes.\textsuperscript{173} In vivo coding uses the participants’ own words for the codes. In this case, in vivo coding provided observations on the language of the participants. Then, emotion codes were applied to capture the feelings associated with the discussion. Last, the data were coded according to the constructs of the TPB and the values of the participants. After this, pattern coding, a form of axial coding, was used to group the initial codes into concepts and condense
the categories. Pattern coding was manually applied to arrange the codes into 10 categories based on the TPB including one category about behaviors, attitudes, and values related to grocery shopping. Fourteen themes about healthy eating emerged from the pattern coding and were categorized into four constructs of the TPB.

High standards of qualitative research were maintained by implementing Tracy’s criteria. Developing FGD questions based on TPB and obtaining peer-review ensured a high level of study rigor. Three FGD in rural LA were conducted and data were collected to a point of theoretical saturation which was evident when no new information emerged. The data were triangulated through field notes and multiple FGD followed by the separate analysis of each FGD and cross-analysis to identify themes. The three initial FGD coding results from the in vivo, emotion, and TPB with values coding and one final coding with pattern coding were confirmed for all documents, including the transcript, field notes, and FGD notes to ensure the credibility of the results.

3.3 Results

Focus group discussions were conducted from March–April of 2019 in Winn Parish (N = 16), Concordia Parish (N = 7), and Washington Parish (N = 6). The participants were primarily single Black females of age 18–30 years who earned a high school diploma, were employed, and had children living in the home (Table 3.1). Most participants (86%) resided in SNAP-Ed eligible census tracts, and 39% of the participants reported receiving SNAP benefits. Most people (N = 26) reported that they had responsibilities for shopping and/or preparing food. Five of the six participants in Washington Parish were students preparing for the General Educational Development exam. Thirteen percent of the participants were residents of a halfway house which supported the development of life skills including grocery shopping and cooking. These
two sub-groups exist routinely in the LA SNAP-Ed population. The following sections describe the emerging themes related to attitudes, subjective norms, perceived behavioral control beliefs, and intentions about healthy eating of the low-income, rural population of LA.

Table 3.1. Demographic information for FGD participants in three rural low-income Louisiana parishes, n = 28a

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>86</td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td><strong>Ethnicity/Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>White</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>High school or GED</td>
<td>14</td>
<td>50</td>
</tr>
<tr>
<td>Some college</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>College degree</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Unmarried couple</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Single</td>
<td>16</td>
<td>57</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>16</td>
<td>57</td>
</tr>
<tr>
<td>31-40</td>
<td>2</td>
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<td>41-50</td>
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<td>11</td>
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<td>51-60</td>
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<td>14</td>
</tr>
<tr>
<td>61-67</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td><strong>Do you receive SNAP benefits?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>61</td>
</tr>
<tr>
<td><strong>Number of children &lt; age 18</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Table cont’d.
3.3.1 Attitudes

The participants defined the term “healthy eating” as consuming specific foods, such as fruit, vegetables, lean proteins, whole grains, nuts, and foods prepared with less fat or salt in designated portion sizes. Washington Parish participants voiced questions about what foods were healthy in addition to fruit and vegetables. Healthy eating was described as having negative financial impacts when the price was considered high or when perishable foods were not consumed. One participant said, “I think when I try to do healthy stuff, I am about to spend a lot of money and I am fixing to have to go back before the end of the week because if it doesn’t get eaten, it is going to go bad.” Healthy food was depicted as less palatable relative to EDNP foods. One participant said, “I like to eat good. Like good food, right? I eat a salad here and there.” However, healthy food was explained as having both short-term benefits (i.e., “not tired all the time,” “better shape,” “feel better”) and long-term benefits (i.e., “live longer” and “positive effect on children’s health”). Most participants reported satisfactory access to healthy foods stocked in local shopping venues. However, a few participants who resided in the most rural areas described traveling one hour every week to buy groceries which limited purchases of fresh produce.

3.3.2 Subjective norms

Professional sources of nutrition information included local physicians and nutrition educators with SNAP-Ed. Participants said that the doctors, “always give you a sheet and a guide.” As professional resources for nutrition information were limited, some participants relied on internet sources, family members, and prior knowledge gained in school health classes.
When discussing the internet, one participant asked, “How in the world do you know if it’s a good site?” Another stated, “Yeah, people can put anything on the internet.” Referring to prior health classes, another participant said, “The Food Guide Pyramid is what sticks in my mind. Your protein, your eggs, and what not.” One participant said his family was a good source of nutrition information and included a grandmother who had “a great big garden. That’s how I know about vegetables. I would have to move to a big farm to have all that.” An older brother was a “freak with being healthy.” One participant obtained nutrition information from her father who was a marathon runner and weightlifter. In general, the participants conveyed that friends and family were positive, negative, and neutral influences on healthy eating. Regarding family, one participant said, “Mine would be happier (if I ate more fruits and vegetables) because my kids are worried about my health.” In Winn Parish, participants reported that the parents and grandparents limited the intake of sweets for the young children, while the adult children encouraged the grandparents to eat healthy. The preferences of family members or others at shared meals influenced the healthiness of the food served. One participant said a barrier to healthy eating was, “somebody or a family member telling you that they don’t want that (healthy food). So, you have to take another route and find something else to cook in place of that.” Some participants said that family members would refuse to eat fruits and vegetables because they did not like them. Other participants conveyed that if they improved their eating behaviors, some members of the family would not notice. The participants in Washington Parish described that friends were a negative influence on healthy eating. When asked what their friends would say if they chose to eat more fruits and vegetables, the participants mimicked their friends’ response, “What is wrong with you?” or “He (boyfriend) would be like ‘Who you trying to get skinny for?'” One participant stated, “A lot of people don’t eat healthy. They like to go to Taco
Bell, love to go to Burger King, go eat at that fast-food restaurant and spend their money, McDonalds.”

3.3.3 Perceived behavioral control

The price of healthy food was the most frequently mentioned barrier in Winn Parish and Concordia Parish. Additionally, the high palatability and availability of EDNP foods, particularly when leaving the workplace hungry, was a barrier to healthy food consumption. One participant said, “Yeah, you want to eat right then and there.” Washington Parish participants articulated impulsive urges to purchase unhealthy foods in the grocery store. One participant said, “I love chips, so the salad is going to have to wait.” In many instances, participants reported that healthy food does not meet taste expectations. One participant said, “Greens are vegetables, but the meat that we season our greens with is not the best kind of meat for us. But, if we could find a way to make it still taste as good as we want it to taste, I think everybody would eat more vegetables that way.” Participants also talked about the lack of motivation to sustain healthy behaviors, saying, “I could eat healthier. But I still have to have my chocolate,” and “I can eat healthy, but I don’t know how long I would keep it up.”

3.3.4 Intentions

Participants described mixed intentions related to healthy eating. When asked about planning to eat healthy foods, one participant stated, “Well, I have a plan. I just have to follow through with it. I made plans my whole life, but they don’t always work out.” One participant said, “Maybe you could have one cheat day out of the week.” Participants voiced the importance of planning to purchase healthy foods that would also satisfy taste preferences. Another participant said, “You need to do something like a challenge. You know like on Facebook (for support).” Some participants thought it was important to prepare several meals
ahead of time, learn healthy food preparation methods, eat breakfast, keep healthy foods and snacks available, make gradual changes, and buy new cooking equipment (e.g., an air fryer or a dehydrator). Others thought that it was important to stop engaging in certain practices, such as frying foods, drinking sugar-sweetened beverages, and buying or preparing unhealthy foods.

3.3.5 Cross-case analysis

A cross-case analysis of themes classified by attitudes, subjective norms, perceived behavioral control beliefs, and intentions aided in the development of final themes through comparison and contrast of findings in each parish. The themes were consistent across parishes. However, one group of participants did not mention the long-term benefits of healthy eating or high prices of healthy foods as a barrier (Table 3.2).

3.4 Discussion

The findings of this study provide insight into the attitudes, subjective norms, perceived behavioral control beliefs, and intentions of rural, low-income LA residents regarding healthy eating behaviors. One pervasive attitude was that healthy eating has negative financial impacts primarily due to the price of substituting healthier foods for unhealthy foods. Price has previously been identified as a major barrier to healthy eating in the U.S.\textsuperscript{130,145,148-150} and outside of the U.S.\textsuperscript{153-157} In this study, participants shopped at discount stores or outside of their local community (i.e., outshopping) to obtain better prices and quality foods. Healthy foods were perceived as less palatable relative to EDNP foods, and serving healthy foods sometimes resulted in uneaten foods and subsequent financial losses due to waste. Concordia Parish and Winn Parish participants described healthy eating consistently with the DGA including the type of food, preparation methods, and food portion controls similarly to previous findings in U.S. rural populations.\textsuperscript{130,145,146} Every FGD identified the short-term advantages of healthy eating as
physiologically beneficial. Participants in Concordia Parish and Winn Parish also identified long-term benefits of healthy eating as noted in other studies.\textsuperscript{130,152,176}

Table 3.2. Cross-case analysis of qualitative themes related to healthy eating in three rural, low-income Louisiana parishes.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Washington</th>
<th>Concordia</th>
<th>Winn</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTITUDES about healthy eating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative financial impacts</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Defined as control of foods and portions</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Less palatable relative to EDNP foods</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Short-term physical benefits</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Long-term physical benefits</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>SUBJECTIVE NORMS for nutrition information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited professional resources led to reliance on other sources of nutrition information.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SUBJECTIVE NORMS of family/friends</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends and family may be positive, negative, and/or neutral influences on healthy eating.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PERCEIVED BEHAVIORAL CONTROL – barriers to buying and eating healthy foods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High price of healthy food</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High palatability of EDNP foods</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High availability of EDNP foods</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low palatability of healthy food</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low motivation to sustain behavior change</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>INTENTIONS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support enhances eating intentions.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Planning enhances healthy eating intentions.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

These emergent findings are consistent with other studies about healthy eating in the rural low-income populations of Louisiana\textsuperscript{148} and Mississippi.\textsuperscript{130,145,152} Higher rates of chronic health conditions exist in the deep south compared to other regions of the U.S.,\textsuperscript{78} and unique attitudes, beliefs, and barriers to healthy eating may be contributing factors.
Two themes were identified related to the influences of subjective norms on eating. First, limited availability of health care professionals and nutrition educators led to reliance on other information sources, such as the internet (if available), friends, and family. Second, family and friends were described as positive, negative, and neutral influences on healthy eating. Participants in Winn Parish discussed a mutually beneficial interaction between the adults and the children, where the parents and grandparents limited intake of sweets for the younger children, and the adult children encouraged healthy eating in the older adults. However, family members were a negative influence when they refused to eat healthy foods. In Washington Parish, friends were a negative influence on healthy eating during socialization with peers while eating fast-food. Additionally, participants described teasing from peers when they attempted to eat healthfully.

Perceived behavioral control beliefs included the availability of low cost, EDNP fast foods, high prices of healthy foods, lower palatability of healthy foods compared to EDNP foods, and low motivation to sustain healthy eating behaviors. The high price of healthy foods¹³⁰,¹⁴⁵,¹⁴⁸-¹⁵⁰ and the availability of EDNP foods¹⁴⁶,¹⁴⁹,¹⁵⁰,¹⁵² have been previously identified as barriers to improving eating behaviors in the southeast U.S. Participants expressed interest in eating highly palatable EDNP foods which they termed as “bad” foods. Consumption of EDNP foods frequently occurred in conjunction with leaving work for the day and was similar to previous findings in the rural, low-income population where the need for convenience and instant gratification were cited.¹⁴⁶,¹⁴⁹,¹⁵⁰,¹⁵² Food purchases and meal preparation were influenced by the food preparer’s energy level, hunger intensity, the anticipated length of time to prepare a home-cooked meal, family schedules, and/or emotional drivers for eating. Eating fast-food was an
easy choice when compared to the alternative of preparing a healthy meal at home which was not perceived to be convenient or preferable in taste for everyone.

The intentions to eat healthy foods ranged from highly motivated to begin new behaviors to not motivated or overwhelmed. Winn Parish participants wanted to learn to prepare meals ahead or begin “meal prepping” for several days in advance. Participants who intended to improve their eating suggested facilitators such as social support and planning ahead would enhance the likelihood of engaging in new healthy behaviors.

3.4.1 Study limitations

Limitations of this research include using the purposive sampling method which may have led to selection bias and nonrepresentation of the population; however, 86% of participants resided in rural SNAP-Ed eligible census tracts. Participants were primarily single women between 18–30 years old. Due to the demographics of the sample, this study may not reflect the needs of males, residents outside of rural areas in the southeast U.S., and populations under different socioeconomic conditions.

3.4.2 Implications for research and practice

The study participants described control beliefs about eating healthy foods including time constraints, restricted budgets, taste expectations, and limited support to increase and sustain motivation for new behaviors. Due to limited availability of professional nutrition education resources in rural parishes, participants relied on friends, family, and the internet (if available) for healthy eating information. Two themes, social support and planning, enhanced the likelihood of acting on healthy eating intentions. Prior recommendations from a recent social marketing campaign evaluation in LA included improving the campaign’s reach in the young adult population via social media. Currently, plans for broadband connectivity improvements in
rural LA provide the opportunity to increase support for healthy eating behaviors and nutrition education (including meal planning) in future social marketing campaigns. Formative research is needed to identify and prioritize new social marketing distribution channels (i.e., text messaging, internet, and social media) in combination with current distribution channels (e.g., print and broadcast media) and to mutually determine the targeted foods, beverages, and behaviors to address. Since participants reported the barriers of time constraints, price, and taste concerns of healthy foods, it will be important to identify the specific barriers to each targeted food and address the obstacles in relevant persuasive messages. Similar to residents of remote environments outside of the U.S., some LA residents report hunting and fishing to reduce food expenses. Other solutions using local natural resources may be identified to reduce barriers to healthy eating.

Two targets for persuasive messages and community education are the “good food–bad foods” and the “cheat day” approaches to dieting. These tactics may lead to increased hunger and feelings of deprivation due to the omission of preferred foods and may trigger subsequent over-eating. Reinforcing the Academy of Nutrition and Dietetics position on the total diet approach, which includes maintaining a healthy diet pattern as a lifestyle change, may improve long-term eating habits. Education about consuming meals that are inclusive of all foods, eating in moderation, trying new foods, and following healthy portion sizes is continually needed. Additional supportive interventions (e.g., social media challenges, group cooking and educational opportunities, and healthy recipes that meet taste expectations) may enhance future campaign participation by LA rural populations.

Another target for persuasive messages is the frequent purchase of fast foods at dinner meals. Bacon found that lower-income and single parents preferred a health frame more often
than a family togetherness frame for acknowledging the importance of family meals.\textsuperscript{163}

Persuasive messages which emphasize the long-term benefits of home-cooked meals, (i.e., health of the family and lower cost of meals) may be beneficial. More nutrition education and support for healthy shopping (e.g., grocery shopping phone applications) and food preparation (e.g., how to plan, shop, prepare, and safely store multiple meals) geared to single parent families may increase healthy eating in LA. Consumption of EDNP foods at meals is not unique to the U.S. Residents of rural and remote environments in Canada, Uganda, Australia, and the Pacific Islands countries reported that EDNP foods are more available due to increased trade. Consequently, EDNP foods are considered a barrier to the consumption of healthy traditional foods in their respective cultures.\textsuperscript{153-157} Healthy eating promotions in these remote locations encourage the intake of traditional healthy foods shared with family and friends for the prevention of obesity and chronic disease.\textsuperscript{156}

Food choices may be influenced by both peer and parental beliefs while adolescents complete their high school education. This was seen in Washington Parish where most of the participants were 18–19 years of age and half reported their mothers prepared some meals for them. Participants in Washington Parish asked the most questions about which foods were nutritious. These adolescents described more impulsive behaviors and less behavioral control while shopping than participants in other FGD. Since behavioral control beliefs have a strong correlation with intention,\textsuperscript{162} persuasive messages to target impulsivity in stores may be beneficial. The adolescent participants believed that their peers were eating in fast food restaurants frequently; however, adolescents may misperceive the behavior of their peers. Social marketing messages designed to simultaneously clarify or change the social norms of peers and support healthy parental norms may be effective.\textsuperscript{161} Additional formative research and
segmentation of future social marketing campaigns may be necessary to provide tailored nutrition education and to achieve optimal message resonance with older adolescents.

3.5 Conclusions

In conclusion, this research demonstrated that the TPB was an effective theory from which to elicit healthy eating attitudes, beliefs, and barriers of low-income rural residents, including SNAP-Ed participants in LA. Eating attitudes, beliefs, and barriers of the target audience included budgetary concerns, highly available and palatable EDNP foods, the low palatability of healthy foods, and decreased motivation to sustain healthy eating behaviors. Formative research to clarify optimal distribution channels may improve the reach of future social marketing campaigns, and larger reach may increase support for changes in eating behaviors. Additionally, formative research to mutually establish healthy food and beverage targets for intervention and to investigate the control beliefs associated with the targets is essential for the development of persuasive messages. Future social marketing campaigns may benefit from additional research and segmentation of the population to tailor social marketing messages, nutrition education, and interventions to older adolescents. Research findings from this study will be used to inform the development of future SNAP-Ed social marketing campaigns to promote healthy eating behaviors by rural low-income residents in LA.
4.1 Introduction and background

Residents of the southeastern U.S. are at higher risk for diet-related chronic diseases including obesity, diabetes, heart disease, and cancer with high prevalence rates in Louisiana (LA) and neighboring states of Alabama, Mississippi, and Arkansas.\textsuperscript{38,178-180} People with limited resources may not consume adequate amounts of fruit and vegetables which are protective against obesity and chronic disease.\textsuperscript{2-5,30,90} In LA, some residents report not consuming vegetables (25\%), but the majority of residents report consuming vegetables at least once per day.\textsuperscript{6} Improvements in vegetable intake to recommended levels (two and one-half servings per day for adults) may reduce the risk of chronic disease in LA.\textsuperscript{90}

The Supplemental Nutrition Assistance Program – Education (SNAP-Ed) develops social marketing campaigns in addition to providing nutrition education and community initiatives to foster healthy eating behaviors and physical activity PA in clients on a thrifty budget.\textsuperscript{1} In 2014 and 2017, nutrition educators at the Louisiana Cooperative Extension Service initiated social marketing campaigns to promote healthy eating behaviors and increased PA in the state. A program evaluation of the campaigns included recommendations to establish an online format to reach younger audience, increase the diversity of people depicted in print materials and recipes, expand languages used in print and advertisements, and enhance variety in the format of recipes and print media.\textsuperscript{9} Based on these recommendations and findings from recent formative research, new social marketing campaigns are planned to promote healthy eating and PA in LA. Also, barriers to healthy eating, audience segmentation strategies, and potential food behaviors have been identified for low-income rural LA residents.\textsuperscript{71} However, additional research is needed to
determine if persuasive messages tailored to regional preferences and other factors (e.g., vegetable consumption patterns) are needed to achieve resonance with the low-income population in LA.\textsuperscript{13}

Conjoint analysis (CA) is a marketing technique that is based on random utility theory which suggests that preferences (utilities) are a function of observed and unobserved characteristics (attribute levels) of a product.\textsuperscript{181} When making a choice, consumers select the product which has most or all of their preferred components, i.e., the highest utility, while considering price. Traditional CA surveys simulate viable product models or concepts and obtain a consumer rating for each one. In CA, the ratings measure the combined effect of two or more attribute levels on the consumers’ preference for the product.\textsuperscript{21,182} Once obtained, the product ratings are fit in a multiple regression model to deconstruct the joint ratings into the values of each product component.\textsuperscript{21} Estimated parameters of regression analysis are the utilities or preferences for each attribute level and are used to design the final product. Conjoint analysis has informed the design of many products and services and has recently been applied to research in food science, nutrition, and health.\textsuperscript{23,26,45,183-185}

Social marketing campaigns which include grocery and community interventions based on Behavioral Economics (BE) demonstrate increased consumption of 1% milk,\textsuperscript{111,117,119,124} fruit,\textsuperscript{111,121,135} and vegetables\textsuperscript{111,117,121,135} in the low-income population. By altering the grocery environment where food selection occurs, and thus interrupting automatic behaviors and habits, BE interventions make selecting the healthy food choice easier for consumers.\textsuperscript{186} For example, product placement strategies to improve salience, such as placing healthy foods in prominent store locations, shows improved sales and intake of nutritious foods in low-income retail environments.\textsuperscript{46,49,187,188} The most influential BE interventions: \textit{messenger, incentive, norms,}
defaults, salience, priming, affect, commitment, and ego are detailed in the MINDSPACE framework.20

The use of BE strategies in social marketing message design is novel, and limited research is available. However, social marketing campaign messages which include social norms, messengers, and commitments demonstrate increased participation in health screenings for cancer and diabetes eye health,51-53 reduced calorie intake,54 and increased purchases of fresh produce in an urban low-income environment.55 This research aims to identify the preferences of low-income LA residents for BE strategies, specifically messengers, social norms, and commitments in future social marketing campaigns to improve vegetable intake.

4.2 Rationale for research variables

4.2.1 Messenger attribute and levels

The message source or messenger conveys authority about the content of the message and inspires conformity with the intent of message. Della (2016) modeled preferences for social marketing messages to promote fruit and vegetable intake in the African American population and reported that the preferred messenger varied by rural or urban geography.26 In Della’s study, the most significant part of the message design was the messenger, and the most preferred messenger was the healthiest best friend followed by the mother/grandmother.26 Other research shows that a peer or friend can be an effective messenger in the low-income population,106 especially when communicating familiar information.189 However, professionals are more favored to address health behaviors,71,186,189 which may be important in LA where access to health care providers is limited.180 Weight bias may be an additional consideration for health professionals who disseminate nutrition information; yet, findings about the impact of weight stigma are mixed.190-192 Lastly, rural SNAP-Ed participants in LA describe contradictory
influences of family members on food selection. However, children living in low-income environments have been successful advocates for healthy eating. The aforementioned messengers comprise a diverse set of trusted, influential message sources likely encountered by the LA low-income population; thus, a child, friend, mother, normal weight physician, and overweight physician were selected as independent variables for the CA study.

4.2.2 Message attribute and levels

Social norms influence food intake through modelling of eating behavior, and thus, social norms may impact the consumption of healthy foods and suitable portions. For example, descriptive norms, or norms which explain the specific healthy eating behavior of a group, resulted in improved intake of vegetables. Liking norms, or norms which suggest individuals enjoy eating vegetables, demonstrated positive effects on vegetable intake in low consumers of vegetables. Injunctive norms describe how and what people should eat. Although injunctive norms showed little influence on improving food intake in the past, recent information shows injunctive norms may be effective in health contexts. Recent formative research shows friends and family are positive and negative influences on eating habits in rural LA residents.

Finally, a pre-commitment strategy is an advance commitment made in preparation for a future occasion where it will be beneficial to limit one’s choices. For example, shopping with a grocery list aims to increase the likelihood that only relevant healthy foods are purchased because the consumer makes a commitment to only buy food which is on the list. Using a shopping list is favorable to health since it is associated with lower body mass index (BMI) and higher diet quality. Pre-ordering a healthy meal is also physically beneficial as demonstrated by children who pre-ordered lunch in the morning and subsequently increased healthy food
choices at the school lunch meal. The pre-commitment variables (grocery list before shopping and vegetable selection from menu before dining out) may increase the likelihood of success in efforts to eat healthy. If the commitment is not honored, the person who made the commitment may regret the negative consequences of not having a grocery list or not choosing a vegetable from the menu before the meal. Thus, the person may follow through on the commitment to avoid future remorse. The social norms and pre-commitment strategies were selected as independent variables because they demonstrate efficacy in promoting healthy food selection and consumption, and they may be relevant BE strategies in social marketing campaigns which promote healthy eating in LA.

4.2.3 Dependent variable

The dependent variable was the likelihood of adding vegetables to the meals. Since the intent of social marketing campaigns is to change behavior, adding vegetables was selected as a feasible behavior change for participants at all levels of vegetable intake.

4.2.4 Research questions

This research aimed to identify the preferences of low-income LA residents for BE strategies, specifically messengers, social norms, and commitments in future social marketing campaigns to improve vegetable intake. A secondary aim was to determine if there were regional or other demographic factors which were associated with message and messenger preferences. The research questions were:

1. What are the preferences of the LA low-income population for BE strategies including messengers, social norms, and commitments in social marketing messages designed to increase the amount of vegetables served at meals?
2. Are there regional or other differences for preferences regarding messengers, social
norms, and commitments in social marketing messages designed to increase the amount
of vegetables served at meals in the LA low-income population? If so, describe those
differences.

4.3 Methods

4.3.1 Participants

All policies and procedures for this study were approved by the Louisiana State
University Institutional Review Board (IRBAG-20-0034) (Appendix C). The CA survey was
developed and administered online via Qualtrics Software (Qualtrics software, Version-March
2019, Provo, UT, 2021). Nutrition educators from SNAP-Ed and Extension agents assisted with
obtaining a purposeful sample by promoting the survey link to SNAP-Ed participants, and many
agencies including Louisiana Healthcare Connections provided the survey link to their clients.
Community libraries and newspapers promoted the survey online and in local libraries. When
the participant accessed the survey webpage, matters related to confidentiality and consent were
described, and the participant provided consent and began the survey. If the participant did not
give consent, the survey was immediately closed. After completing the survey, the participant
had the option to proceed to a separate online survey to participate in a gift card raffle.
Participants were included if they were 18 years of age or older and if they resided in a Louisiana
parish. Participants were asked if their family received benefits such as SNAP, Supplemental
Assistance Program for Women, Infants, and Children (WIC), Temporary Aid for Needy
Families (TANF), Medicaid, or if their income met SNAP eligibility requirements.
4.3.2 Conjoint survey

A full profile traditional CA survey with single concept ratings was created with two attributes (messenger and message) and five levels for each attribute (Table 4.1).

Table 4.1. Independent variables for conjoint analysis- attributes and levels

<table>
<thead>
<tr>
<th>Attribute: Messenger</th>
<th>Messenger Levels:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child</td>
<td></td>
</tr>
<tr>
<td>Friend</td>
<td></td>
</tr>
<tr>
<td>Normal Weight Doctor</td>
<td></td>
</tr>
<tr>
<td>Overweight Doctor</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Attribute: Message</th>
<th>Message Levels:</th>
<th>Message:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precommitment: Vegetable Selection</td>
<td>Before eating out, pick a meal with vegetables from the menu and stick to it.</td>
<td></td>
</tr>
<tr>
<td>Precommitment: Grocery List</td>
<td>Before you go shopping, make a grocery list and stick to it.</td>
<td></td>
</tr>
<tr>
<td>Liking Norm</td>
<td>Most people enjoy eating vegetables every day.</td>
<td></td>
</tr>
<tr>
<td>Descriptive Norm</td>
<td>Most people eat at least one vegetable every day.</td>
<td></td>
</tr>
<tr>
<td>Injunctive Norm</td>
<td>We should eat 2 ½ cups of vegetables every day.</td>
<td></td>
</tr>
</tbody>
</table>

For the messenger attribute, the levels were child, friend, normal weight doctor, overweight doctor, and mother. For the message attribute, the levels were an injunctive norm, a descriptive norm, a liking norm, a grocery list pre-commitment, and a vegetable selection pre-commitment. The CA survey was peer-reviewed by LSU Food and Nutrition staff and SNAP-Ed Nutrition Educators for clarity and content. Respondents rated twenty-five randomized concepts presented as posters of each messenger with each message (Figure 4.1) and completed demographic information which included a question about the frequency of vegetable intake. The participants rated how likely they were to add vegetables to their meals for each concept using a scale. A score of “1” was less likely, and a score of “9” was more likely to add vegetables to meals (Figure 4.2).
We should eat 2 ½ cups of vegetables every day.

Most people enjoy eating vegetables every day.

Most people eat at least one vegetable every day.

Before eating out, pick a meal with vegetables from the menu and stick to it.

Before you go shopping, make a grocery list and stick to it.

Figure 4.1 Example of concepts in a poster with 1) an injunctive norm and the normal weight physician, 2) a liking norm and overweight physician, 3) a descriptive norm and mother, 4) a vegetable selection pre-commitment and child, and 5) a grocery list pre-commitment and friend(s).
Before eating out, pick a meal with vegetables from the menu and stick to it.

After reading this nutrition message from Taylor, a child, how LIKELY are you to ADD VEGETABLES to your meals? A score of “1” is NOT likely, and a score of “9” is VERY likely.

Click and slide the dot to make your selection.

Figure 4.2. Sample question for conjoint analysis

4.3.3 Statistical analysis

A model of the ratings data was generated using a Mixed Method-Repeated Measures procedure with an unstructured covariance matrix in SAS Studio (SAS software, Version 3.8 (Enterprise Edition). Copyright © 2012-2018. SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, U.S.A.) Degrees of freedom were estimated using the Kenward Rogers method. Inferential and descriptive statistics were calculated in SAS Studio. Attribute importances were calculated by dividing the range of each attribute by the total range of both attributes and multiplying by 100. Covariates (age, gender, location, geographical status, vegetable intake frequency, number of adults residing in the home, education, number of children residing in the
home, and race) were modeled with the message and messenger variables (ratings data) using Mixed Methods - Repeated Measures multiple regression in SAS. SNAP-eligible participants were segmented from non-SNAP-eligible participants to model the location covariate.

4.4 Results

4.4.1 Participants

The CA survey was active on Qualtrics between October 15, 2020 and March 30, 2021. Participants (N = 398) accessed the online survey in Qualtrics after recruitment from rural and urban parishes in LA. Forty-two participants did not give consent to participate, some participants (n = 18) did not respond to the survey questions, and others did not complete the survey (n = 47). Some participants had no variation to their responses (n = 52), answered less than thirteen questions (n = 25), or were under 18 years of age (n = 1) and were eliminated from analysis. Final participants were primarily SNAP-eligible (84 %), employed full-time (44 %), white (53 %), females (91 %) aged 31-40 years with two or more adults (61%) and two or fewer children in the home (74%). Most participants had completed some college credit (26 %) or had a high school education (25 %). Many participants resided in nonmetropolitan areas (59 %) of South LA (60 %) and reported consuming vegetables one time per day (58 %) (Table 4.2).

4.4.2 Results

4.4.2.1 Statistical model

The independent variables for the full statistical model were the messages, messengers, and the interaction between the messages and the messengers. The dependent variable was the ratings data from the CA survey for the likelihood of adding vegetables to the meals. The full model using Mixed Methods-Repeated Measures and an unstructured covariance matrix was the best fit for the data ($\chi^2_{324} = 5487$, $P < .0001$). The messenger and message interaction was not a
<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
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<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>159</td>
<td>91</td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td><strong>Ethnicity/Race</strong></td>
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<td></td>
</tr>
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</tr>
<tr>
<td>Black</td>
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<td>41</td>
</tr>
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<td>3</td>
</tr>
<tr>
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<td>2</td>
</tr>
<tr>
<td>Native Hawaiian</td>
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<td>1</td>
</tr>
<tr>
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<tr>
<td>Less than high school</td>
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<td>1</td>
</tr>
<tr>
<td>Some high school</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>High school or GED</td>
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<td>25</td>
</tr>
<tr>
<td>Some college</td>
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<td>26</td>
</tr>
<tr>
<td>Trade school or vocational training</td>
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<td><strong>Vegetable Intake Frequency</strong></td>
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</tr>
<tr>
<td>0 times per day</td>
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</tr>
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<td>1 time per day</td>
<td>101</td>
<td>58</td>
</tr>
<tr>
<td>2 or more times per day</td>
<td>55</td>
<td>32</td>
</tr>
<tr>
<td><strong>SNAP or SNAP eligible</strong></td>
<td></td>
<td></td>
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<tr>
<td>Not SNAP eligible</td>
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<tr>
<td>South</td>
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<tr>
<td><strong>Number of children in the home</strong></td>
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<tr>
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<tr>
<td>2</td>
<td>45</td>
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</tr>
<tr>
<td>3</td>
<td>26</td>
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</tr>
<tr>
<td>6</td>
<td>2</td>
<td>1</td>
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<tr>
<td><strong>Number of adults in the home including participant</strong></td>
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<td></td>
</tr>
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<td>1</td>
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<td><strong>Employment</strong></td>
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<td>Seasonal</td>
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<td>1</td>
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<tr>
<td><strong>RUCC Classifications</strong>&lt;sup&gt;39&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1- Counties in metro areas of 1 million population or more</td>
<td>8</td>
<td>4</td>
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significant predictor of adding vegetables to meals, and it was removed from the final model.

Unstandardized parameter estimates, also known as conjoint utilities, were obtained for the overall model using SAS Studio (Table 4.3).
Table 4.3. Parameter estimates (unstandardized) from the full model (N = 213)

| Parameter         | Parameter Estimate | Standard Error | t Value | Pr > |t| |
|-------------------|--------------------|----------------|---------|------|------|
| Intercept         | 6.8365             | 0.1360         | 50.26   | < .0001* |
| Messengers        |                    |                |         |      |      |
| Mother A          | 0                  |                |         |      |      |
| Doctor (normal weight) | -0.02425 | 0.07074         | -0.34   | .73  |      |
| Doctor (overweight)    | -0.07579 | 0.07509         | -1.01   | .31  |      |
| Child              | -0.2023            | 0.07815        | -2.59   | .0104* |      |
| Friend             | -0.2360            | 0.08167        | -2.89   | .0043* |      |
| Messages           |                    |                |         |      |      |
| Pre-commitment grocery list | 0.1858 | 0.07512         | 2.47    | .0142** |      |
| Injunctive norm    | 0.1776             | 0.06526        | 2.72    | .0071** |      |
| Pre-commitment vegetable selection | 0.06098 | 0.05827         | 1.05    | .30  |      |
| Liking norm A      | 0                  |                |         |      |      |
| Descriptive norm   | -0.00691           | 0.04939        | -0.14   | .8889 |      |

4.4.2.2 Messengers and message preferences of the LA low-income population (research question 1)

There was significant variation in the main effect of the messenger $F(4, 200) = 2.90$, $P = .0229$ in the full model. Pairwise comparisons with a Tukey adjustment demonstrated a difference in preference ratings for friend and mother ($P = .0343$) and the normal weight doctor and friend ($P = .0440$). The mother and normal weight doctor were the most preferred messengers in the low-income population of LA based on the predicted mean utility ratings of the included messengers. The ratings for the messenger variable ranged from 6.80 – 7.06 on a ratings scale of 1-9. The predicted means of the messenger utilities are shown in Figure 4.3. There was also significant variation in the main effect of the message $F(4, 199) = 3.57$, $P = .0078$. Pairwise comparisons using Tukey adjustments showed a difference in preference ratings for the grocery list precommitment and the descriptive norm ($P =.0484$) and the descriptive norm and injunctive norm ($P = .0351$) (Figure 4.4). The ratings for the message variable ranged from
### Messenger Variables: Predicted Means of Ratings (N = 213)

- **Mother**: 7.06<sup>A</sup>
- **Normal weight doctor**: 7.03<sup>B</sup>
- **Overweight doctor**: 6.95
- **Child**: 6.84<sup>AB</sup>
- **Friend**: 6.80<sup>AB</sup>

\[ A \ p = .0343, \ B \ p = .0440, \ \text{pairwise Tukey adjustment} \]

Figure 4.3. Predicted means of messenger ratings

### Message Variables: Predicted Means of Ratings (N = 213)

- **Grocery list**: 7.02<sup>A</sup>
- **Injunctive norm**: 6.98<sup>B</sup>
- **Vegetable selection**: 6.83
- **Descriptive norm**: 6.79<sup>AB</sup>
- **Liking norm**: 6.78

\[ A \ p = .0484, \ B \ p = .0351, \ \text{pairwise Tukey adjustment} \]

Figure 4.4. Predicted means of message ratings
6.78 – 7.02 on a ratings scale of 1-9. Based on the predicted means, the grocery list precommitment and the injunctive norm were the most favored messages. The attribute importance calculated from the overall model was 45% for the message attribute and 55% for the messenger attribute. Attribute importance is a measure of how relevant each attribute is to the preference ratings.

4.4.2.3 Regional differences for messenger and message preferences (research question 2)

The ratings data of SNAP-eligible participants was segmented into north and south regions. Vernon Parish, Rapides Parish, Avoyelles Parish, and all parishes south of these were considered South LA. North LA included Concordia Parish, Grant Parish, Sabine Parish and all parishes north of these. A Mixed Methods – Repeated Measures procedure was used to develop two models for the ratings by location. The independent variables in the first model were message, location, and the interaction between message and location. The independent variables in the second model were messenger, location, and the interaction between messenger and location. The interaction results were calculated based on 4 degrees of freedom. The dependent variable for both models was the likelihood of adding vegetables to the meals determined by the ratings on the conjoint survey. Although the location and messenger interaction approached statistical significance (P = .0536), neither interaction (location and messenger or location and message) was significant. Therefore, paired comparisons with post hoc testing were not reported. Predicted means for SNAP-eligible participants in north and south LA were calculated and shown in Figure 4.5 and Figure 4.6. Although not a significant
interaction, the participants in south LA preferred the mother as a messenger, while the participants in north LA preferred the normal weight doctor. Messenger preferences for participants in south LA in order from most to least preferred were mother, normal weight doctor, child, overweight doctor, and friend. Messenger preferences for participants in north LA in order from most to least preferred were normal weight doctor, overweight doctor, mother, child, and friend.

The interaction of the message and location covariate was not significant. While the grocery list pre-commitment message was highly preferred in south LA, the injunctive norm was most preferred in north LA. Message preferences for participants in south LA in order from most to least preferred were grocery list precommitment, injunctive norm, descriptive norm, vegetable selection precommitment, and liking norm. Message preferences for
participants in north LA in order from most to least preferred were injunctive norm, grocery list precommitment, vegetable selection precommitment, liking norm, and descriptive norm. The participants rated the messages and messengers as acceptable in both north and south LA, but generally participants in south LA had higher ratings overall than north LA.

4.4.2.4 Interaction of covariates with the message and messenger variables

There was significant variation in the message variable and frequency of vegetable intake interaction $F(8, 239) = 2.57, P = .0104$. Subsequently, a paired comparison with Tukey adjustment demonstrated significant interactions between the message and self-reported frequency of vegetable intake (Table 4.4).
Table 4.4. Interactions between message variable and vegetable intake frequency

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<th>Vegetable Frequency</th>
<th>Message</th>
<th>Vegetable Frequency</th>
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<th>Std error</th>
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¹Values are differences in least square means. ²post hoc Tukey adjusted P<.05

Given the interaction between the message and frequency of vegetable intake, a simple effects analysis ensued. As the frequency of vegetable consumption increased, the ratings or preferences for the messages significantly improved for participants at the one time/day and the two or more times/day levels of vegetable consumption except for the liking norm (Figure 4.7). Ratings for the liking norm increased only at the two or more times/day consumption level.

Figure 4.7. Message variable and frequency of vegetable intake per day

A P = .0120, B P = .0001, C P = .0006, D P = .0004, E P = .0044, F P = .0016, G P = .0238, H P = .0066, I P = .0044 (Bonferroni)
With reports of more frequent daily vegetable intake, the preference ratings for the descriptive norm message increased the most, and the preference for the precommitment to select vegetables from the menu before going to the restaurant increased the least. The predicted mean ratings for the zero-vegetable consumption group were consistently lower than the predicted means for the once/day and two or more times per day vegetable consumption groups. In participants who consumed zero vegetables/day and two or more vegetables/day, no significantly different preferences for messages were found within each vegetable intake group (Figure 4.8). However, participants who reported eating vegetables once per day significantly preferred the grocery list precommitment and the injunctive norm to the descriptive norm and the liking norm.

AP = .0048, BP = .0004 CP = .0019, DP = .0125, Bonferroni

Figure 4.8. Message variable within vegetable intake frequency groups
There were no interactions found between the messenger variable and the frequency of vegetable intake. Also, there were no significant findings for other covariate interactions with the message or messenger variables, including age group, gender, location, geographical status by RUCC classification, number of adults residing in the home, education, number of children residing in the home, and race.

4.5 Conclusions

4.5.1 Discussion

This research aimed to identify the preferences of low-income LA residents for BE strategies, specifically messengers, social norms, and commitments in future social marketing campaigns to improve vegetable intake. The full model which estimated the conjoint utilities for the messengers and the messages was a good fit for the data, and it addressed the first research question about the state-wide preferences of the LA low-income population for BE strategies. The attribute importance ratings (45% for message, 55% for messenger) showed that the participants thought both the messages and the messengers were of similar importance to the concept ratings in the CA survey. The preferences for the messenger variables from most to least were mother, normal weight doctor, overweight doctor, child, and friend. The participants significantly preferred the mother and the normal weight doctor as messengers over the friend which differs from earlier findings where the friend was more preferred than the mother as a message source.26 The mother and the normal weight doctor were not found to be significantly different in preference from the child and the overweight doctor. There also was no significant difference in preference for the physicians in the study based on the physicians’ weight status. This was similar to findings in one study where 63% of overweight women reported no preferences for a physician based on the physician’s body weight.192 The participants had
favorable preference ratings for the messengers; however, it is not known if an impact in vegetable consumption behavior would occur without data from future campaign research.

Regarding the message variable, the grocery list precommitment was rated the highest, and the injunctive norm, precommitment for vegetable selection, descriptive norm, and liking norm followed. Participants rated the preferences for the grocery list precommitment and the injunctive norm significantly higher than the descriptive norm. Injunctive norms are more likely to influence behavior than descriptive norms; however, both function to change the perceptions of acceptable behavior within the target audience. Injunctive norms may fill a gap in nutrition knowledge due to less access to direct and online nutrition information in some LA communities. Like the messenger ratings, the participants had favorable ratings for all message variables which suggests that the five message variables based in Behavioral Economics theory were acceptable to the low-income population in LA.

The interactions between messenger, message, and location (north or south LA) were not found to be significantly different. However, the messenger and location interaction approached significance (P = .0536). Based on location, some tailoring of social marketing message design may be indicated because the most preferred messenger (mother and normal weight doctor) differed between north and south LA. Though these findings were not found to be significant, the mother and the doctor are completely different message sources, i.e., a close relative vs. a professional. Similarly, the grocery list message was highly preferred in south LA, but the injunctive norm message was most preferred in north LA. The injunctive norm message taps into social belonging to influence intake, and the grocery list precommitment initially operates as a rational choice to improve intake. These variations in preference may be a consideration during the message development phase of the campaign.
Another consideration that impacts the decision to use different message designs regionally is that people in south LA had higher ratings overall than north LA. More research with participants from north LA during campaign development may be needed to assess and accommodate preferences. Since the preferences did not have any interaction with RUCC classification levels, the same messages and messengers may apply to rural and urban areas of each region.

An important finding to consider is when the frequency of vegetable consumption increased, the preferences for the messages regarding vegetable consumption increased significantly. This was most evident for the descriptive norm message which has demonstrated efficacy in promoting vegetable intake.\textsuperscript{199} Also, participants who reported eating vegetables at least one time per day significantly preferred the grocery list precommitment and the injunctive norm to the descriptive norm and the liking norm. This may indicate a preference for more robust BE messages to improve health behaviors in those consuming vegetables one time per day.\textsuperscript{204} The participants who reported eating no vegetables had favorable, but lower ratings for the messages, which may indicate that individual, social, or environmental factors may need to be addressed to improve the resonance of the social marketing campaign with those reporting no vegetable consumption in LA.\textsuperscript{205} The liking norm had the highest preference in the no vegetable consumption group which is consistent with prior research, and thus, a liking norm may make an effective introductory BE campaign message for low vegetable consumers.\textsuperscript{198} Further study with low vegetable consumers in LA is needed to develop persuasive messages about vegetable consumption.

The application of message design findings to the development of social marketing materials may improve the future campaign’s resonance with residents in low-income LA
environments. Researchers may want to develop pre-campaign materials including the most preferred messages and messengers. One approach would be to create some unique social marketing messages to accommodate preferences for both north and south LA and design other social marketing messages which could be shared by north and south LA. Researchers may benefit from conducting focus groups with members of the low-income audience to further develop and refine the materials prior to the initiation of the campaign to ensure the message is sufficiently tailored to the audience.

4.5.2 Limitations

The use of a non-probability sample may have introduced selection bias into the research. A primarily low-income female sample (91%) lessens the application of this research to males and people with higher incomes. Data about marital status which may reflect the influence of adult family members was not collected; however, the number of adults living in the home was obtained (61% with two or more adults). Missing data may have resulted in bias of the parameter estimates. It is possible that the concepts were difficult for the participants to differentiate thus complicating the ratings, but every effort was made to prevent this by providing a photo and written description of each concept for every question in the online survey.

4.5.3 Conclusions

This study adds to existing formative research about social marketing campaigns in LA by surveying the preferences of the low-income population for BE strategies including messengers, social norms, and commitments to improve vegetable intake. Modeling BE strategies for social marketing messages was effective in determining message design preferences in the low-income LA population. The present CA study demonstrated that it may
be beneficial to design future social marketing messages to improve vegetable intake based on differing levels of vegetable consumption by the target audience. Also, this research may be of interest to organizations which promote health behaviors, such as SNAP-Ed, because it demonstrated through statistical modeling that Behavioral Economics approaches are well-suited to social marketing messages aiming to promote healthy eating behaviors in low-income environments.
CHAPTER 5. SUMMARY

The purpose of the research presented in this dissertation is to inform the development of future SNAP-Ed social marketing campaigns that promote healthy eating and improved PA behaviors to low-income LA residents. The first study, a scoping literature review, produced an evidence map of research about social marketing campaigns for low-income U.S. populations, and it showed that most of the research was formative and concerned with healthy eating. Limited experimental research in adults and children showed improved intake of healthy foods (fruit, vegetables, and low-fat dairy). Also, formative and process evaluations indicated multiple campaign distribution channels may be essential to reach the low-income population, and the most readily accessible channels may vary at the local level. For instance, internet access is highly variable between rural and urban environments. Due to limited studies and mixed results of social marketing campaigns to improve engagement in PA, more research is needed to identify effective interventions to improve PA in the low-income population.

The second study was a formative evaluation that applied the Theory of Planned Behavior to identify attitudes, beliefs, and barriers to healthy eating in the rural, low-income population. Attitudes and barriers to healthy eating included concerns about the cost and low palatability of healthy foods. Because professionals to provide nutrition education were limited, participants relied on the internet (when available) and family or friends for nutrition information. Friends and family were both positive and negative influences on eating behaviors. The low cost, wide availability, and high palatability of EDNP foods were cited as barriers to healthy food intake, especially at the end of the workday. More social support and assistance with planning meals and grocery shopping may improve healthy eating behaviors by the rural low-income LA population.
The third study surveyed the preferences of the low-income population for BE strategies including messengers, social norms, and commitments in social marketing campaigns which aim to improve vegetable intake. Modeling BE strategies for social marketing messages through conjoint analysis was effective in determining message design preferences in the low-income LA population, and it demonstrated that it may be beneficial to design future social marketing messages to improve vegetable intake based on varying levels of vegetable consumption. As vegetable consumption frequency increased, the preference for the BE messages using norms and commitments increased. In this study, the preferred messengers of the low-income LA participants were the mother and the normal weight doctor which differed significantly from the friend. The preferred messages were the grocery list pre-commitment and the injunctive norm which were significantly different from the descriptive norm. Although not significant, the message and messenger preferences for participants in north and south LA differed which indicates the need for further message testing to select messages that will resonate with low-income people in LA.

The findings of this research may be of interest to SNAP-Ed and other organizations that promote healthy lifestyles to the low-income population for obesity and chronic disease prevention. In particular, the scoping literature review is unique because it identified peer-reviewed literature specifically for the low-income population in the U.S. regarding healthy eating and PA social marketing campaigns. The results of the formative study regarding the attitudes, beliefs, and barriers of rural, low-income residents in LA produced similar findings to formative research in Mississippi and Georgia. The formative results may be of interest to organizations that work to reduce disease risk in the southeast region of the U.S. Finally, the CA study demonstrated through statistical modeling that Behavioral Economics
approaches are well-suited to social marketing messages aiming to promote healthy eating behaviors in low-income environments. This research may be useful to organizations that design social marketing campaigns or BE approaches to promote healthy eating and improved PA such as SNAP-Ed, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and other agencies which serve low-resource individuals.
APPENDIX A: SUPPLEMENTAL DATA FOR CHAPTER 2

2.1 Data Extraction Template

Date_________________Reviewer

Bibliographic Reference of article:

1. Geography defined by   Circle Rural     Urban
2. Low SES defined by
3. Social Marketing Campaign name
4. Location
5. Dates of implementation
6. Study Aim:

7. Study Design
8. Theoretical Framework of Research
9. Funding Source of research study
10. Target Audience: include AGE ETHNICITY if specified
11. Purposive sample ______convenience sample ____Probability sample
    (randomized)_____sample size_______________response rate ______ How were participants
    assigned to groups?
12. Describe the control or comparison group (IF USED)
13. Outcome measures if applicable

14. Details of Social Marketing Campaign intervention

15. Duration of intervention (exposure quantity and duration)

MARKETING MIX - - NA?

16. PRODUCT  y  n

17. PLACE  y  n

18. PRICE  y  n

19. PROMOTION  y  n

ANDREASEN’S CRITERIA OF SOCIAL MARKETING - NA?

20. Behavioral Objective – focus on behavior change  y  n

21. Audience Segmentation – targeted interventions  y  n

22. Formative Research – attitudes, beliefs, culture  y  n

23. Exchange Theory – maximize the benefits, reduce the cost of change  y  n

24. Marketing Mix (product, price, place, and promotion)  y  n

25. Understand and reduce the impact of competition  y  n

26. Message Frame  y  n  Describe

27. Distribution Channels

Print media   billboard   mass media (tv, radio)

website

social media (fb, Instagram, twitter, pinterest)   text
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    administered Yes ____ No ____

12. Time Frame of data collection: baseline yes ____ no____
    subsequent collection time frame(s)

Author’s stated findings of study (Include examples) -
### 2.2 Social Marketing Components Spreadsheet for Scoping Review of Campaigns to Promote Healthy Eating and PA

<p>| Publication | Campaign Name          | product | price | promotion | behavioral objective | audience segmentation | formative research | exchange theory | marketing mix | competition | message frame | print media | billboard | tv | radio | website | social media | digital media | text | grassroots | telephone or mobile technology | bus, subway | school environment | home environment | shopping environment | community environment | Professional Marketing |
|-------------|------------------------|---------|-------|-----------|----------------------|-----------------------|--------------------|-----------------|---------------|-------------|---------------|-------------|-----------|---------|------|-------|--------|--------------|---------------|------|------------|--------------------------------|----------|---------------------|----------------------|----------------------|---------------------|---------------------|
| 1           | Aldoory 2016           | NA      |       | x         | x                    |                       |                    |                 |               |             |               |             |           |         |      |      |        |                 |               |     |           |                                |          |                     |                      |                      |                     |                      |
| 2           | Bachar 2006            | Cherokee Choices/REACH | x      | x      | x                     |                       |                    |                 |               |             |               |             |           |         |      |      |        |                 |               |     |           |                                |          |                     |                      |                      |                     |                      |
| 3           | Bellow s 2006          | Family Fun with New Foods | x      | x      | x                     | x                     | x                  | x               | x              |             |               |             |           |         |      |      |        |                 |               |     |           |                                |          |                     |                      |                      |                     |                      |</p>
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Application for Exemption from Institutional Oversight

All research projects using living humans as subjects, or samples or data obtained from humans must be approved or exempted in advance by the LSU AgCenter IRB. This form helps the principal investigator determine if a project may be exempted, and is used to request an exemption.

- Applicant, please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the LSU AgCenter IRB. Once the application is completed, please submit a hard copy or attached to e-mail to the chair, Dr. Michael J. Keenan, in 209 Knapp Hall; mkeenan@agctr.lsu.edu

A Complete Application Includes All of the Following:
(A) A copy of this completed form and a copy of parts B through E.
(B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1 & 2)
(C) Copies of all instruments and all recruitment material to be used
   - If this proposal is part of a grant proposal, include a copy of the proposal.
(D) The consent form you will use in the study (see part 3 for more information)
(E) Beginning January 1, 2019: Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing and handling data, unless already on file with the LSU AgCenter IRB.

Training link is: (https://about.citiprogram.or/phomepage/). You can take either biomedical or social and behavioral. Once LSU or LSU AgCenter is selected as the institution, all fees will be waived.

1) Principal Investigator: Linda Fergus, MS RD LD N Rank: Graduate student Student? Y/N _ Y_ Dept: Nutrition and Food Sciences Ph: 225-803-0043 E-mail: lfe21@lsu.edu
2) Co-Investigator(s): please include department, rank, phone and e-mail for each
   - If student as principal or co-investigator(s), please identify and name supervising professor in this space - Denise Holston, PhD, RD
3) Project Title: Developing Social Marketing Messages for SNAP-Ed based on the Theory of Planned Behavior
4) Grant Proposal? (yes or no) _ no_ If Yes, Proposal Number and funding Agency
   - Also, if Yes, either: this application completely matches the scope of work in the grant Y/N _ OR more IRB applications will be filed later Y/N _
5) Subject pool (e.g. Nutrition Students) SNAP-Ed participants > 18 years old
   - Circle any “vulnerable populations” to be used: (prisoner, fetus, children<18, or mentally impaired). Projects with incarcerated persons cannot be exempted.
6) PI signature _ Date 11/15/19 (no per signatures)
   **I certify that my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU AgCenter institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at the LSU AgCenter for three years after completion of the study. If I leave the LSU AgCenter before that time the consent forms should be preserved in the Departmental Office.

Committee Action: Exempted _ Not Exempted _ IRB# HE 19-3 _

Reviewer: Michael Keenan Signature: _ Date 1-30-2019 _

APPENDIX B: SUPPLEMENTAL DATA FOR CHAPTER 3

3.1 IRB Approval
3.2 Publication – first and last page

Article
Healthy Eating in Low-Income Rural Louisiana Parishes: Formative Research for Future Social Marketing Campaigns

Linda Fergus 1,2, Richie Roberts 2 and Denise Holston 1,2

1 School of Nutrition and Food Sciences, Louisiana State University AgCenter, Baton Rouge, LA 70803, USA; DFergus@Agcenter.lsu.edu
2 Department of Agricultural and Extension Education and Evaluation, Louisiana State University, Baton Rouge, LA 70803, USA; Robertsbe@lsu.edu

Abstract: High rates of obesity and chronic disease exist in the southeastern United States (US). Knowledge about the attitudes, beliefs, and barriers of the rural low-income Louisiana population regarding healthy eating is limited. Focus Group discussions based on the Theory of Planned Behavior (TPB) were conducted in rural parishes (N = 5) with low-income residents of Louisiana (N = 38). Grounded Theory methods and cross-case analysis were used. The participants were primarily single black females of age 18–50 years who earned a high school diploma, were employed, and had children. Beliefs included healthy eating was physically beneficial, yet financial impacts and the low palatability of healthy foods were barriers. Professional resources for nutrition education were limited which led to reliance on friends, family, and the internet. Friends and family were positive and negative influences on eating choices. Control beliefs included the high prices of and low palatability of healthy foods, the wide availability of Energy Dense Nutrient Poor (EDNP) foods, and low motivation to sustain eating behavior changes. Formative research to optimize campaign distribution channels may improve accessibility to social marketing support and healthy eating resources. Descriptive messages that address control beliefs are needed in social marketing campaigns for rural low-income Louisiana environments.

Keywords: rural population; low-income population; healthy eating; theory of planned behavior; social marketing

1. Introduction

Consuming a healthy diet that adheres to the Dietary Guidelines for Americans (DGA) is associated with decreased mortality in residents of low-income areas of the southern United States (US) [1], even though higher obesity and chronic disease rates exist for the southeast US region [2–5]. Rural residents of the southeastern US exhibit sufficient knowledge of a healthy diet [6–8], yet knowledge frequency does not translate into adequate intake of fruits and vegetables, whole grain foods, and dairy products [9–11]. Environmental factors such as high prices of healthy foods [6,12–15] and shortages of produce [6,12,16] in rural stores reduce healthy food purchases. As a result, more rural residents are outshopping in search of variety, better quality, and lower prices of food [6,12,15,16]. One barrier to healthy eating is readily available Energy Dense Nutrient Poor (EDNP) foods [7,13,14,17]. The need for convenient meals [7,13,14], preferences of friends and family [9,7,16], and familiar taste predictions also influence food choices of low-income rural southeast US residents [6,8,14]. People living in rural and remote low-income environments outside of the US report high prices of healthy foods [18–21], low quality of produce [18,20], readily available highly palatable EDNP foods [18–22], and the importance of maintaining traditional ways to obtain food, such as hunting, fishing, or gardening [18,22].
60. Tracy, S.J. Qualitative quality: Eight “big-tent” criteria for excellent qualitative research. Qual. Inq. 2010, 16, 837–851. [CrossRef]
3.3 Focus Group Questions

<table>
<thead>
<tr>
<th>TPB construct</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>1. What do you think of when you hear the words “healthy eating”?</td>
</tr>
<tr>
<td>Attitude/Subjective norms</td>
<td>2. Who do you ask or “look to” for guidance about what to eat? Probe</td>
</tr>
<tr>
<td>Attitude</td>
<td>3. If you chose to eat healthy, how would it affect you and your life?</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>4. If you chose to eat more fruits and vegetables what would your family say? What would your friends say?</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>5. If you wanted to buy and prepare healthy foods, what barriers or obstacles may prevent you from being successful? Probe.</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>6. If you wanted to eat healthy, would you be able to? Why or why not?</td>
</tr>
<tr>
<td></td>
<td>7. If you wanted to be physically active, would you be able to? Why or why not?</td>
</tr>
<tr>
<td>Attitude/Subjective Norms</td>
<td>8. What would it be like or feel like if you were to change your eating habits or your physical activity habits? What would your family and friends say?</td>
</tr>
<tr>
<td>Intention</td>
<td>9. Do you have a plan to eat more healthfully? Why or why not? If so, how would you make it happen?</td>
</tr>
<tr>
<td>Intention</td>
<td>10. Do you have a plan to get more physical activity? Why or why not? If so, how would you make it happen?</td>
</tr>
</tbody>
</table>
3.4 Codebook: Invivo, Emotion, and Theory of Planned Behavior codes

"alot of stuff I need " in one store (Walmart)
"barely eat healthy"
"I am allergic to bananas, but I still eat them"
"like to go to fords...really good sales"
"ain't peanut butter good for you?"
"at Walmart. You can get everything in one place."
"better shape and your heart would be good"
"big bunches"
"breathe better, feel better, more energized"
"Brookshire's is nice"
"can you cook peanut butter?"
"don't like peanut butter"
"eat alot of fruit."
"food pyramid, google...could ask WIC office or health unit"
"foods I like"
"fords...I have alot of kids so we go stock up"
"good food, good deals, good prices"
"good price on things from winter"
"healthy eating is fruit and nuts."
"honestly, I don't even eat healthy"
"honestly, I really don't eat much"
"I ain't throwing it away, I paid too much for it."
"I am physically active. I play basketball everyday. I walk"
"I can't take my kids to the store"
"I dance"
"I dance...stuff to stay active"
"I don't eat healthy"
"I don't grocery shop"
"I eat peanut butter raw with a spoon."
"I eat peanut butter with apples."
"I go to Sam's...maybe an hour" from Winnfield
"I had the fish in the box and a lot come in it. It's big, too."
"I heard my heartbeat yesterday. I was scared. It was going so fast."
"I like shopping at Walmart"...discount stores
"I like to eat good" "I eat a salad here and there"
"I love google"
"I try to keep my business in the parish"
"If you want to do something, you just have to put your mind to it"
"It's cheap"
"It's just me on my own. I can put ziploc bags with meat up and have it for a month"
"just because you are skinny does not mean you are healthy."
"like to shop at Walmart"
"like to shop at Walmart…like when they do the markdowns"
"like Walmart... Prices are reasonable, you can find everything. They match the price."
"makes trip every Monday to Sam's"
"me either" - talking about not eating healthy
"more variety"
"my child eats fruits"
"my mom has some plants"
"nasty food"
"no"...peanut butter is not good for you.
"re fords...always have great deals"
"shop at Colfax. It's just like an hour, maybe"
"Super one...cheapest prices, best meat...really clean, nice kept store"
"that ain't no healthy food"
"the quality of food and cleanliness of the store makes a difference to me."
"their food tastes healthy"
"they have quantities of meat up there...you get your money's worth and it's cheap"
"what would your boyfriend say"
"what you going to do in the middle of the night when you wake up and want some sweets"
"when I am shopping, I like to eat the grapes..."
"Winn Dixie has coupons and sales"
"Winn Dixie has good cakes."
"wouldn't be tired all the time, you would think clearly"
"wouldn't have this gut and would be playing football" if I ate healthy
"you can get things for $1 or $3"
"you can melt it" (peanut butter)
"you get a discount with a grocery card...and get something for a penny"

Acceptance

Ambiguous - smoothie diet was expensive, but I felt better

Anger

Anticipation

Anticipation - positive response from family

Attitude - "healthy eating" is certain foods

Attitude - "healthy eating" is eat less salt

Attitude - "healthy eating" is portions

Attitude - “I don't shop"

Attitude - dislikes stores with poor quality food

Attitude - healthy eating

Attitude - healthy eating - small changes, better for you

Attitude - healthy eating: "taking time on shopping"

Attitude - healthy eating: "physical benefits for health problems that I have"

Attitude - healthy eating: "spend more on food, especially fruit"

Attitude - healthy eating: "would help me"

Attitude - healthy eating: “not as expensive as you think”

Attitude - healthy food - distance to store effects purchases

Attitude - it's not stealing if I pay for the food

Attitude - it's not stealing if the bag is open

Attitude - like lower prices
Attitude - like to eat good food
Attitude - positive for good food, discounts, good prices
Attitude - stores that I like
Attitude- change positive - feel better physically
Attitude- eat while I shop
Attitude- healthy eating - "train children to eat healthier"
Attitude- healthy eating - not necessary due to food scarcity
Attitude- healthy eating "help my energy"
Attitude- healthy eating “it affects my life...takes more time"
Attitude- healthy eating negative effect on budget
Attitude- healthy eating negative effect on time
Attitude- healthy eating negative taste
Attitude- healthy eating positive effect on children
Attitude- healthy eating positive effect on health
Attitude- healthy eating positive effect on life
Attitude- healthy eating stick to frozen fruits and vegetables to avoid waste
Attitude- healthy eating some meat not healthy
Attitude- healthy food likes large selection at supermarkets
Barrier buy/prepare - different food preferences at table
Barrier buy/prepare "got to have some kind of meat in those greens"
Barrier buy/prepare "one wants one thing and one wants another"
Barrier buy/prepare "price"
Barriers - none; feeling determined
Barriers - would you be able to eat healthy "yes ma'am"
Barriers "...hide the cookies because I will wake up and eat them in my sleep."
Barriers "end of long day. Don't feel like it"
Barriers "everything's addictive to me, but not healthy food."
Barriers "impulsive...need something quick to eat"
Barriers "it just be what he be seeing in his brain"
Barriers "junk food"
Barriers "msg releases a chemical in your brain that makes it (junk food) addictive."
Barriers "no time to meal prep"
Barriers "no, I exercise everyday"
Barriers “I can eat healthy all day long, but at midnight, I'm eating a whole box of oreos."
Barriers and obstacles to eating healthy
Barriers buy/eat healthy "someone coming around with fatty foods and making you want it."
Barriers buy/eat healthy “I don't think I could do it everyday, but I can on some days"
Barriers buy/prepare "they can put all kinds of barricades or whatever they want up there, but I just do it."
Barriers buy/prepare "you can substitute the taste of salt with seasonings"
Barriers buy/prepare fruits and vegetables "it's hard getting them home. They get bruised...it's a long trip to make and it gets hot."
Barriers eat/buy healthy "...don't feel like cooking or waiting for meat to thaw out."
Barriers eat/buy healthy “I love salad. I got to have ranch and it's got to be alot"
Barriers jealous of someone coming around with fatty foods
Barriers pa - "it's like finding the time because of work and you are active"
Barriers pa - “I do. We have a walking trail.”
Barriers pa "all the work I be doing out here, ...is my exercise"
Barriers pa "hard to exercise when you have a family and ...have to take care of your family"
Barriers pa "health is mine. I have bad hips and bad knees and bad ankles"
Barriers pa "juggle having to cook, having to exercise, having to take the time"
Barriers pa "my kids keep me going some with sports"
Barriers pa "time and physical (health)"
Barriers pa "you can walk the track here"
Barriers pa “I have the time, but I have a bad knee right now"
Barriers pa “I walk 2 miles a day. I walk at work"
Barriers to buy /prep "free fertilizer to farmers...super refined human sewage."
Barriers to buy/pre "some things are so high"
Barriers to buy/prep "and now everything has got e. Coli. Lettuce is getting e.coli. "
Barriers to buy/prep "chocolate is my downfall"
Barriers to buy/prep "family member telling you they don't wan't that"
Barriers to buy/prep "it will look all pretty in the store and when I get home it's all brown. (and smushy)."
Barriers to buy/prepare - "it will look smaller or not in season or not fresh"
Barriers to buy/prepare - dissatisfaction/satisfaction with taste of food
Barriers to buy/prepare "it's the prices. Fresh food costs a bit more and then it goes bad so fast."
Barriers to eating healthy -- " junk food"
Barriers to eating healthy "all the cheap candies for 99 cents"
Barriers to eating healthy "chips. I love chips so the salad is going to have to wait."
Barriers to eating healthy "chocolate right there and bananas right there and I am going with chocolate"
Barriers to eating healthy "oooh I am picking it up"
Barriers to eating healthy "see the stores be doing them bad"
Barriers to eating healthy "seeing other people eat it...makes me mad"
Barriers to eating healthy "so basically yourself"
Barriers to eating healthy "sweet tooth"
Barriers to eating healthy "they got the snacks in front of you before the good stuff, the fruits and vegetables"
Barriers to eating healthy "Walmart got their salads and all the fruit right there when you walk in the door, but by the registers is all the junk"
Barriers to eating healthy "you go to the store to buy a salad and when you walk to the salad, we see good ole jolly ranchers..."
Barriers to eating healthy "you got to push yourself not to do it"
Barriers to pa - "a child"
Barriers to pa - "my little baby brother whenever I got to watch him"
Barriers to pa "a child, yeah"
Barriers/prep "make it still taste as good as we want it to taste"
Behavior change/intentions "buy new food"
Behavior intention "a little at a time"
Belief- how I felt after not eating healthy
Beliefs about Walmart
Beliefs about Winn Dixie
Beliefs- calling out stealing
Betrayed
Binge-eating at night
Boyfriend subjective norm eat healthy "who are you trying to get skinny for?"
Budget-aware
Buy/eat healthy "would like to learn to meal prep"
Buy/eat healthy "I like thousand island, but I don't like fat free or lite"
Careless
Caring - to children by controlling sweets/fats
Challenged - eat fruits and vegetables; kids intake varies
Challenged to find a plan to eat healthy
Change behavior - "it would be hard"
Change behavior - "you have to make a plan"
Change eat healthy "substitute all white bread and crackers for wheat and instead of eating something fried, just eat it not fried."
Change eat healthy "I will tell you what is cool. A dehydrator."
Change eat healthy or pa - "if we ever stuck to it long enough, we would start to see and feel a difference."
Change eat healthy or pa - if you are eating healthier, you will have more energy"
Change eat healthy or pa- "I know when I exercise I feel better."
Change eating "we need to get an air fryer"
Change eating habits friends and family "great, you should have been doing that anyway."
Change eating habits friends and family "they would think it was good."
Change eating or pa “I think you would feel better."
Change habits friends and family - positive
Concern about food quality
Concern for food safety of fresh produce
Concern that family won't eat healthy foods, salads
Concern with maintaining produce quality in transit
Concerned about heartbeat
Confident - eat fruits and vegetables - friends and family love it
Confident - pa -
Conflicted
Conflicted - different food preferences at meal
Conflicted about what to eat
Conflicted over serving healthy food to family who doesn't want it
Contentment
Craving cookies at night
Dad is knowledgeable about nutrition and on track.
Defeated
Determination
Diplomatic
Disappointment
Disconnected
Discount stores
Dislike healthy foods "wheat bread is not good"
Dislike the taste of wheat bread, crackers
Dread
Drive an hour to shop
Eat fruit and vegetables friends and family say "at my house, if you don't eat it, you gonna starve."
Eat fruits and vegetables "if they don't want it, I'm still going to eat mine."
Eat fruits and vegetables friends and family - "my family would be completely happy with that."
Eat fruits and vegetables friends and family - positive
Eat fruits and vegetables friends and family "2 kids ok with it and 2 that I can't get them to"
Eat fruits and vegetables friends and family "it's hard to train those kids…the doctor even tell you don't make them eat it."
Eat fruits and vegetables friends and family "mine too. That's all they eat."
Eat fruits and vegetables friends and family "mine would love it"
Eat fruits and vegetables friends and family "mine wouldn't want it."
Eat fruits and vegetables friends and family "my family wouldn't eat it. If I make salads, I am the only one that eats it."
Eat fruits and vegetables friends and family "they would probably be good with it...my son and my fiance’ not happy. Son will not eat."
Eat fruits and vegetables friends and family "they would start eating it too."
Eat fruits and vegetables friends and family "trick them...buy only enough fruit for you." Eat fruits and vegetables friends and family say - "they would laugh"
Eat fruits and vegetables friends and family "I eat healthy alot, but I eat just one thing that's fried, and it wrecks the fact that I ate healthy."
Eat fruits and vegetables friends and family" I think my kids would like it. They like doing new stuff."
Eat health affect life "your digestion may be a whole lot better."
Eat healthy - able to? "yes, I would. I don't know if I would be able to keep it up though"
Eat healthy affect "totally...feel lighter, feel better. It affects you."
Eat healthy affect life "maybe your kids would see you eating healthy and they will follow suit"
Eat healthy be able? "need to do something like a challenge."
Eat healthy be able? "someone else doing it with me."
Eat healthy be able? “I would like my daughter to eat healthy when I am eating healthy."
Eat healthy, affect life - “I cannot make him eat something good for him."
Eat healthy, affect life "he eats meat and bread."
Eat healthy, affect your life "might live longer...feel healthier."
Eat healthy, perceived behavioral control - “I could eat healthier. But I still have to have my chocolate."
Eat too much -"miserably full"
Eat while shopping
Eating healthy affect "you are taking time to slow down on shopping. You can't just go get a package of weinees and a can of chili."
Empowered
Enjoyment for pa
Family subjective norm eat fruits and vegetables "mama...she would be happy"
Family subjective norm eat fruits and vegetables "mine would probably never realize it"
Family subjective norm eat fruits and vegetables "they probably wouldn't care"
Family subjective norm eat fruits and vegetables "they would be happy."
Family subjective norm fruits and vegetables- "they won't say nothing"
Family subjective norms eat fruits and vegetables "nothing"
Family subjective norms eat fruits and vegetables "yay"
Fear of msg affecting health
Feeling addicted to junk food
Feeling good about sharing healthy eating with daughter
Feeling impulsive about eating whatever is put in front of her
Feeling negative about making changes to food
Feeling ridiculed
Feeling supported by family
Feeling the need for support/partnership
Feeling unable to follow through with plans
Feeling unmotivated for pa - wants a buddy
Feeling unmotivated to eat healthy; need challenge
XX group appears tired and restless.
Flirtatious
Foods I dislike - wheat bread
Foods I learned to like
Foods I like - “I love salad so much”
Foods I like - wheat thins
Foods I like "and crawfish boils and beans...so good."
Foods I like "raw potatoes dipped in some Tony's is good."
Foods I like "salad in a mason jar"
Foods I like “I like pigtails, beans, and turkey necks.”
Foods I like- wheat
Forgetful
Friends and family better "it would be good."
Friends and family change "it would be better"
Friends and family change "it would be great"
Friends and family change "make things better for me...better for wife with diabetes."
Friends and family say "mine would be happier with me because my kids are more worried about my health"
Friends subjective norm "alot of people don't eat healthy..."
Friends subjective norm eat healthy "what's wrong with you?"
Frustrated
Frustration with getting son to eat healthy foods
Google - good site "look at the links."
Google "it is up to us to choose what link we pick."
Google "people can put anything on the internet"
Google "read the first couple of lines and you can tell how it's worded"
Google "there is so much information out there."
Google "they do the most popular first."
Google "they don't do the best people first"
Google “I don't think google is very good.”
Google good site "look at address at the bottom"
Grocery shopping is "a huge chore"
Grocery shops at several stores
Guidance - school "sends paper home with nutrition on it. Ingredients, too"
Guidance "common knowledge. What we have been taught"
Guidance "general conversation with people you come in contact with"
Guidance "google"
Guidance "mother-in-law"
Guidance "my dad"
Guidance "my doctor"
Guidance "the internet - I go to google"
Guidance "the internet - I go to google...get recipes"
Guidance "the internet"
Guidance "the news...food recalls"
Guidance "the WIC office"
Guidance "watch obesity show on tv...my 600 pound life"
Guidance about nutrition - common knowledge "school and health"
Guidance doctor "they always give you a sheet and a guide"
Guidance on what to eat - "doctor"
Guidance subjective norms - dad
Guidance subjective norms - food guide pyramid
Guidance subjective norms - general people
Guidance subjective norms - mother-in-law
Guidance subjective norms - my 600 pound life
Guidance subjective norms - rely on what they learned in past
Guidance subjective norms - the doctor
Guidance subjective norms - the internet
Guidance subjective norms - the news
Guidance subjective norms - WIC office
Guidance subjective norms - WIC office or health unit
Guidance subjective norms none
Guidance subjective norms -school
Guidance what to eat "Mr. Alexander", teacher at youth build
Guidance what to eat "my big brother. He is a freak with being healthy."
Guidance what to eat "your health teacher"
Guidance what to eat "your stove"
Guilt
Habitual with salad
Happy
Health eating effect "it wouldn't affect me. It would help me."
Healthy- wheat comments
Healthy "stuff" ..spend alot of money, go back before end of week, it goes bad"
Healthy eating "protein and eggs" are healthy
Healthy eating "red meat is food for you in small portions"
Healthy eating - ambivalent
Healthy eating - negative
Healthy eating "chicken is good for you"
Healthy eating "in portions."
Healthy eating "it is to cut back, eat less salt."
Healthy eating "my child eats fruits"
Healthy eating "salads fruits. A variety of things that you are supposed to have."
Healthy eating "whatever it is that you are going to eat, it's just needs to be in moderation"
Healthy eating "your bread...your cereals with the grains and fibers. That's good for the kids"
Healthy eating "your proteins, your meats, and your vegetables."
Healthy eating “I don't think I need to eat healthy. I need to gain weight”
Healthy eating affect me "you could teach and train the kids"
Healthy eating effect "...make the food that is healthier cheaper than the fast food."
Healthy eating effect "got to spend more to be healthy"
Healthy eating effect "got to spend more towards that food"
Healthy eating effect "help my energy"
Healthy eating effect "it's not as expensive as you think it is"
Healthy eating effect "not as expensive as you think"
Healthy eating effect "the healthy eating helps your cholesterol and everything. That's all that really matters. You know, and then your weight loss. It helps a lot.
Healthy eating- effect spend more, feel better
Healthy eating effect" in many ways. Eating healthy takes more time"
Healthy eating is "fruits and fruit trays"
Healthy eating is "fruits and vegetables"
Healthy eating is "salad"
Healthy eating is "small portions."
Healthy eating is "specially prepared pizza".
Healthy eating is moderation.
Healthy eating means "are ramen noodles bad for you"
Healthy eating means "fruit".
Healthy eating means "pasta".
Healthy eating means "rice". "shrimp fried rice"
Healthy eating means "salad. I love salad".
Healthy eating means "vegetables."
Healthy eating means a variety of foods we are supposed to have.
Healthy food “I don't like how it tastes."
Healthy food effect - spend more
Hopeful eating healthy will help energy level
Humorous
Ignored
Impulsive
Impulsive when feeling hungry
Indifferent - eat fruits and vegetables; f/f don't want it. “I will still eat it"
Indignant
Influence of taste preferences on food selection
Influential on family's eating
Inquisitive
Inspired
Instructive to children
Intention
Intention “I am going to start doing what I told you ...mango Monday..”
Intention - change what I buy to something more healthy
Intention - eat less salt
Intention - focus on healthy breakfast
Intention - learn how to cook healthy things
Intention - meal prepping
Intention - stop frying everything
Intention -" I am going to eat a vegetable a day"
Intention "drink water every day"
Intention "eat one healthy vegetable or fruit a day"
Intention "if I was to keep going...I would still be healthy"
Intention "instead of going on the snack aisle, go on the veg aisle"
Intention "maybe you could have one cheat day out of the week"
Intention "my grandmother had a big garden"
Intention "yeah you can take it one step at a time"
Intention baked food
Intention eat healthy - put my mind to it
Intention how "chop up cucumbers and put in vinegar"
Intention how "stay focused"
Intention make it fun "like mango Monday"
Intention pa - bike, other options
Intention pa - get with group that has common interests
Intention pa - I am just going to do it
Intention pa - meal prep, exercise, no SSBs
Intentions "take the junk food out of your house, throw it away, or give it away"
Intentions pa - playgrounds, family
Judgmental
Keen
Large group of participants in Winn county
Like to buy in bulk, alot of variety
Like wheat - wheat thins
Logical
Loves store with good deals, good prices
Misunderstood
Model healthy behavior
Mother-in-law is helpful
Motivated - my health problems and my doctor stays on me
Motivated by 600 pound life
Negative - consume less, hungry later
Negative physical feelings when eats unhealthy
Negative reaction to parental modeling
No barriers to pa - "my kids just go with me"
Optimistic - "it's not as bad as you think" - food cost
Overwhelming
Pa - feeling committed
Pa - hard; no time. Feeling challenged
Pa barriers "work, cooking, doctor's appointments, time"
Pa committed
Pa intention "3 days a week walk, jog, basketball"
Pa intention "a 100 push ups sometimes"
Pa intention "chasing after a baby"
Pa intention "dancing is exercising, right"
Pa intention "walk, jog, do squats"
Pa intention "I exercise kind of alot"
Pa no barriers "I take (my kids) with me"
Pbc - personal preferences of friends and family
Pbc - the msg releases a chemical that makes food addictive
Pbc - amount of salt in preferred seasonings
Pbc - bruising, heat on the trip home
Pbc - cooking skills overcome barriers
Pbc - eat healthier, but still have my chocolate
Pbc - eat healthy on some days, not all
Pbc - food must be seasoned or I will not eat it
Pbc - meal prepping
Pbc - need someone to eat healthy with me
Pbc - needs to be a social media challenge
Pbc - pa - positive effect of kids sports
Pbc - pa - safe places to exercise
Pbc - pa health factors decrease pa
Pbc - price
Pbc - substitutions for salt
Pbc - support of daughter (10yo)
Pbc - taste of modified cultural foods
Pbc - the fruit is smaller, not in season, or not fresh
Pbc - walking at work, not pa at home
Pbc buy/prepare healthy foods prices, waste fresh foods, distance
Pbc dislike diet or lite salad dressing
Pbc- long days at work
Pbc pa - no time
Pbc- poor health and fear of death effect pbc
Pbc-people that aren't dieting
Perceived behavioral control - fear of E. coli
Perceived behavioral control - I can't eat wheat bread
Plan - "i'm getting older...i have to take better care of myself. I need structure, health, and guidance."
Plan - "to have someone do it with you, I feel like if I had a buddy."
Plan - “I have a plan. I just have to follow through with it.”
Plan - no plan
Plan - problem is follow through
Plan "if something is cooked in front of me and it looks good, I'm going to eat."
Plan "motivation" from holding each other accountable
Plan “I am going to talk to __ about this. We have to make a change and start eating healthier."
Plan "I am going to talk to __ about this. We have to make a change and start eating healthier."
Plan eat healthy - "put my mind to it."
Plan eat healthy "breakfast is supposed to be the most important meal of the day. If I could do
like I say, it's no problem."
Plan eat healthy "don't fry anything. Bake it or grill it."
Plan pa "I'm going to start...i have enough time. "
Plan pa "it's a collective thing. That helps"
Plan pa "now everybody has something mobile...and they don't think about walking."
Plan pa "there's lots of new equipment in the playgrounds now."
Plan pa "when you have support from everybody else and you are trying to do it together then it
makes it better."
Plan pa “I am just going to do it."
Plan pa “I want to and need to (exercise)"
Plan pa get a buddy to walk with me
Plan to eat healthy "always make something where you can have some of it later"
Plan to eat healthy "and another thing that's not good is those microwavable dinners"
Plan to eat healthy "don't have time to cook and I'm hungry ... Drive thru. That's my problem."
Plan to eat healthy "eat what I cook for him (family has hypertension)"
Plan to eat healthy "keep something around"
Plan to eat healthy "meal-prepping"
Plan to eat healthy "need to get a pork roast that don't have fat in it"
Plan to eat healthy "smaller portions? Your body gets used to it"
Plan to eat healthy "you can only eat so much in your person"
Plan to eat healthy “I don't like frying anything."
Plan to eat healthy “I like baked food"
Plan to eat healthy “I would just put my mind to it"
Positive attitude about eating healthy and stores
Positive- eat fruits and vegetables. Kids love "doing new stuff"
Practical
Questioning commitment to healthy eating
Quitting "you taste buds, they gonna want that good ole mashed potatoes and gravy, red beans
and rice, cornbread"
Re: google "you have to be careful what you look at..can't be random. Got to be a good site"
Realistic
Regret
Resignation - exercise daily
Resignation - spend more on healthy food, especially fruit
Responsible
Responsive
Ridiculous portion size of chocolate
Rural small Louisiana town
Sarcastic
Scared into healthy eating by MD
Self-control
Self-willed
Shopping - cautious with quantities of fresh food
Shopping with a baby "he is with me all the time and he's always...when you take something from him, he's crying"
Shopping with a baby "it's hard. They just grab, grab, grab"
Shopping with baby "why not just give it to him?"
Shopping with baby "gets my head all twisted...forget what I went for"
Shopping with baby "take him to the healthy section, he won't grab something'
Shopping with kids - challenges, limitations
Shopping with kids - need family support, do without healthy foods
Sincere
Skeptical - eat fruits and vegetables - friends and family don't want it. "get something else."
Skeptical - eating healthy takes time
Skeptical - food that is healthier should be cheaper than fast food
Skeptical - shopping, label reading take time
Spontaneous- healthy kick
Starting something new - "and then you might not finish it"
Stick with "frozen or canned vegetables because it goes bad"
Subjective norm eat fruits and vegetables friends and family - "don't make them eat it, waste"
Subjective norm friends eat healthy "they would ask what is wrong with me"
Subjective norms - eat fruits and vegetables positive effect, family will eat fruits and vegetables too
Subjective norms change positive
Subjective norms eat fruits and vegetables - some ppl in family will not be happy
Subjective norms eat fruits and vegetables - friends and family - determined to eat fruits and vegetables in spite of negative friends and family
Subjective norms eat fruits and vegetables - friends and family - negative don't want or need it
Subjective norms eat fruits and vegetables - friends and family will laugh
Subjective norms eating fried food / house mates
Subjective norms family - negative for healthy foods
Subjective norms for eating fruits and vegetables "mom" "grandmother"
Subjective norms friends and family - eat fruits and vegetables positive
Subjective norms fruits and vegetables - try reverse psychology with children
Subjective norms of friends and family - positive subjective norm boyfriend Sam's buy in large quantities
Thoughtful
Thoughtful - plan to eat healthy
Thrifty
Togetherness, social support for pa
Trepidatious - "seems like" you have to spend more to be healthy
Trusting info on google - a decision making process
Trusting the news
Truthful - what is healthy
V - stores with discounted prices and coupons
V - time management
V- money management
Vegs “I make do without it or sometimes my fiancé ...watches the kids”
Wanting good food - use air fryer
Wanting good food - use dehydrator
Wary
Wasteful- eat fruits and vegetables; kids won't eat and can't force them to
What is hard - "sometimes you eat more food and then you eat less food."
Why would you be able to eat healthy - "because that is what I want to do"
Would you be able to eat healthy “I can't eat wheat bread or wheat crackers."
| **TO:**       | Fergus, Linda                      |
|              | LSUAG | Dept | Nutrition and Food Sciences |
| **FROM:**    | Michael Keenan                     |
|              | Chair, Institutional Review Board  |
| **DATE:**    | 09-Oct-2020                         |
| **RE:**      | IRBAG-20-0034                       |
| **TITLE:**   | Conjoint Analysis of Behavioral    |
|              | Economics elements in Social       |
|              | Marketing Campaigns (New Protocol  |
|              | Created for Linda Fergus on        |
|              | 06-Oct-2020 10:40 AM)              |
| **SUBMISSION TYPE:** | Initial Application |
| **Review Type:** | Exempt                           |
| **Risk Factor:** | Minimal                           |
| **Review Date:** | 09-Oct-2020                      |
| **Status:**  | Approved                           |
| **Approval Date:** | 09-Oct-2020                      |
| **Approval Expiration Date:** | 08-Oct-2023                   |
| **Re-review frequency:** | (three years unless otherwise stated) |
Number of subjects approved: 400

LSU Proposal Number:

By: Michael Keenan, Chair

Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
8. SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.

* All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents.

Mike Keenan O 225-578-1708209 Knapp Hall
Baton Rouge, LA 70803
O 225-578-1708
F 225-578-4443
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VITA

Linda Gail Fergus earned a Bachelor of Science degree in Dietetics at Louisiana State University in May 1989. Linda completed the Houston VA Medical Center Dietetic Internship in August 1990 and earned a Master of Science degree in Nutrition and Food Science from Texas Woman’s University in December 1990. Linda passed the Commission of Dietetics Registration exam in April 1991 and began practicing as a Registered Dietitian where she has worked primarily in clinical settings for many years. Linda will earn her PhD in Human Nutrition in December 2021.