

**Pilot Findings from a Randomized Controlled Trial Targeting Sugar-Sweetened
Beverage Behaviors**

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Thesis submitted to the faculty of Virginia Polytechnic Institute and State University in
partial fulfillment of the requirements for the degree of

Master of Science
In
Human Nutrition, Foods and Exercise

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March 27th, 2012
Blacksburg, VA

*Keywords: randomized controlled trial, health literacy, health behavior,
sugar-sweetened beverages*

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ABSTRACT

Background: Low health literacy and increased sugar-sweetened beverage (SSB) consumption are two broad public health concerns facing the United States. For example, it is estimated that 90 million Americans have insufficient literacy skills (*IOMC, 2004*) and low health literacy is associated with poorer health outcomes (*Berkman et al., 2011*). Furthermore, SSBs contribute about 80% of added sugars in the diet (*Nielsen & Popkin, 2004*) and have been associated with poor health outcomes, including obesity, type II diabetes, bone fractures, dental caries, and coronary heart disease. Despite these findings, there is limited research related to how to effectively decrease SSB intake among adults. Additionally, there have been few studies investigating health literacy interventions that target health behaviors in community settings (*Allen et al., 2011*). **Objective:** As guided by the Theory of Planned Behavior (TPB) and constructs of health literacy, this 5-week, 2-arm randomized controlled pilot trial, used mixed methods to examine the effects of an intervention to decrease SSB (SipSmartER), as compared to a matched-contact control condition targeting physical activity (Move More). The primary aims of this pilot project were to evaluate participant's feedback through process and summative evaluation as well as evaluate intervention content and/or delivery through process evaluation by staff tracking for quality improvements. Secondary aims included the assessment of changes in theorized mediating variables and health behaviors among participants. **Methods:** Twenty-five participants (mean age = 42 ± 14 years, mean BMI = 34.3 ± 7.5 kg/m², 19 females, 12 African Americans, 9 <high school education) residing in Roanoke, VA were randomized to either SipSmartER (n=14) or Move More (n=11) to begin the 5-week intervention. Inclusion criteria consisted of participants being 18 years of age or older, English speaking, consuming greater than 200 kcal/day of SSB, and being without medical conditions in which physical activity would be contraindicated. Both 5-week interventions included two interactive small group sessions (Weeks 1 & 5) and three support telephone calls (Weeks 2, 3 & 4). Pre-post data was obtained using previously validated instruments including Beverage Intake Questionnaire (Bev-Q), Theory of Planned Behavior constructs addressing SSB and physical activity, media literacy, subjective numeracy, Stanford Leisure-Time Activity Categorical Item (L-CAT), and quality of life. Descriptive statistics, ANOVA, and regression models were used in data analysis. **Results:** Although SSB consumption decreased more among the SipSmartER participants (-257 ± 622.6 kcal/day) than Move More (-200 ± 404.6 kcal/day) there were no significant group by time differences. However, among all participants, changes in TPB constructs significantly predicted changes in SSB ($R^2=0.592$; $F=2.485$; $p=0.080$) and physical activity behaviors ($R^2=0.621$; $F=2.813$; $p=0.056$). Participant and staff feedback were very positive, ranging from 4.2-5.0 on a 5-point likert scale that included questions about intervention organization, flow, effectiveness, engagement,

and enjoyment. Favorite themes that emerged with SipSmartER participants when asking about small group sessions included, realizing how much sugar is found in SSBs, understanding the health risks associated with drinking too much sugar, realizing how much sugar was being consumed during the day, and learning about better alternatives. **Conclusion:** Findings suggest promise for the piloted intervention to reduce SSB consumption through targeted TPB and health literacy strategies. This pilot study has allowed further refinement and execution of a larger trial that includes a larger sample and longer study duration (i.e. 6-months) and follow-up period (i.e. 18-months).

Acknowledgements

I would like to thank the Human Nutrition, Foods and Exercise Department for their support throughout my undergraduate and graduate career at Virginia Tech. Special thanks to my advisor, Dr. Jamie Zoellner, for her guidance over the past two years and my committee members, Dr. Paul Estabrooks and Dr. Yvonne Chen. I would also like to thank my husband, Ricky, and my parents, Wes, Amy, and Kim for their love and support during my college endeavors.

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CHAPTER 1

Literature Review

Health Literacy: A Public Concern

In today's society it is estimated that 90 million Americans have insufficient literacy and numeracy skills to correctly interpret and navigate through our healthcare system (*IOMC, 2004*). Being an extensive and multifaceted concept, health literacy has been described in many ways (*AMA, 2011*), but is most commonly defined as "the degree to which individuals have the capacity to obtain, process, and understand the basic health information and services needed to make appropriate health decisions" (*Healthy People, 2010*). Low health literacy is associated with poorer health outcomes and poorer use of health care services (*Berkman, 2011; Dewalt, 2002*). For example, low health literacy has been associated with individuals having less health knowledge, a lower quality of overall health, increased health care visits, and increased health care costs (*IOMC, 2004*). Furthermore, it has been projected that the United States could spend an additional \$50-73 billion dollars each year in health care costs as a result of limited health literacy (*IOMC, 2004*). In light of these documented associations and potential health care costs, effective strategies need to be developed and implemented to address health literacy barriers.

Low health literacy is most often associated with the elderly, minority groups, lower education, lower income level, and individuals without health insurance (*IOMC, 2004*). Moreover, these characteristics of low health literacy are also consistent with most rural populations. Current health literacy research is commonly geared towards a

clinical perspective, with little emphasis on community-based interventions targeting health promotion or disease prevention (*Allen et. al, 2011*). As evidenced by Allen and colleagues (2011), only one community-based health literacy intervention has been identified (*Ntiri & Stewart, 2009*). Currently, research on health literacy has concentrated on the following health behaviors: proper medication use, breastfeeding, smoking, problem behaviors in children and alcohol use (*IOMC, 2004*). Interventions targeting nutrition and physical activity behaviors within the community setting are lacking.

Health literacy has become a public health concern. Improving health literacy, “can save lives, save money, and improve the health and well-being of millions of Americans” (*Surgeon General, 2010*). This further represents the need to implement community-based interventions targeting health promotion or disease prevention.

Nutrition Numeracy and Media Literacy

Health literacy involves an array of individual level factors as well as social factors, including: cultural, conceptual, knowledge, listening, communication, mathematics, writing, and reading skills (*IOMC, 2004*). Two main constructs of health literacy include nutrition numeracy and media literacy. Numeracy is defined as the “ability to use and understand numbers in daily life” (*Rothman, 2006*), but is not well understood as a concept of health literacy (*Rothman, 2008*). Moreover, numeracy is an essential component in an individual’s ability to read and interpret nutritional information (*Rothman, 2006*). Furthermore, it is estimated that more than 110 million adults in the United States have limited numeracy skills (*Kutner, Greenberg, Baer, 2005*). As evidenced by Cavanaugh and colleagues (2009), health related numeracy is the ability

to “understand measurement, estimation, time, risk interpretation, and multi-step operations” (*Rothman, 2008; Golbeck 2005*).

There are limited studies examining numeracy and health status in individuals (*Cavanaugh et al., 2009; Zoellner, Connell, Bounds, Crook, Yadrick, 2009; Rothman et al., 2006; Huizinga, Beech, Cavanaugh, Elasy, Rothman, 2008*). To date, only one randomized control trial (RCT) has been completed (*Cavanaugh et al., 2009*).

Cavanaugh and associates (*2008*) were interested in exploring literacy and numeracy as part of an intervention component of a diabetes program. Their study consisted of two RCT, in which one group received “usual care” and the other group received “usual care” plus a tool-kit that included 24 modules that focused on blood glucose monitoring, nutrition management, foot care, and administration of medications (*Cavanaugh et al., 2008*). The tool-kit included numeracy-sensitive information that included step by step instructions, pictures, color coded information and text that read at a 6th grade reading level. Lastly, intervention staff who was responsible for educating participants received two training sessions that concentrated on health literacy, numeracy and clear communication channels. Study results showed improvements in A1C levels in both groups at three months, but the intervention group showed greater improvements. There was no difference between the group’s A1C at six months (*Cavanaugh et al., 2008*). This RCT demonstrates that a health literacy and numeracy sensitive intervention can be effective short-term when addressing individuals with chronic diseases.

Two cross-sectional nutrition numeracy studies (*Rothman et al., 2006; Zoellner et al., 2008*) have been identified. Rothman and colleagues (*2006*) performed a cross-

sectional study examining the effects of nutrition numeracy and understanding food labels with 200 patients in a primary care facility (*Rothman et al., 2006*). Their results showed that 68% had some college education, 77% had greater than a 9th grade education level, but 63% of patients had numeracy skills less than a 9th grade level (*Rothman et al., 2006*). Conclusions indicated that participants with lower numeracy skills were African American, older, categorized into a lower income bracket, had less education, and lacked private insurance. Patient's numeracy skills were assessed via the Newest Vital Sign (NVS), and only 32% of patients could accurately calculate the amount of carbohydrates in a bottle of soda that contained 2.5 servings. This indicates that serving sizes are poorly understood. Lastly, factors were examined to determine why individuals have trouble with food labels and three important themes emerged: inappropriate use of serving size, confusion about what information to assess when looking at the nutrition facts panel, and error when calculating (*Rothman et al., 2006*). These are three main points to address in future health literacy interventions.

Additionally, Zoellner and colleagues (2008) performed a cross-sectional study examining nutrition numeracy across the Lower Mississippi Delta. Their primary objectives were to investigate numeracy literacy in relation to media channels, level of trust from nutrition sources, confidence about nutrition information, and barriers that participants face seeking nutrition information (*Zoellner, Connell, Bounds, Crook, Yadrick, 2008*). Their results showed that the most widely used source for obtaining nutrition information was television (57%), with television and doctors ranking highest in levels of trust. Lastly, 78% of participants ranked their health related knowledge as poor

or fair. Both of these cross-sectional studies provide relevant information that could help researchers carry out interventions successfully.

Along with nutrition numeracy, another important construct of health literacy is media literacy. Media literacy is defined as having the ability to access, analyze, evaluate, and create media in a variety of forms (*Aufderheide, 1993*). Evaluating media literacy is imperative when determining a person's literacy skills. Today, marketing of sugar-sweetened beverages (SSB) are universal. Television, radio, internet, grocery store and convenient store promotions and billboards all market SSB. Advertising is regulated at the federal level, but currently, there are no regulations regarding SSB (*CDC, 2010*). Moreover, the Institute of Medicine (IOM) has stated that beverage advertising plays a role in the consumption of unhealthy diets that Americans are consuming and unhealthy diets have been shown to cause poor health outcomes (*IOM, 2006*). Koordeman and colleagues (*2010*) supported these statistics with their study, which examined soda verses water commercials in relation to soda consumption targeting 51 female college students. Even though not statistically significant, findings showed that women exposed to soda commercials consumed 1.3 more ounces of soda than women exposed to water commercials (*Koordeman, Anschutz, Baaren, Engels, 2010*). Furthermore, two additional studies (*Thompson et al., 2008; Vereecken et al., 2005*) explored television watching and soda consumption and their results indicated that increased television watching was associated with increased soda consumption. Educating participants about exposure to media and explaining the influential tactics that media uses, such as bandwagon and use of celebrities to support products, can improve one's understanding, regarding advertising and marketing.

Alarming Rates of Sugar-Sweetened Beverage Consumption and Obesity

Along with public health concerns related to health literacy barriers, the rise in SSB consumption and the escalating obesity epidemic are two additional concerns. SSB, which include soft drinks, fruit drinks, sports drinks, tea and coffee drinks with added sugar, energy drinks, sweetened milk or milk alternatives, and any other beverage that contains sugar, contribute approximately 80% of added sugars in the diet (Nielsen & Popkin, 2004) and have been associated with the accelerating obesity statistics (Bray, Nielsen, & Popkin, 2004; Malik, Shulze, & Hu, 2006; Vartanian, Schwartz, & Brownell, 2007). Furthermore, SSB consumption has doubled between 1977 and 2002 (Duffey & Popkin, 2002; Brownell et al., 2009) and the rate of obesity has shown parallel effects, doubling between 1980 and 2004 (Flegal, 2002; Ogden, 2006). In addition, as 2015 approaches, it is predicted that 75% of American adults will be overweight or obese (Wang, 2007).

Not only has SSB intake shown corresponding results with obesity, but researchers have also associated SSB intake with type II diabetes (Schulze, Manson, & Ludwig, 2004), bone fractures (McGartland, Robinson, & Murray, 2003), dental caries (Heller, Burt, & Ekland, 2001; Ismail, Sohn, Lim, & Willem, 2009; Marshall et al., 2003, Sohn et al., 2006; Vartanian et al., 2005) and coronary heart disease (Fung, Malik, Rexrode, Manson, Willett, & Hu, 2009). Despite these findings, there has been limited research investigating health literacy status and SSB intake in response to the escalating prevalence of obesity. Zoellner and colleagues (2011) completed a cross-sectional survey examining the connection between health literacy and dietary quality. Targeting a community-based sample of 376 adults residing in rural Lower Mississippi

Delta, their primary objective was to assess health literacy status associated with Health Eating Index (HEI) scores and SSB consumption (Zoellner et al., 2011). Their results indicated that health literacy status was a significant predictor of both HEI scores and SSB consumption, concluding that for every 1 point increase in health literacy status, individuals drank 34 less calories from SSB and showed a 1.21 increase in HEI scores (Zoellner et al., 2011). These findings suggest that health literacy driven interventions are essential to explore further associations with SSB consumption. Future research needs to specifically look at individual's health literacy skills and how this influences their ability to make healthy choices.

Sugar-Sweetened Beverage Interventions

Adult Interventions

Only three known experimental studies examining SSB intake in adults have been documented (Stookey, Constant, Gardner, Popkin, 2007; Chen et al., 2009, Tate, 2012). Stookey and colleagues (2007) studied data from a secondary analysis from the Stanford A-Z intervention of 118 overweight women (25-50 years) who drank more than 12 fluid ounces of SSB per day. The purpose of their study was to assess participant's water intake as a healthier alternative related to SSB. Their findings suggested that drinking water in place of SSB can be an effective way to help individuals lose weight and decrease their waist circumference.

The second study by Chen and colleagues (2009) showed parallel results with a decrease in SSB intake correlating with weight loss. This study examined 810 adults who participated in the PREMIER trial, which was an 18 month intervention that tested

blood pressure lowering effects in participants who presented with pre-hypertension or stage 1 hypertension. Participants were assigned to one of three groups: “Advice Only,” “Established,” or “Established Plus DASH” (*Chen et al., 2009*). After distinguishing beverage patterns of the participants, results showed that SSB were the leading source of beverage calories. When compared with the other beverages, only reduction in SSB resulted in weight loss. Findings concluded that reducing 100 calories/day from liquid calories resulted in a 0.3 kg reduction in weight at 6 months and 0.2 kg reduction at 18 months. Furthermore, this study concluded that decreasing SSB by one serving each day correlated to a reduction of 1.8 mm Hg in systolic blood pressure and a 1.1 mm Hg reduction in diastolic blood pressure (*Chen et al., 2009*).

The most recent study performed by Tate and colleagues (2012) examined the effects of replacing caloric beverages with water or diet alternatives on weight status in 318 overweight and obese adults. Participants were randomized to three groups: 1) water group, in which participants substituted caloric beverages for water, 2) DB or diet beverage group, in which participants substituted caloric beverages for diet beverages, or 3) AC or active control group, in which participants did not substitute beverages. Results concluded significant mean reductions in weight among all three groups at 6-months (-2.5 kg in DB group; -2.0 kg in water group, -1.8 kg in AC group). Participants in both intervention groups (water and DB groups) decreased their SSB intake by two servings/day. Even though there were no significant differences between groups, this study shows that substituting caloric beverages for water or diet alternatives is an effective intervention for weight loss.

All three studies showed that reducing SSB consumption can have an impact on weight loss. One major limitation of each study is that each intervention involved no theory-based constructs and participant's health literacy status was not reported.

Adolescent/Children Interventions

Although there is limited research examining SSB interventions in adult populations, adolescents and children consuming SSB has been more widely explored. It has been reported that adolescents, aged 12-19 years, are the biggest consumers of SSB, drinking an estimated 224 kcal/day (Wang, 2008; Bleich, 2009). Interestingly enough youth are three times more likely to consume SSB, five or more times per week, if their parents consume SSB (Grimm, Harnack, Story, 2004). Furthermore, Striegel-Moore and colleagues (2005) performed a longitudinal study examining beverage consumption in 2,379 girls from childhood to adolescence and results showed that intake of SSB nearly tripled (Striegel-Moore et al., 2005). Lastly, research suggests that beverage patterns learned in early adolescence remain steady throughout adulthood (Kvaavik, Anderson, Klepp, 2005).

James and colleagues (2004) conducted a 12-month cluster RCT that included 644 children, aged 7-11 years of age (James, Thomas, Cavan, Kerr, 2004). Participants in the intervention group received four, one-hour long sessions throughout the school year that focused on discouraging the intake of carbonated drinks, sweetened and unsweetened. Researchers used a school-based educational program to administer the intervention. Results showed that the intervention group decreased their carbonated beverage intake when compared to the control group, but there was no change in BMI

between the two groups. In contrast, a study performed by Sichieri and colleagues (2008) found that decreasing SSB intake did reduce BMI in overweight children, especially girls (*Sichieri, Trotte, Souza, Veiga, 2008*). Researchers studied 1140, 9-12 year-old fourth graders, looking at the association between SSB and BMI. The intervention group was subjected to ten, one-hour long, healthy lifestyle education sessions during seven months. Each session presented healthy messages, promoting water intake compared to SSB intake. The control group received two, one-hour long sessions regarding health issues and healthy diets. Results showed no change in the intervention overall BMI compared with the control at baseline, but the intervention group did show a statistically relevant reduction in BMI (-0.4 kg/m^2 , $p = 0.009$) in overweight children, especially overweight girls. This study, along with a study by James and colleagues (2004) show that educational sessions offered in schools can be an effective way to decrease SSB consumption among children.

Potential Barriers to Reducing Sugar-Sweetened Beverages

Krzeski and colleagues (*in review*) completed 8 focus groups targeting 54 southwest Virginians and used the Theory of Planned Behavior (TPB) to investigate attitudes, subjective norms and perceived behavioral control among participants and their beverages. Qualitative data showed that the top barriers to reducing SSB were taste, habit/addiction, convenience/availability, and cost (*Krzeski et al., in review*). This data suggests that these four main barriers need to be addressed and further explored when implementing SSB interventions.

Environmental Influence

Today, SSB are everywhere. SSB are readily accessible in vending machines, schools, restaurants, worksites and at home. The CDC's Sugar-Sweetened Beverage Guide (2010) identified many social and environmental factors that have been associated with increased SSB consumption, comprising of marketing, increases in portion sizes, fast food eating, increased time watching television, parenting practices and parenting influences, and last but not least, access to SSB (CDC's *Sugar-Sweetened Beverage Guide, 2010*). It has been stated that 20% of SSB are consumed at worksites and 50% are consumed in one's household for adults aged 20-44 years (Bleich, 2009). As evidenced by the CDC's Sugar-Sweetened Beverage Guide (2010) they identified one community-based program in New York City that had set standards for meals, snacks, and beverages that were served throughout the city. Their requirements included less than 25 calories per 8 ounces of any beverage, excluding 100% juice and milk. All juices were required to be 100% juice, while the serving size could not exceed 6 ounces per serving for school aged children. Surprisingly, flavored milk was still considered an appropriate beverage as long as it did not exceed 130 calories per serving. It is apparent that the environment plays a significant role in consumer's lives and the beverages that are available. To further reduce SSB intake, environmental factors need to be addressed.

Artificial Sweeteners

An important barrier to address while executing SSB interventions is the use of artificial sweeteners, also known as non-nutritive sweeteners. Even though in the United

States, 9 out of 10 people purchase or use low-calorie products (*Bright, 1999*) that may contain artificial sweeteners, focus group data from southwest Virginia has shown a concern for these products (*Krzeski et al., in review*). Qualitative focus group data reported major themes about artificial sweeteners. Positive themes included: less calories and less sugar, taste, caffeine and positive health benefits. Negative themes included: concerns of cancer, headaches, body cravings, unpleasant aftertaste, unnatural, caffeine and inconsistent evidence (*Krzeski et al., in review*). Although many citizens in southwest Virginia stated these concerns, cancer being the most frequently mentioned, to date, there has been no scientific evidence linking the use of artificial sweeteners and cancer in humans (*ADA, 2004*). However, there is a large body of evidence supporting the consumption of SSB and poor health outcomes (*Bray, Nielsen, & Popkin, 2004; Malik, Shulze, & Hu, 2006; Vartanian, Schwartz, & Brownell, 2007; Schulze, Manson, & Ludwig, 2004; McGartland, Robinson, & Murray, 2003; Heller, Burt, & Ekland, 2001; Ismail, Sohn, Lim, & Willem, 2009; Marshall et al., 2003, Vartanian et al., 2005; Fung, Malik, Rexrode, Manson, Willett, & Hu, 2009*). The Food and Drug Administration (FDA) has approved the use of five artificial sweeteners. These include saccharin, aspartame, acesulfame K, sucralose and neotame. Even though the FDA has not established a recommended daily allowance (RDA) for artificial sweeteners, estimated daily intakes have been documented.

Acesulfame K was approved by the FDA in 1988 as a general purpose sweetener, with an adequate daily intake (ADI) of up to 15mg/kg bw/day (*ADA, 2004*). More commonly known, aspartame is another artificial sweetener that was approved by the FDA in 1981 as a sweetener in dry products and in 1983 was incorporated into

carbonated beverages. In 1996, aspartame was approved as a general purpose sweetener. Not only is aspartame found in dry products and carbonated beverages, it is also found in more than 6,000 other food, personal products, and pharmaceuticals (ADA, 2004). The FDA has established an ADI for aspartame of 50 mg/kg bw/day. Neotame, another type of artificial sweetener was approved by the FDA in 2002 with an ADI set at 18mg/day (ADA, 2004). Saccharin, or commonly known as the artificial sweetener in the brand name Sweet-N-Low, has been the only artificial sweetener pulled off the market due to its association with causing cancer in lab animals (ADA, 2004). With no conclusive evidence supporting this claim, the FDA approved saccharin as a sweetener with a recommendation of not exceeding 12 mg/fluid ounce (ADA, 2004). Sucralose, also known as Splenda, was approved by the FDA in 1999 as a general purpose sweetener (ADA, 2004). The FDA performed an evaluation of more than 110 research studies that examined the effects of sucralose and they concluded that it did not pose a threat for cancer, reproductive risks, or neurological concerns (ADA, 2004). The Position of the Academy of Nutrition and Dietetics states that “Non-nutritive sweeteners may assist in weight management, control of blood glucose, and prevention of dental caries and can offer consumers a way to enjoy the taste of sweetness with little or no energy and or glycemic response” (ADA, 2004). This information concludes that artificial sweeteners are safe, healthy alternatives that can help individuals decrease SSB intake.

Potential Strategies to Reducing Sugar-Sweetened Beverages

The CDC has implemented a guide identifying strategies to reduce SSB consumption. These strategies include: ensuring access to potable drinking water,

limiting access to SSB, promoting access and consumption of healthier alternatives, limiting marketing of SSB, decreasing the relative cost of healthier beverages, including screening and counseling about SSB consumption as part of a routine medical care, and expanding the knowledge and skills of medical providers to conduct nutrition screening regarding SSB consumption (CDC, 2000). Additionally, other intervention strategies to consider include: constructs of health literacy, specifically nutrition numeracy and media literacy, interactive voice response (IVR) and small groups. IVR has been shown to be an effective intervention delivery component (Oake, Jennings Van Walraven, Forster, 2009; Estabrooks, Smith-Ray, 2008; Piette, 2000; Estabrooks, Shoup, Gattshall, Dandamudi, Shetterly, Xu, 2009; Piette, McPhee, Weinberger, Mah, Kraemer, 1999). IVR is a programmed telephone call that has the capability of reaching community members with limited access. Results have shown IVR to be a reputable component in weight loss interventions, both through adults and children (Estabrooks, Smith-Ray, 2008; Estabrooks et al., 2009). Participants receiving IVR lost an average of 2.6% of their initial weight compared to the control group that lost 1.6% (Estabrooks, Smith-Ray, 2008). Estabrooks has concluded that “IVR has a relative advantage over a standard of care” (Estabrooks et al., 2009). As evidenced by Piette (2000), IVR has also been used as a delivery component in patients with cancer, heart failure, diabetes, and depression, while also demonstrating feasibility, validity, and reliability throughout these studies. Moreover, IVR has the potential to reach participants who may otherwise be inaccessible. This evidence demonstrates that IVR can be a successful intervention delivery component.

Small group sessions are another intervention delivery strategy that may help individuals decrease SSB intake. Research has documented improved results with individuals receiving education through small group sessions. There is a body of literature that supports adults learning more efficiently and effectively in a small group discussion that promotes active learning (*Gelula,1997; Cendan, Silver, Ben-David, 2011*). Small groups have been shown to “encourage individuals to participate freely and actively” and “can foster a comfortable, stimulating environment” (*US Department of Transportation*), especially in community settings where it could be culturally relevant.

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) was developed in 1991 by Icek Ajzen. Five constructs explain this theory. Attitudes, subjective norms and perceived behavioral control, all influence an individual’s intention to perform a behavior, which in turn influences the actual behavior (*Ajzen,1991*). Perceived behavioral control can directly impact behavior change. This theoretical framework describes how human behavior is influenced by three different beliefs: behavioral beliefs, normative beliefs, and control beliefs. Behavioral beliefs, the belief about the outcome of performing the behavior, determine attitudes that can be promising or unpromising. Normative beliefs, the belief about what normal expectations are, determine subjective norms. Lastly, control beliefs, the belief about aspects that may ease or hinder the behavior, determine perceived behavioral control. Moreover, programs that use a theory-based approach when developing interventions have been shown to be more effective (*Belanger-Gravel, 2011*).

Conclusions

To date, there has only been one cross-sectional study examining SSB consumption and health literacy status (*Zoellner et al., 2011*). Despite these two public health concerns, there is limited research investigating how to effectively decrease SSB intake in adults. Future research needs to develop, implement, and execute theory-based interventions that are driven in health literacy constructs. Intervention development focused on nutrition numeracy, media literacy, and potential barriers and strategies to reducing SSB, are important concepts to incorporate into future studies.

CHAPTER 2

Pilot Findings from a Randomized Controlled Trial Targeting Sugar-Sweetened Beverage Behaviors

Introduction

Low health literacy and SSB consumption are two broad public health concerns facing the United States. For example, it is estimated that 90 million Americans have insufficient literacy skills (*IOMC, 2004*) and low health literacy is associated with poorer health outcomes (*Berkman et al., 2011*). Furthermore, SSB contribute about 80% of added sugars in the diet (*Nielsen et al., 2004*) and have been associated with poor health outcomes, including obesity, type II diabetes, bone fractures, dental caries, and coronary heart disease. Despite these findings, there is limited research related to how to effectively decrease SSB intake among adults. Additionally, there have been few studies investigating health literacy interventions that target health behaviors in community settings (*Allen et al., 2011*).

The goal of this 5-week, 2-arm RCT was to pilot test the effects of an intervention to decrease SSB (SipSmartER), as compared to a matched-contact control condition targeting physical activity (Move More). The SipSmartER intervention was guided by the TPB and constructs of health literacy. The primary aims of this pilot project were to evaluate participant's feedback through process and summative evaluation as well as evaluate intervention content and/or delivery through process evaluation by staff tracking for quality improvements. Secondary aims included the assessment of changes in theorized mediating variables and health behaviors among participants.

Pilot testing the content and program delivery assisted in the further refinement and execution of a larger scale trial. Although the small sample of this pilot study limits statistical power, our hypotheses included: 1) the SipSmartER group will have significant improvement in TPB mediators related to SSB, as compared to the control condition, and 2) the SipSmartER group will have significant improvement in SSB intake, as compared to the control condition.

Methods

Study Design

This study was approved by the Institutional Review Board (IRB) at Virginia Tech (see appendix 1). Informed consent was obtained prior to completing enrollment assessment and prior to participants beginning the program (see appendix 2).

The goal of this research project was to pilot test a 5-week, 2-arm RCT testing the effects of an intervention on decreasing SSB consumption, as compared to a control condition. The SipSmartER intervention group and the Move More control group both participated in two, small group sessions at weeks 1 and 5 and also participated in three telephone calls at weeks 2, 3 and 4. Small group sessions and telephone calls were guided by the TPB and constructs of health literacy.

The learning objectives of SipSmartER class #1 were to: 1) know sugary drinks and healthier options, 2) recognize health risks related to drinking too much sugar, 3) develop a plan to reduce your sugary drink intake, if you choose to do so, and 4) discuss strategies to meet your sugary drink plan. Learning objectives for SipSmartER class #2 were to: 1) recognize personal ability to not consume SSB, 2) recognize

misclaims in SSB ads, 3) determine what is the truth/reality in SSB ads, and 4) interpret ads and compare against the nutrition label.

Learning objectives for Move More class #1 were to: 1) understand current recommendations and benefits of being physically activity, 2) learn and practice cardiovascular exercise and strength training, 3) understand rate of perceived exertion, and 4) complete a personal action plan and set goals for minutes of cardio activity per week, and minutes of strength training activity per week. Learning objectives for Move More class #2 were to: 1) explore personal motivations and strategies to overcome barriers, 2) learn how media messaging influences physical activity, 3) practice detecting hidden messages in media about physical activity, 4) practice a new cardio activity and strength training exercises with the group, and 5) set new goals on personal action plan for cardio minutes and strength training minutes.

Learning objectives for all three phone calls were as follows: Call 1) reporting behaviors and evaluating progress towards goal, Call 2) Call 1 + re-evaluating barriers and strategies, and Call 3) Call 1 + Call 2 + receiving a support message about media literacy. Each small group session and telephone call lasted approximately 90 minutes and 5-10 minutes, respectively. Participants were given \$25 for baseline enrollment and \$50 for the follow-up assessment.

Recruitment, Screening and Eligibility

Participants were recruited via flyers and word of mouth from a community center and a health care center, both located in Roanoke, Virginia (see appendix 3). Eligibility criteria consisted of participants being 18 years of age or older, English-speaking,

consuming greater than 200 calories per day of SSB and being without medical conditions for which physical activity would be contraindicated. Participants were screened either in person or over the phone. As illustrated in appendix 4, the screening questionnaire included five questions asking how often and how much different types of beverages were consumed (*Hedrick et al., 2010*), one question assessing physical activity (*Kiernan, 2011*) three questions concerning health literacy status (*Chew et al., 2008*), six questions asking about conditions that would contraindicate physical activity, and nine demographic questions. After completing the screening questionnaire researchers determined eligibility criteria and participants were contacted in person or via telephone to participate in the program.

A total of 63 individuals expressed interest and were screened (see table 2). Of those 63 screened, 42 were eligible and 21 were not eligible due to drinking fewer than 200 kcals/day of SSB (n=20) and/or being from the same household (n=1). Of the 42 eligible, 4 declined due to time constraints, 4 did not schedule a baseline appointment, and 9 did not show for the baseline appointment. In total, 25 participants completed the baseline assessment and were randomized to either SipSmartER (n=14) or Move More (n=11) to begin the program. The reach of this study was 60% of eligible participants.

Data Collection and Measures

Data collection occurred at two time points, baseline and completion of the program. At each data collection, assessments took approximately 45-60 minutes and included a computer audio-assisted questionnaire (appendix 5) and an in-person assessment (appendix 6). Computer audio-assisted questionnaire was obtained using

previously validated instruments, which included: 1) The Beverage Intake Questionnaire (BevQ), a valid and reliable 16 question instrument measuring how much and how often SSBs were consumed (*Hedrick et al., 2010*), 2) Stanford Leisure-Time Activity Categorical Item (L-CAT), a 6-item physical activity assessment in which participants chose one of six statements, ranging from inactive to very active, that best described their physical activity level in the past month (*Kiernan, 2011*), 3) Theory of Planned Behavior constructs addressing SSB and physical activity, which examined instrumental and affective attitudes, subjective norms, perceived behavioral control, behavioral intentions and implementation intentions related to SSB and physical activity (*Rhodes, 2004, Zoellner, 2011*), 4) Media Literacy, a 19-item instrument asking about media and ads as it relates to sugary drinks (*Primack, 2009*), 5) Subjective Numeracy, a 8-item self-report questionnaire measuring a person's perceived capability regarding numerical information (*Fagerlin 2007, Zikmund-Fisher 2007*), and 6) Quality of life, a 4-item assessment asking about general health, physical health, and mental health (*CDC, 2000*). Assessments completed in-person included: height, weight, blood pressure and Newest Vital Sign, a screening measurement that detects participant's health literacy status (*Weiss, 2005*).

Process and Summative Evaluation

At the end of each group session, participants completed a self-administered questionnaire (appendix 7) assessing the delivery and implementation of the small group session. Seven questions on a 5-point likert scale asked about intervention organization, flow, effectiveness, engagement, entertainment, and fun. Three additional

questions asked about their favorite part of the group session, any suggestions they would have for changes to the program and any other comments about the group session. At program completion, participants completed a qualitative summative evaluation assessment (appendix 8) asking about group sessions, telephone calls, personal action plans, and diaries. This information will allow our research team to further develop and refine intervention content and/or delivery to implement the larger scale trial.

Data Analysis

SPSS, version 20, was used for all quantitative analyses. Standardized coding protocol was used to score all validated instruments. Frequencies, means, standard deviations and chi-squared were used to summarize all quantitative measures. ANOVA tests were used to analyze group effects and group by time effects. Regression models were used to explain variance. Lastly, process and summative evaluations were measured by participant evaluation forms and intervention tracking forms.

Results

Participants

Of the total enrolled participants (n=25), 19 (76%) were female and 6 (24%) were male, suggesting that men were underrepresented. Participant's ages ranged from 18 to 68 years with a mean of 42 ± 14 years. Thirteen (52%) participants were Caucasian, 12 (48%) were African American, and 2 (8%) were considered other. It is important to note that participants could report multiple race categories. We also wanted to look at the representativeness of our population, when compared to the county and city of

Roanoke, VA. In 2010, county residents consisted of 90.0% Caucasian and 5.0% African American, while city residents consisted of 64.2% Caucasian and 28.5% African American. Our proportion of African Americans is somewhat higher when compared to the county and city of Roanoke. Likewise, our proportion of participants who did not obtain a high school education (20%) is greater than city and county data of Roanoke, at 19.1% and 10.3% respectively, as well as participants who obtained a college education (12%) is lower than city and county data for Roanoke, VA at 21.9% and 32.6% respectively. Income status showed that 8 (32%) participants had <\$5,000, 8 (32%) had \$5,000-\$14,999, 5 (20%) had \$15,000-\$25,000, 3 (12%) had >\$25,000, and 1 (4%) participant did not answer. Median household income in the City of Roanoke is \$36,422, while Roanoke County has a greater median household income of \$59,446 (US Census Bureau, 2010). Work status indicated that 13 (52%) participants were employed, 7 (28%) were unemployed, and 5 (20%) participants were considered other (i.e. homemaker, student, retired, or unable to work).

Table 1 illustrates the demographic variables that were measured, which include: gender, race/ethnicity, marital status, education level, income status, work status, and children in the home under 18 years of age. Chi-squared test revealed no significant differences between SipSmartER and Move More for gender, race/ethnicity, marital status, income status, and children in the home less than 18 years of age between the two groups, but did show a statistically significant difference ($p < .15$) in education level ($p = .017$) and work status ($p = .066$).

As exemplified in **Table 2**, eligible participants who were not enrolled (n=17, 40%), chi-squared tests indicated that a trend was present for children in the home under 18 years of age ($p=.071$), while other demographics did not vary significantly.

Attendance

As illustrated in **Table 3**, of the participants randomized to SipSmartER (n=14), 11 (78.6%) were present at the first and second small group session (mean sessions attended = 1.57 ± 0.76). Phone call completion for SipSmartER ranged from 71.4% - 85.7% (mean number of calls completed = 2.36 ± 1.2). Of the participants randomized to Move More (n=11), 9 (81.8%) were present at the first small group session and 8 (72.7%) attended the second small group session (mean = $1.55 \pm .82$). Phone call completion for Move More ranged from 81.8% - 100% (mean = $2.73 \pm .65$). ANOVA tests showed no significant differences in small group sessions and telephone calls between groups. At the end of the program, 20 participants (11 SipSmartER and 9 Move More) were present at the follow-up assessment.

Pre and Post Outcomes

Table 4 illustrates pre and post outcomes between SipSmartER and Move More participants. Behavioral outcomes included SSB calories (kcal), SSB ounces, and PA category. SSB kcal and SSB ounces were reduced in SipSmartER participants (-256.9 ± 622.6 kcal, -20.1 ± 49.2 ounces) as well as in Move More participants (-199.7 ± 404.6 kcal, -16.5 ± 31.1 ounces), yet there were no group by time differences. Move More participants also increased their PA category by 0.4 ± 0.7 .

Theory of Planned Behavior outcomes included all constructs (i.e. attitudes, subjective norms, perceived behavioral control, and behavioral intention) plus implementation intentions. Between group effects discovered significant overall effects between SSB attitudes ($p=0.001$), SSB affective attitudes ($p=0.01$), SSB instrumental attitudes ($p=0.01$), SSB total intentions ($p=0.10$), SSB intentions ($p=0.08$), SSB motivation intentions ($p=0.01$) and SSB implementation intentions ($p=0.001$). Results also indicated that dropping one subjective numeracy question improved alpha from 0.533 to 0.837. This model was further used to determine regression models. ANOVA tests also revealed significant between group effects ($p=0.07$) with SSB implementation intentions. When examining physical activity TPB constructs, subjective norms was the only construct to show significance between group effects ($p=0.02$).

Health literacy outcomes included media literacy, subjective numeracy, and newest vital sign. Media literacy constructs, as well as the newest vital sign showed significant overall effects of $p=0.00$ and $p=0.10$ respectively. Further analysis of health literacy status indicated that 6 (24%) participants had a high likelihood of limited literacy skills (0-1 correct answers), 7 (28%) had a possibility of limited literacy skills (2-3 correct answers), and 11 (44%) had adequate literacy skills (4-6 correct answers). Lastly, weight and blood pressure outcomes were measured. Systolic blood pressure was the only outcome that showed significance ($p=0.04$) between group effects.

Table 5 illustrates the TPB to predict SSB and physical activity behaviors among all participants. Attitudes included a 4-item (total attitudes) and 2-item (affective attitudes and instrumental attitudes) construct. Subjective norms included a 3-item (total subjective norms) and a 2-item (without Q3) construct. Perceived behavioral control

included 3-items. Intention included a 4-item (total intention) and a 2-item (intention and motivation) construct. Implementations intentions were added to the TPB to see if any changes in predicting behavior were noticeable. Regression models were analyzed with and without implementations intentions. Hypotheses included those standard coefficients for the TPB constructs in the models of SSB should be negative, because as TPB constructs increase, SSB should decrease. On the contrary, standard coefficients for the TPB constructs in the models of physical activity should be positive, because as TPB constructs increase, PA should also increase.

Regression Models

Model 1 shows the most significant predictor of SSB behavior ($R^2 = 0.592$, $F = 2.485$, $p = 0.080$). Using a step-by-step procedure, constructs were examined starting with implementation intentions (step 1), behavioral intentions (step 2), perceived behavioral control (step 3), and lastly subjective norms and attitudes were combined (step 4). Variance increased from 0.013 (step 1) to 0.592 (step 4). Results indicated that standard coefficients were negative in behavioral motivation intentions (-0.615) and affective attitudes (-0.684), while affective attitudes showed the most significant standard coefficient ($p = 0.008$).

Model 2 shows the most significant predictor of physical activity behavior ($R^2 = 0.621$, $F = 2.813$, $p = 0.056$). Variance increased from 0.002 (step 1) to 0.621 (step 4). Results indicated that standard coefficients were positive in implementation intentions (0.123), behavioral motivation intentions (0.527) and instrumental attitudes (-0.684), while instrumental attitudes showed the most significant standard coefficient ($p = 0.002$).

Additional regression and correlation models were examined and can be found in appendices 9, 10, 11.

Process Evaluation

Table 6a illustrates participant feedback about each small group session. Ten participants included feedback for SipSmarter class 1 and 8 participants for class 2. Nine participants included feedback for Move More class 1 and 10 participants for class #2. On a scale of 0 (strongly disagree) to 5 (strongly agree) participant's mean scores ranged from 4.2-5.0. SipSmartER participants had higher mean scores overall when compared to Move More participants. Mean scores of 5.0 were present for only SipSmartER participants when asked about the organization of the session for class 2 and the presenter's knowledge of the subject in class 1. Mean scores did not show drastic changes between class 1 and class 2.

Table 6b illustrates staff feedback about each small group session. Four staff members included feedback for SipSmarter class 1 and 7 staff members for class 2. Eleven staff members included feedback for Move More class 1 and 7 staff members for class 2. On a scale of 0 (strongly disagree) to 5 (strongly agree) staff members' mean scores also ranged from 4.2-5.0. Mean scores of 5.0 were present for both SipSmartER class 1 and 2, when assessing content organization and flow, engaging and effective activities, and accurate scientific content.

SipSmartER Participant Feedback

The majority of SipSmartER participants concluded that their favorite parts about class 1 was realizing how much sugar is found in beverages, the health risks associated

with drinking too much sugar, realizing how much sugar they were consuming and learning about better alternatives. Participants concluded that hands on activities (i.e. learning about serving sizes, whipped cream demonstration, and counting sugar packets) were fun and engaging. Overall, participants thought class 1 was “very beneficial,” “informative” and “fun,” and couldn’t wait until the next class to learn more. Suggestions that were noted included bringing speakers for the laptops and asking if participants had any questions that could be answered in the next small group.

SipSmartER participants concluded that class 2 was “captivating,” “very informative,” “time well spent,” and had only a few suggestions for any changes (i.e. increase time of session and encourage more conversation among participants). Themes that emerged when asking participants about important things that were learned included media’s role and influence with SSB companies and how advertisements leave out important information pertaining to the health risks associated with drinking too many SSBs.

When asked about the personal action plan, overall themes that emerged were that it encouraged responsibility and accountability, offered ideas about strategies to overcome barriers, and helped make goals achievable. The only dislikes that were mentioned about using the personal action plan included the time it took to complete it and realizing the amount of sugar consumed.

When asked about likes and dislikes about goal setting, participants concluded that having something to visualize was helpful. While some participants stated that they enjoyed the challenge of setting goals and achieving them, other participants stated the challenging aspect as a dislike.

When asked about opinions with participant's drink diaries, the major positive theme that emerged included the accountability with tracking the amount of sugary drinks throughout the day. Most participants stated that they disliked the amount of time that it took them to record and it was hard to remember to keep the diary with them throughout the day. Most participants expressed ease when asked if it was easy or hard to figure out SSB weekly averages, but a few participants did express difficulties, saying "It was hard to look through each day and each time per day." When analyzing participant comments, one participant stated that it was easy to determine an average, "All you have to do is add them up and multiply by the days." This reinforces that even when asking participants about numerical information, participants may be unaware of how to calculate numbers, in this case determine a weekly average.

When asked about the telephone calls, SipSmartER participants concluded that they were "supportive," "kept me motivated," and "made it fun." Dislikes that emerged included the timing of the calls with one participant stating "It was hard to get calls at work or when I was driving." Participants did not express dislikes with having to report their SSB intake over the phone with one participant stating "It was nice to speak with someone and set another goal." When asked about strategies offered over the phone, positive themes that emerged including one participant stating, "They were helpful, gave me new ideas, and nothing that I had thought about before." Only one participant stated that they were not helpful, because they did not have any barriers.

When asked about anything else that could improve the program, one participant suggested that the phone calls be less scripted, another participant stated having a mentor to call if a participant was struggling with setting their goals would be beneficial

and lastly, one participant suggested randomizing a different way, stating “My sugar intake was already low, drawing a number was questionable, and I could have benefitted from the physical activity class.”

Move More Participant Feedback

The majority of Move More participants concluded that their favorite part about class 1 was being able to exercise. Participants expressed interest with the exercise bands and cardio DVD, with one participant concluding “I likes learning different ways to work my arms and upper body with the resistance band.” Suggestions included providing fruit to eat during the group session and having a longer session of physical activity, with one participant stating “I would like an extra 15 minutes to talk with other people in the group.” Participants concluded that “good info,” was provided and that the research was “interesting.” Themes that emerged when asking about the most important things learned from class 1 included, understanding exercise and how important exercise is for health, learning about different ways to exercise, and learning the recommended guidelines for 150 minutes/week.

Move More participants stated that favorite parts of class 2 included “group discussions,” “commercials,” “Walking DVD,” and stated that the presenter was “very entertaining.” Participants stated that the class was “very well organized,” and “professionally presented,” and had only one suggestion of a longer class time (i.e. 2 hours, instead of 1 hour and 30 minutes).

When asked about developing the personal action plan, one main positive theme that emerged included participants liking the challenge of setting a goal, with one

participant stating “It helped me increased my physical activity, I moved from doing 30 minutes per day to doing 45 minutes per day.”

When asked about opinions of completing physical activity diaries, the majority of Move More participants concluded that they enjoyed keeping track of their exercise each day. One participant concluded, “It was good, being able to look back and see what I’ve done, where I was, and where I am now.” The majority of participants also concluded ease of use with the dairy.

When asked about the telephone calls at Weeks 2, 3, and 4, participants stated that it held them “accountable” and was a “good reminder.” One participant stated, “It kept me on track!” Dislikes about the phone calls included that they sounded “too scripted” and the TPB questions at the end of the calls were too repetitive. Participants also suggested setting up a time to call each week would be helpful.

When asked about the DVDs that were provided, many participants that did use it stated that they only used it once, with most participants stating that they didn’t use it. One participant expressed interest in the DVD offered in class 2, stating that “it was easier.”

When asked about the exercise bands that were provided, a majority of participants expressed interest, with on participant saying, “It was very useful as far as strength training. It didn’t take up any space and you could carry it with you if you wanted. It was accessible.”

When asked about anything else that could improve the program, suggestions included having the class in a gym-like setting instead of a conference room, offering a

gym membership instead of a Wal-Mart gift card, and extend the class time by 30 minutes to allow 10 minutes for class room discussion and 20 minutes to exercise more.

Staff Feedback

Staff members concluded that the Sugary Drink game, sugar packet demonstration, and taste-test were considered favorite activities in SipSmartER class 1. The “parking lot,” as well as demonstrating the red/yellow/green light drinks was very effective. Suggestions that were noted included: getting sticky poster board sheets, keeping track of the individuals who were taking more time doing the action plan/better explanation of filling out action plan, getting a can of red-bull for demonstrations, adding images to the PowerPoint (i.e. G2, 8-ounce can of soda, slimfast, 5-hour energy, and coffee creamer), encourage participants to try using the blue cup at home for 1-2 days to help them record in their drink diary, improve video quality, get speakers for computer, and put packets of sugar into perspective with food. Staff members concluded that this presentation increased participant’s knowledge of health risks, debunked artificial sweeteners myth, and informed participants about cost-savings, while also increasing participant motivation by presenting the health risks and the amount of sugar found in SSB.

Staff members identified the jingle, picture, and slogan activities as their favorites of SipSmartER class 2. One staff member stated “All the activities were great with good take away messages.” Suggestions that were noted included: re-cap of the health risks and recommendations stated in the 1st group session, better explanation of the media wheel, adding a billboard image to the “What is Media” slide, addressing cost in depth, working on the length of the class session, getting speakers for the computer, and

incorporating one more activity using the popsicle sticks. Staff members concluded that participant's knowledge was increased from reinforcing what participants learned from class #1 and by empowering participants to not become products for sugary drink companies. Lastly, staff concluded that participant's motivation was increased by learning how to outsmart the media.

Staff members identified participants as being "engaged and excited" about Move More class 1. Staff members noted that the action plan worked well being introduced throughout the class, instead of at the end, and agreed that the barrier section should be moved to the beginning. Suggestions included: adding more time for participant conversation, emphasizing "why" we need to be more active, adding a "parking lot" as in the SSB group, reviewing the recommended guidelines in more depth, change the minutes to hours on the informed consent (i.e. 90 minutes to 1 hour and 30 minutes) and finalize the action plan (adding color, making sections more defined, headings should be bold and bigger).

Staff members stated that the handouts, exercise in class, and DVD was beneficial for Move More class 2. Suggestions included: playing a commercial ad to analyze as a group, use the teachback method for the exercises, get speakers for the computer, answer media questions as a group to foster group interaction and lastly, increase the time to 2 hours.

Discussion

The primary aims of this pilot project were to evaluate participant's feedback through process and summative evaluation as well as evaluate intervention content and/or delivery through process evaluation by staff tracking for quality improvements. In

our study, overall participant and staff feedback were very positive, both ranging from 4.2-5.0 on a 5-point likert scale that included questions about intervention organization, flow, effectiveness, engagement, entertainment, and enjoyment. It has been well documented that utilizing process evaluation for interventions provides researchers with a better understanding of program components (*Linnan, 2002*). Moreover, Berkman and colleagues have found that interventions that have been piloted tested have resulted in greater effects (*Berkman, 2011*). This process evaluation has provided our research team with feedback about study design and implementation for the larger trial launching in Spring 2012.

Qualitative findings have suggested five key points to consider for the larger trial, 1) earlier integration of the personal action plan, 2) having the first IVR call to be live to incorporate the teachback method to ensure participants have a clear understanding on how to interpret servings sizes, calculate weekly averages of beverages and physical activity, etc. 3) timing and refinement of key content delivery (i.e. changing small group session to 2 hours, instead of 1 hour and 30 min), 4) refinement of recruitment protocol (i.e. expanding recruitment to non-primary healthcare clinics), and 5) including non-SSB counterparts (i.e. tea with artificial sweeteners, diet alternatives) during screening process.

Our secondary aim included the assessment of changes in theorized mediating variables and health behaviors among participants. Although SSB consumption decreased more among the SipSmartER participants, there were no significant group differences. However, among all participants, changes in the TPB constructs significantly predicted changes in SSB ($R^2=0.592$; $F=2.485$; $p=0.080$) and physical

activity ($R^2=0.621$; $F=2.813$; $p=0.056$) behaviors. The variability (59% & 62%) that is described by these models indicate that attitudes, subjective norms, perceived behavioral control, and behavioral intentions provide a strong explanation on behavior change. Godin and colleagues (1996) modeled the TPB on eating behaviors and concluded that R^2 of 0.49 and 0.59 was significant. Our findings suggest promise for understanding behavioral determinants associated with drinking SSB.

It has been well documented that consumption of SSB is on the rise and that increased SSB intake is correlated to many health risks. Despite these concerns, there is limited research investigating how to effectively decrease SSB in adults. Only three known behavioral experimental studies examining SSB intake in adults have been documented (*Stookey, Constant, Gardner, Popkin, 2007; Chen et al., 2009, Tate 2011*). All three studies concluded that reducing SSB consumption is achievable and can have a positive impact on one's health, but not one of these studies used a theory-based approach or utilized constructs of health literacy. As evidenced by Allen and colleagues (2011), to date, there are limited studies investigating longitudinal changes in health literacy interventions. This can be attributed to health literacy status being viewed as a controversial issue (*Berkman, 2006*). Some scholars believe health literacy status to be static, while other scholars believe that health literacy can be improved through extensive interventions (*Berkman, 2006*). Furthermore, studies have shown positive results in improving health literacy status among individuals (*Nitiri & Stewart, 2009; van Servellen et al., 2003; van Servellen et al., 2005*). Similar to our study, more are needed to explore if health literacy can be improved. This information further represents the need that research efforts should focus on theory-based interventions driven in health

literacy constructs to directly understand causal links between attitudes, subjective norms and perceived behavioral control for health behaviors, specifically SSB intake.

To our knowledge, this is the first community-based intervention targeting SSB and physical activity behaviors, using TPB and health literacy constructs. Having identified that low health literacy and SSB consumption are two major public health concerns and that both have been shown to be related to poorer health outcomes (*Nielsen, 2004; Berkman, 2011*), to date, there is little emphasis on community-based interventions targeting these concerns.

Limitations of the study included no major differences in behavioral outcomes for SipSmartER and Move More, which may have been attributed to a small sample size, a short intervention duration (5 weeks), and each group being exposed to SSB and physical activity recommendations.

In conclusion, overall data suggests promise for the piloted intervention to improve SSB consumption through targeted TPB and health literacy strategies. This pilot study has allowed for further refinement and execution of a larger scale trial that includes a larger sample and longer study duration (i.e. 6-months) and follow-up period (i.e. 18-months). Future research needs to develop, implement, and execute theory based interventions that are driven in health literacy constructs. These findings suggest that intervention development focused on nutrition numeracy, media literacy, and potential barriers and strategies to reducing SSB, are essential to explain further associations with SSB consumption.

Table 1: Demographic Characteristics of Enrolled Participants at Baseline (n=25)

	Group 1: SipSmartER (n=14)	Group 2: Move More (n=11)	
	Count (%)	Count (%)	p-value ^a
Gender			
Female	12 (85.7 %)	7 (63.6%)	.350
Male	2 (14.3%)	4 (36.4%)	
Race/Ethnicity			
White	9 (64.3%)	4 (36.4%)	N/A
African American	5 (35.7%)	7 (63.6%)	
Other	2 (14.2%)	-	
Marital Status			
Married	3 (21.4%)	-	.082
Divorced	5 (35.7%)	1 (9.1%)	
Widowed	-	1 (9.1%)	
Separated	1 (7.1%)	-	
Never Married	5 (35.7%)	7 (63.6%)	
Member of an Unmarried Couple	-	2 (18.2%)	
Education Level			
≤ High School	2 (14.3%)	7 (63.6%)	.017
> High School	12 (85.7%)	4 (36.4%)	
Income Status			
< \$5,000	4 (28.6%)	4 (36.4%)	.589
\$5,000- 14,999	6 (42.9%)	2 (18.2%)	
15,000-25,000	2 (14.3%)	3 (27.3%)	
> \$25,000	2 (14.3%)	1 (9.1%)	
Did not answer	-	1 (9.1%)	
Work Status			
Employed	10 (71.4%)	3 (27.3%)	.066
Unemployed	3 (21.4%)	4 (36.4%)	
Other (Homemaker, Student, Retired, Unable to work)	1 (7.1%)	4 (36.4%)	
Children in the home under 18 years of age			
0	7 (50%)	4 (36.4%)	.793
1	5 (35.7%)	5 (45.5%)	
2 or more	2 (14.3%)	2 (18.2%)	

^a Chi-squared tests

N/A: Chi-squared not available, participants could select all that apply.

Table 2: Examining Reach of Enrolled vs. Not Enrolled Participants (n = 42)

	Enrolled (n = 25)	Not Enrolled (n = 17)	
	Count (%)	Count (%)	p-value ^a
Gender			
Female	19 (76.0%)	12 (70.6%)	.733
Male	6 (24.0%)	5 (29.4%)	
Race/Ethnicity			
White	13 (52.0%)	9 (52.9%)	N/A
African American	12 (48.0%)	7 (41.2%)	
Other	2 (8.0%)	2 (11.8%)	
Marital Status			
Married	3 (12.0%)	3 (17.6%)	.615
Divorced	6 (24.0%)	4 (23.5%)	
Widowed	1 (4.0%)	-	
Separated	1 (4.0%)	1 (5.9%)	
Never Married	12 (48.0%)	5 (29.4%)	
Member of an Unmarried Couple	2 (8.0%)	4 (23.5%)	
Education Level			
≤ High School	9 (36.0%)	6 (35.3%)	1.000
> High School	16 (64.0%)	11 (64.7%)	
Income Status			
< \$5,000	8 (32.0%)	4 (23.5%)	.473
\$5,000- 14,999	8 (32.0%)	3 (17.6%)	
15,000-25,000	5 (20.0%)	5 (29.4%)	
> \$25,000	3 (12.0%)	4 (23.5%)	
Did not answer	1 (4.0%)	1 (5.9%)	
Work Status			
Employed	13 (52.0%)	7 (41.2%)	.143
Unemployed	7 (28.0%)	2 (11.8%)	
Other (Homemaker, Student, Retired, Unable to work)	5 (20%)	8 (47.1%)	
Children in the home under 18 years of age			
0	11 (44.0%)	8 (47.1%)	.071
1	10 (40.0%)	2 (11.8%)	
2 or more	4 (16.0%)	7 (41.2%)	

^a Chi-squared tests

N/A: Chi-squared not available, participants could select all that apply.

Table 3: CONSORT Diagram

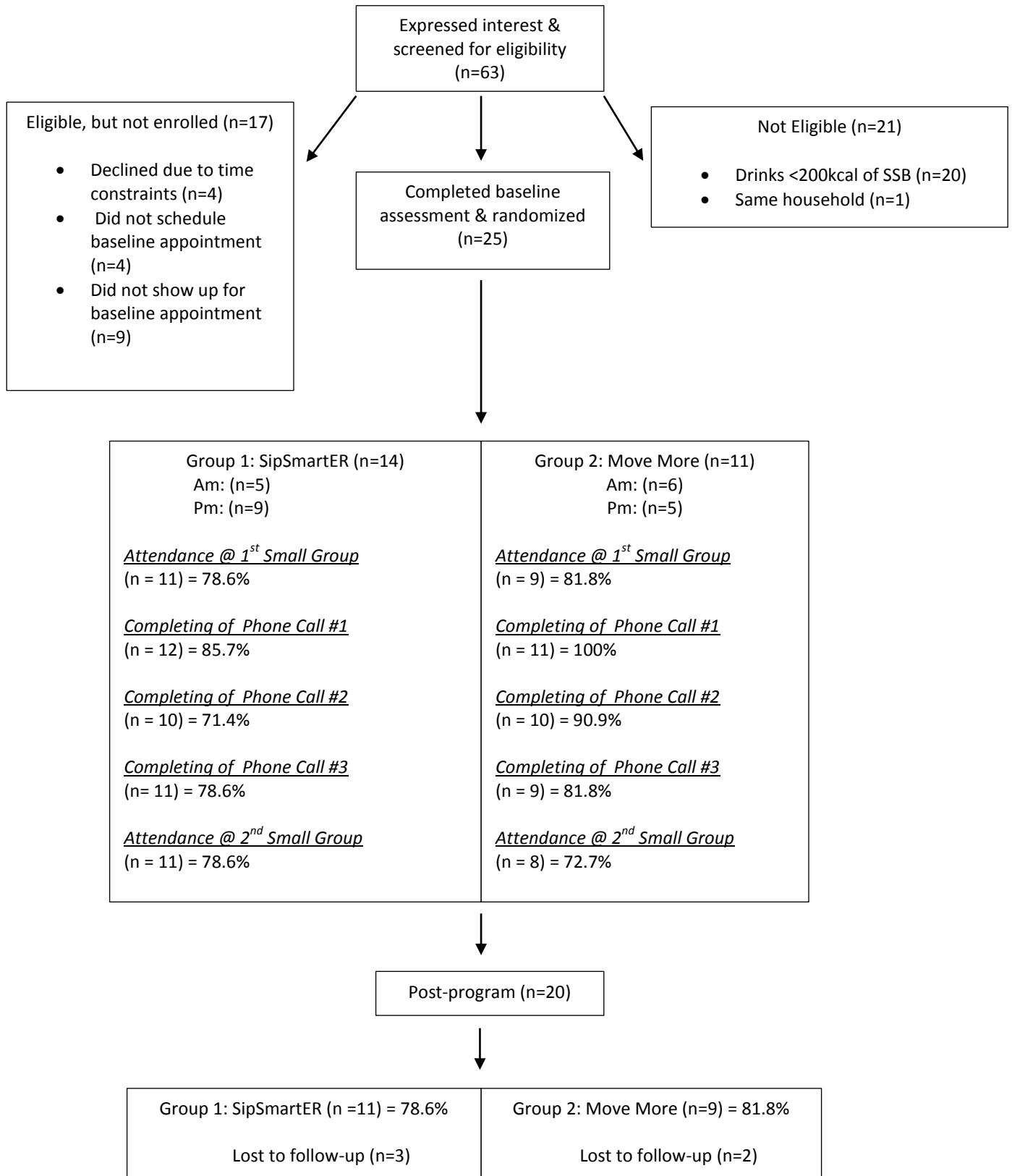


Table 4: Pre and Post Outcomes between SipSmartER and Move More

		SipSmartER Mean (SD) (n = 11)		Move More Mean (SD) (n = 9)		Overall Effects	Between Group Effects
Behavioral Outcomes							
		Pre	Post	Pre	Post		
SSB kcals		537.5 (633.3)	280.6 (261.4)	574.8 (389.3)	375.1 (251.573)	F = 3.58 P = .08	F = .06 P = .82
SSB ounces		44.1 (49.4)	24.1 (21.7)	49.6 (30.0)	33.2 (22.7)	F = 3.72 P = .07	F = .04 P = .85
PA category		2.4 (1.0)	2.5 (1.3)	2.6 (1.2)	3.0 (1.0)	F = 1.21 P = .29	F = .53 P = .48
Theory of Planned Behavior Outcomes							
SSB	Chronbach alpha's (Baseline)						
SSB Attitudes (6 items)	.534	3.9 (1.0)	5.1 (1.1)	4.5 (0.5)	5.3 (0.6)	F = 31.35 P = 0.001	F = .64 P = 0.433
SSB Affective Attitudes only (3 items)	.716	3.4 (1.5)	4.4 (1.5)	3.4 (1.3)	4.6 (1.0)	F = 9.57 P = 0.01	F = 1.0 P = 0.76
SSB Instrumental Attitudes only (3 items)	.797	4.6 (1.5)	5.8 (1.5)	5.6 (1.0)	6.1 (0.8)	F = 10.51 P = .01	F = 1.95 P = .180
SSB SN (3 items)	.533	5.0 (1.5)	5.5 (1.1)	5.3 (1.1)	5.6 (1.2)	F = 1.4 P = .25	F = .06 P = .80
SSB SN (2 items-drop Q3)	.837	5.5 (1.8)	5.8 (1.5)	5.8 (1.3)	6.1 (1.1)	F = .38 P = .55	F = .00 P = .97
SSB PBC (3 items)	.730	5.4 (1.4)	5.6 (1.3)	4.9 (1.7)	5.4 (2.0)	F = .51 P = .49	F = .09 P = .77
Behavioral Intention Total (4 items)	.881	4.9 (1.6)	5.5 (1.5)	4.9 (0.8)	5.6 (1.1)	F = 7.04 P = .10	F = .02 P = .76
Behavioral Intention Only (2 items)	.719	4.4 (1.8)	5.1 (1.9)	4.7 (1.3)	5.3 (1.7)	F = 3.46 P = .08	F = .03 P = .87

Behavioral Motivation Only (2 items)	.919	5.45 (1.619)	5.86 (1.267)	5.00 (.750)	5.83 (1.118)	F = 8.65 P = .01	F = 1.1 P = .33
Implementation Intentions (4 items)	.893	5.25 (1.778)	5.89 (1.306)	4.53 (1.711)	6.39 (.502)	F = 15.8 P = .001	F = 3.80 P = .07
Physical Activity							
PA Attitudes (6 items)	.928	5.32 (1.667)	5.11 (1.407)	5.70 (.807)	5.96 (.904)	F = .02 P = .90	F = 1.54 P = .23
PA Affective Attitudes Only (3 items)	.919	5.03 (1.690)	4.64 (1.402)	5.04 (1.513)	5.15 (1.842)	F = .31 P = .58	F = 1.00 P = .33
PA Instrumental Attitudes Only (3 items)	.975	5.61 (1.712)	5.58 (1.694)	6.37 (.588)	6.78 (.236)	F = 1.3 P = .27	F = 1.74 P = .20
PA SN (3 items)	.275	5.64 (1.159)	5.24 (1.383)	5.33 (1.155)	5.96 (1.195)	F = .37 P = .55	F = 6.97 P = .02
PA SN (2 items- drop Q3)	.614	5.68 (1.736)	5.32 (1.677)	5.94 (.917)	6.11 (1.244)	F = .23 P = .64	F = 1.67 P = .21
PA PBC (3 items)	.827	5.24 (1.758)	5.61 (1.272)	5.85 (1.094)	5.44 (1.986)	F = .01 P = .94	F = 1.61 P = .22
Behavioral Intention Total (4 items)	.949	4.48 (1.429)	4.27 (1.859)	5.03 (1.725)	5.06 (1.849)	F = .09 P = .77	F = .15 P = .71
Behavioral Intention (2 items)	.797	4.14 (1.380)	3.64 (1.989)	4.72 (1.679)	4.61 (2.043)	F = .56 P = .46	F = .23 P = .64
Behavioral Motivation (2 items)	.953	4.82 (1.537)	4.91 (1.882)	5.33 (1.785)	5.50 (1.803)	F = .25 P = .62	F = .02 P = .88
Implementation Intentions (4 items)	.922	4.91 (1.671)	5.05 (1.661)	5.42 (1.829)	5.64 (2.118)	F = .23 P = .64	F = .01 P = .91
Health Literacy Outcomes							
Media Literacy							
Media Literacy AA (5 items)	.571	3.4 (0.5)	3.7 (0.5)	3.3 (0.5)	3.4 (0.5)	F = 1182.24 P = .00	F = .64 P = .43
Media Literacy MM	.719	3.5 (0.3)	3.8 (0.3)	3.3 (0.5)	3.65 (0.3)	F = 16.06	F = .05 P = .83

(9 items)						P = .00	
Media Literacy RR (5 items)	.813	3.4 (0.6)	3.8 (0.3)	3.3 (0.7)	3.5 (0.5)	F = 1116.61 P = .00	F = .65 P = .43
Subjective Numeracy							
Subjective Numeracy Total (8 items)	.719	4.8 (1.2)	4.9 (1.3)	3.5 (1.3)	3.6 (1.6)	F = .51 P = .48	F = .01 P = .94
Subjective Numeracy Ability (4 items)	.912	4.4 (1.7)	4.3 (1.8)	2.6 (1.8)	3.3 (2.1)	F = .74 P = .40	F = 1.88 P = .187
Subjective Numeracy Preference (4 items)	.320	5.1 (1.2)	5.6 (1.6)	4.4 (1.3)	3.9 (1.2)	F = .03 P = .88	F = 3.10 P = 1.0
Newest Vital Sign							
Newest Vital Sign (6 items)	.764	3.5 (1.8)	3.7 (2.0)	2.0 (1.6)	2.8 (1.8)	F = 3.0 P = .10	F = .65 P = .43
Weight and Blood Pressure Outcomes							
Weight (kg)		90.7 (22.5)	90.3 (23.9)	92.9 (26.1)	93.5 (27.4)	F = .05 P = .69	F = .82 P = .42
SBP		123.2 (21.0)	138.7 (28.9)	117.9 (16.2)	119.3 (14.0)	F = 7.44 P = .01	F = 5.13 P = .04
DBP		73.9 (14.3)	82.1 (17.8)	72.9 (12.534)	76.8 (9.0)	F = 6.09 P = .02	F = .77 P = .39

Table 5: Using the Theory of Planned Behavior to Predict SSB and Physical Activity Behaviors among All Participants

Model 1: SSB Behaviors	R²	F	p-value model	Standard coefficient in final model	p-value standard coefficient
Step 1: Implementation Intentions	.013	.232	.636	.244	.277
Step 2: Behavioral Intentions (Intention)	.068	.386	.764	.076	.755
Step 2: Behavioral Intentions (Motivation)				-.615	.040
Step 3: Perceived Behavioral Control	.086	.353	.838	.531	.056
Step 4: Subjective Norms (2Q)	.592	2.485	.080	.196	.395
Step 4: Attitudes (Instrumental)				.160	.487
Step 4: Attitudes (Affective)				-.684	.008

Model 2: Physical Activity Behaviors	R²	F	p-value model	Standard coefficient in final model	p-value standard coefficient
Step 1: Implementation Intentions	.002	.044	.836	.123	.667
Step 2: Behavioral Intentions (Intention)	.016	.086	.967	.527	.152
Step 2: Behavioral Intentions (Motivation)				-.729	.032
Step 3: Perceived Behavioral Control	.047	.187	.942	-.018	.942
Step 4: Subjective Norms (2Q)	.621	2.813	.056	-.449	.083
Step 4: Attitudes (Instrumental)				1.235	.002
Step 4: Attitudes (Affective)				-.434	.197

Table 6a: Summative Evaluation from Participants

Questions	SipSmartER Mean (SD)		Move More Mean (SD)	
	Class #1 (n = 10)	Class #2 (n = 8)	Class #1 (n = 9)	Class #2 (n = 10)
The session was well organized.	4.9 (0.32)	5 (0)	4.5 (0.54)	4.5 (1.27)
The information was easy to understand.	4.9 (0.32)	5 (0)	4.6 (0.52)	4.5 (1.27)
The activities were fun.	4.7 (0.71)	4.9 (0.35)	4.5 (0.76)	4.4 (1.35)
The session was the right amount of time.	4.8 (0.42)	4.6 (0.74)	4.6 (0.52)	4.2 (1.32)
I learned things in the session that I did not know before.	4.5 (0.85)	4.6 (0.74)	4.6 (0.52)	4.4 (1.35)
The presenters seemed to understand my concerns.	4.9 (0.32)	4.9 (0.35)	4.4 (0.52)	4.5 (1.27)
The presenters knew what they were talking about.	5 (0)	4.9 (0.35)	4.8 (0.46)	4.5 (1.27)

Table 6b: Summative Evaluation from Staff

	SipSmartER Mean (SD)		Move More Mean (SD)	
Questions	Class #1 (n = 4)	Class #2 (n = 7)	Class #1 (n = 11)	Class #2 (n = 7)
The content was well organized and had good flow.	5 (0)	5 (0)	4.7 (0.47)	4.5 (0.55)
The overall pace of the presentation was effective.	4.7 (0.47)	5 (0)	4.7 (0.48)	4.5 (0.55)
The activities were engaging and effective.	5 (0)	5 (0)	4.9 (0.32)	4.6 (0.55)
The demonstrations/visuals were engaging and effective.	5 (0)	4.8 (0.37)	4.8 (0.41)	4.6 (0.534)
The objectives of the presentation were accomplished.	4.8 (0.43)	4.5 (0.76)	4.7 (0.48)	4.8 (0.41)
The scientific content of the presentation was accurate.	5 (0)	5 (0)	4.8 (0.44)	5 (0)
The content was appropriate for a low health literate audience.	4.8 (0.43)	4.5 (0.5)	4.7 (0.47)	4.2 (0.84)

References

- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50,179-211.
- Allen, K., Zoellner, J., Motley, M., & Estabrooks, P.A. (2011). Understanding the internal and external validity of health literacy interventions: A systematic literature review using the RE-AIM framework. *Journal of Health Communication*. 16:sup3, 55-72.
- American Medical Association. (2005). Understanding health literacy: Implications for 423 medicine and public health. *AMA press*.
- Aufderheide, P. (1993). Part II: Conference Proceedings and Next Steps. Aspen Institute Report of the National Leadership Conference on Media Literacy. Washington, D.C.: Communications and Society Program of the Aspen Institute.
- Belanger-Gravel, A., Godin G., Vezina-Im, L., Amireault S., Poirier, P. The effect of theory-based interventions on physical activity participation among overweight/obese individuals: a systematic review. *Obesity Review*. 2011 (12):430–439
- Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Viera A, Crotty K, Holland A, Brasure M, Lohr KN, Harden E, Tant E, Wallace I, Viswanathan M. Health Literacy Interventions and Outcomes: An Updated Systematic Review. Evidence Report/Technology Assessment No. 199. (Prepared by RTI International–University of North Carolina Evidence-based Practice Center under contract No. 290-2007-10056-I.) AHRQ Publication Number 11-E006. Rockville, MD. Agency for Healthcare Research and Quality. March 2011.
- Bleich, S., Wang, C., Wang, Y., Gortmaker. S. Increasing consumption of sugar-sweetened beverages among US adults: 1988–1994 to 1999–2004. *Am J Clin Nutr* 2009; 89:372-381.
- Bray GA, Nielsen SJ, Popkin BM. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. *Am J Clin Nutr*. 2004; 79(4):537-43.
- Bright, G., Corti, A., *Low-Calorie Sweeteners: Present and Future*. *World Rev Nutr Diet*. 1999, 85: 3-9
- Brownell KD, Farley T, Willett WC, Popkin BM, Chaloupka FJ, Thomason JW, Ludwig DS. The public health and economic benefits of taxing sugar-sweetened beverages. *N Engl J Med*. 2009;361:1599-1605.

- Cavanaugh K, Wallston KA, Gebretsadik T, Shintani A, Huizinga MM, Davis D, Gregory RP, Malone R, Pignone M, DeWalt DA, Elasy TA, Rothman RL. Addressing literacy and numeracy to improve diabetes care. *Diabetes Care*. 2009;32:2149-2155.
- Cavanaugh K, Huizinga MM, Wallston KA, Gebretsadik T, Shintani A, Davis D, Gregory RP, Fuchs L, Malone R, Cherrington A, Pignone M, DeWalt DA, Elasy TA, Rothman RL. Association of numeracy and diabetes control. *Ann Intern Med*. 2008;148:U737-U740.
- Cendan, JC., Silver, M., Ben-David, K. Changing the student clerkship from traditional lectures to small group case-based sessions benefits the student and the faculty. *J Surg Educ*. 2011 Mar-Apr;68(2):117-20.
- Centers for Disease Control and Prevention. Measuring Healthy Days. Atlanta, Georgia: CDC, November 2000.
- Centers for Disease Control and Prevention. The CDC Guide to Strategies for Reducing the Consumption of Sugar-Sweetened Beverages. March 2010.
- Chen LW, Appel LJ, Loria C, et al. Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial. *Am J Clin Nutr* 2009;89(5):1299-306.
- Chew, L. D., Griffin, J. M., Partin, M. R., Noorbaloochi, S., Grill, J. P., Snyder, A., et al. Validation of screening questions for limited health literacy in a large VA outpatient population. *Journal of General Internal Medicine*, 2008. 23(5), 561-566.
- Dewalt, D., Berkman, N., Sheridan S., Lohr, K., Pignone, M., Literacy and Health Outcomes: A Systematic Review of the Literature. *J Gen Intern Med*. 2004(12): 1228–1239.
- Duffey KJ, Popkin BM. Shifts in patterns and consumption of beverages between 1965 and 2002. *Obesity*. 2007;15:2739-2747.
- Erin Krzeski, Master's Thesis, Using the Theory of Planned Behavior to Understand Drink Choices in Southwest Virginians, 2011.
- Estabrooks, P. A., Shoup, J. A., Gattshall, M., Dandamudi, P., Shetterly, S., & Xu, S. (2009). Automated telephone counseling for parents of overweight children: a randomized controlled trial. *Am J Prev Med*, 36(1), 35-42.
- Estabrooks, P. A., & Smith-Ray, R. L. (2008). Piloting a behavioral intervention delivered through interactive voice response telephone messages to promote weight loss in a pre-diabetic population. *Patient Educ Couns*, 72(1), 34-41.

- Fagerlin, A., Zikmund-Fisher, B.J., Ubel, P.A., Jankovic, A., Derry, H.A., & Smith, D.M. Measuring numeracy without a math test: Development of the Subjective Numeracy Scale (SNS). *Medical Decision Making*, 2007; 27: 672-680.
- Flegal, K., Carroll, M., Ogden, C., Johnson, C. Prevalence and Trends in Obesity Among US Adults, 1999-2000 *JAMA*. 2002;288(14):1723-1727.
- Fung, T. T., Malik, V., Rexrode, K. M., Manson, J. E., Willett, W. C., Hu, F. B. (2009). Sweetened beverage consumption and risk of coronary heart disease in women. *Am J Clin Nutr*, 89, 1037-42.
- Gelula, 1997.
- Godin G, Kok G. The theory of planned behavior: a review of its applications to health-related behaviors. *Am J Health Promot*. 1996;11:87-98.
- Golbeck, A., Ahlers-Schmidt, C., Paschal, A. Health literacy and adult basic education assessments. *Interdisciplinary Journal for Adult Literacy Educational Planning*. 2005. 15:3.
- Grimm, G. C., Harnack, L., & Story, M. (2004). Factors associated with soft drink consumption in school aged children. *Journal of the American Dietetic Association*, 104, 1244-1249. Healthy People 2010. Department of Health and Human Services.
- Hedrick V, Comber D, Estabrook P, Salva J, Davy B. The beverage intake questionnaire: Determining initial validity and reliability. *J Am Diet Assoc* 2010;110(8):1227-32.
- Heller KE, Burt BA, Eklund SA. Sugared soda consumption and dental caries in the United States. *J Dent Res*. 2001 Oct;80(10):1949-53.
- Huizinga MM, Beech BM, Cavanaugh KL, Elasy TA, Rothman RL. Low numeracy skills are associated with higher BMI. *Obesity*. 2008; 16:1966-1968.
- Institute of Medicine Committee on Health Literacy. Health literacy: a prescription to end confusion. Washington DC: the National Academies Press, 2004.
- Ismail, A. I., Sohn, W., Lim, S., Willem, J. M. (2009). Predictors of dental caries progression in primary teeth. *Journal of Dental Research*, 88(3), 270-275.
- James J, Thomas P, Cavan D, Kerr D. Preventing childhood obesity by reducing consumption of carbonated drinks: cluster randomised controlled trial. *BMJ*. 2004 May 22;328(7450):1237.

- Kiernan M, Schoffman DE, Lee K, Moore SD, Fair J, Taylor-Piliae R, Perri MG, & Haskell WL. Using the Stanford Leisure-Time Activity Categorical Item (L- Cat) to assess changes in leisure-time activity among obese women. *Ann. Behav Med.* 2011;41:S187. Manuscript currently in preparation.
- Koordeman R, Anschutz DJ, van Baaren RB, Engels RC. Exposure to soda commercials affects sugar-sweetened soda consumption in young women. An observational experimental study. *Appetite.* 2010. 54(3):619-22.
- Kutner M, Greenberg E, Jin Y, Paulsen C. *The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy (NCES 2006-483)*. Washington, DC: US Department of Education, National Center for Education; 2006.
- Kvaavik, E., Lien, N., Tell, G., Klepp, M. Psychosocial predictors of eating habits among adults in their mid- 30s: The Oslo Youth Study follow-up 1991–1999. *Int J Behav Nutr Phys Act.* 2005; 2:9.
- Malik, V. S., Schulze, M. B., Hu, F. B. (2006). Intake of sugar-sweetened beverages and weight gain: a systematic review. *Am. J. Clin. Nutr.* 84(2), 274-288. Marshall, 2003.
- McGartland C, Robson PJ, Murray L *et al.* Carbonated soft drink consumption and bone mineral density in adolescence: the Northern Ireland Young Hearts project. *J Bone Miner Res* 2003; 18:1563–1569.
- Nielsen, SJ, Popkin BM. Changes in beverage intake between 1977 and 2001. *Am J Prev Med.* 2004; 27:205-210.
- Ntiri, D. W., & Stewart, M. (2009). Transformative learning intervention: effect on functional health literacy and diabetes knowledge in older African Americans. *Gerontology & Geriatrics Education*, 30(2), 100-113.
- Oake, N., Jennings, A., van Walraven, C., & Forster, A. J. (2009). Interactive voice response systems for improving delivery of ambulatory care. *Am J Manag Care*, 15(6), 383-391.
- Ogden, C., Carroll, M., Curtin, L., McDowell, M., Tabak, C., Flegal, K. Prevalence of Overweight and Obesity in the United States, 1999-2004. *JADA*, 2006; 295(13):1549-1555.
- Piette, J. D., McPhee, S. J., Weinberger, M., Mah, C. A., & Kraemer, F. B. (1999). Use of automated telephone disease management calls in an ethnically diverse sample of low- income patients with diabetes. *Diabetes Care*, 22(8), 1302-1309.
- Piette, J. D. (2000). Interactive voice response systems in the diagnosis and management of chronic disease. *Am J Manag Care*, 6(7), 817-827. doi: 882 [pii]

- Position of the American Dietetic Association: Use of nutritive and nonnutritive sweeteners. *JADA*. 2004;104:255-275.
- Primack BA, Sidani J, Carroll MV, Fine MJ. Associations between smoking and media literacy in college students. *Journal of Health Communication*. 2009;14:541-555.
- Primack BA, Fine D, Yang CK, Wickett D, Zickmond S. Adolescents' impressions of antismoking media literacy education: qualitative results from a randomized controlled trial. *Health Educ. Res.* 2009;24(4):608-621.
- Primack BA, Gold MA, Switzer GE, Hobbs R, Land SR, Fine MJ. Development and validation of a smoking media literacy scale for adolescents. *Arch Pediatr Adolesc Med*. 2006; 160 (4): 369-374.
- Rhodes RE, Courneya KS, Jones LW. Personality and social cognitive influences on exercise behavior: adding the activity trait to the theory of planned behavior. *Psychol Sport Exerc*. 2004;5:243-254.
- Rothman R, Malone R, Bryant B, Horlen C, DeWait D, Pignone M. The relationship between literacy and glycemic control in a diabetes disease-management program. *Diabetes Educ*. 2004;30:263-273.
- Rothman R, Housam R, Weiss H, Davis D, Gregory R, Gebrestsadik T, Shintani A, Elasy, TA. Patient understanding of food labels—The role of literacy and numeracy. *Am J Prev Med*. 2006;31:391-398.
- Schulze, M. B., Manson, J. E., Ludwig, D. S., Colditz, G. A., Stampfer, M. J., Hu, F. B. Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women. *Journal of the American Medical Association*, 2004; 292(8), 927-934.
- Sichieri R, Paula Trotte A, de Souza RA, Veiga GV. School randomised trial on prevention of excessive weight gain by discouraging students from drinking sodas. *Public Health Nutr*. 2009 Feb;12(2):197-202.
- Stookey JD, Constant F, Popkin BM, Gardner CD. Drinking water is associated with weight loss in overweight dieting women independent of diet and activity. *Obesity* 2008;16(9):2481-8.
- Striegel-Moore RH, Thompson D, Affenito SG, Franko DL, Obarzanek E, Barton BA, et al. Correlates of beverage intake in adolescent girls: the National Heart Lung and Blood Institute Growth and Health Study. *J Pediatr* 2006;148:183-7.
- Surgeon General. <http://www.surgeongeneral.gov/news/speeches/healthlit09192003.htm>
Assessed November 5, 2011.

- Tate, D., Turner-McGrivevy, G., Lyons, E., Stevens, J., Erickson, K., Polzien, K., Diamond, M., Wang, X., Popkin, B. Replacing caloric beverages with water or diet beverages for weight loss in adults: main results of the Choose Health Options Consciously Everyday (CHOICE) randomized clinical trial. *Am J Clin Nutr.* 2012;95:555-63.
- Thompson FE, McNeel TS, Dowling EC, Midthune D, Morrisette M, Zeruto CA. Interrelationships of added sugars intake, socioeconomic status, and race/ethnicity in adults in the United States: National Health Interview Survey, 2005. *J Am Diet Assoc.* 2009;109:1376-1383.
- Vartanian, L. R., Schwartz, M. B., Brownell, K. D. Effects of soft drink consumption on nutrition and health: A systematic review and meta-analysis. *American Journal of Public Health*, 2007; 97(4), 667-675.
- Vereecken, C., Henauw, S., Maes, L. Adolescents' food habits: results of the Health Behavior in School-aged Children survey. *British Journal of Nutrition* (2005), 94, 423-431.
- Wang Y, Beydoun, M. The obesity epidemic in the United States--gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. *Epidemiol Rev.* 2007; 29:6-28.
- Wang, Y., Beydoun M, Liang, L., Caballero B., Kumanyika, S. Will All Americans Become Overweight or Obese? Estimating the Progression and Cost of the US Obesity Epidemic *Obesity.* 2008. 10: 2323–2330.
- Weiss B, Mays M, Martz W et al. Quick assessment of literacy in primary care: The Newest Vital Sign. *Ann Fam Med.* 2005;3:514-22.
- Zikmund-Fisher, B.J., Smith, D.M., Ubel, P.A., Fagerlin, A. Validation of the subjective numeracy scale (SNS): Effects of low numeracy on comprehension of risk communications and utility elicitation. *Medical Decision Making*, 2007; 27: 663-671.
- Zoellner J, Connell C, Bounds W, Crook L, Yadrick K. Nutrition literacy status and preferred nutrition communication channels among adults in the Lower Mississippi Delta. *Prev Chronic Dis.* 2009;6:4.
- Zoellner J, Estabrooks E, Davy B, Chen Y, You W. Exploring the Theory of Planned Behavior to Explain Sugar-sweetened Beverage Consumption. *J Nutr Educ Behav*, 2011, In Press.

Appendix 1: IRB Approval



VirginiaTech

Office of Research Compliance
Institutional Review Board
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MEMORANDUM

DATE: September 28, 2011

TO: Jamie Zoellner, Emily Cook

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires May 31, 2014)

PROTOCOL TITLE: Talking Health Pilot Study

IRB NUMBER: 11-818

Effective September 28, 2011, the Virginia Tech IRB Chair, Dr. David M. Moore, approved the new protocol for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

PROTOCOL INFORMATION:

Approved as: Expedited, under 45 CFR 46.110 category(ies) 4, 7

Protocol Approval Date: 9/28/2011

Protocol Expiration Date: 9/27/2012

Continuing Review Due Date*: 9/13/2012

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Appendix 2: Informed Consent

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent for Participants in Research Projects Involving Human Subjects

Project Title: Talking Health-Pilot Project

Principle Investigator: Jamie Zoellner, PhD, RD, Department of Human Nutrition, Foods and Exercise

Co-Investigator: Emily Cook, Master's Student, Department of Human Nutrition, Foods and Exercise

I. Purpose of this Research/Project

Virginia Tech's Human Nutrition, Foods and Exercise Department is offering a free 5-week health program. The goal of this program is to improve your health behaviors, such as sugar intake or physical activity behaviors.

II. Procedures

This five week program will include:

- 2 small group education sessions
- 3 telephone calls to help you track your behaviors and provide you with personalized strategies for overcoming barriers

As a part of the program evaluation, you will need to participate in two health screenings, the first one will be at the beginning of the program and the second one will be after you complete the 5-week program. The health screening includes questions about your sugar intake and physical activity behaviors, your opinions about sugar and physical activity, and your health status and quality of life. In addition, your height, weight, and blood pressure will be measured. At the end of the program, we will also ask for your opinions on how we could improve the program.

The time commitment we are asking of you is outlined in the table below:

Activity	Estimated Time commitment	Total time commitment for each activity
Group education sessions	2 group education sessions, each lasting about 90 minutes	3 hours
Telephone calls	3 telephone calls, each lasting about 5-10 min	30 minutes
Health screenings	2 health screenings, each lasting about 1 hour: • Before the program begins • After the program is over	2 hours

In this study, you will be randomized- like a flip of a coin- into one of two groups. You must agree to be randomized to participate in this study. You will either receive the educational program about sugar or the program about physical activity. Both programs will start in October and end in December 2011.

III. Risks

The main risk of taking part in this program is a small risk associated with starting a physical activity program, if you have not been physically active. To lower this risk, you will always participate in the physical activity sessions at your own pace. To make sure that physical activity is not harmful to you, you will complete a health questionnaire. If your health questionnaire shows any conditions that could make taking part in a physical activity program harmful, we will ask you to see your doctor to obtain a medical release to participate in the program. We will also take your blood pressure during the health screening. If your blood pressure is high, we will ask you to see your doctor to obtain a medical release to participate.

You may experience the normal discomfort associated with a health screening. We will try to make sure you are comfortable during the screening and take your measurements in a private area. The other risk is the inconvenience of time.

If you need to seek medical services as a result of your participation in this project, neither the researchers nor Virginia Tech's Human Nutrition, Foods and Exercise Department have funds to pay for such services. For this reason, you will be responsible for paying for these services.

No form of compensation for medical treatment or for other damages (such as lost wages, time lost from work, etc.) is available from the people or organizations involved with this project.

IV. Benefits

You may benefit from learning more about healthy behaviors and improving your sugar intake or physical activity behaviors.

V. Compensation

When you finish the health screening at the beginning of the program you will receive a \$25.00 gift card. When you finish the health screening at the end of the program you will receive a \$50.00 gift card.

During the group education sessions you will receive a personal action plan, education workbooks, tracking logs, and other small incentives such as water bottles, measuring cups, or physical activity resources.

VI. Confidentiality

Your study information will all be coded with a study number, and not your name. Only the project staff and investigators will have access to your name and study number. At no time will the researchers give the results of the study to anyone other than the people working on the project without your written consent. It is possible that the Institutional Review Board (IRB) may view this project's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research. All study data will be kept for about 3 years after the project is completed.

VII. Voluntary Participation and Freedom to Withdraw

Participation is voluntary. You are free to withdraw from the study at any time without penalty. If you choose to withdraw, please contact the project director to let them know of your decision. You are free not to answer any questions or respond to any aspect of the study that you choose without penalty.

There may be reasons why the project staff decides that you cannot continue in this program. We can end your participation in this research study and program at any time, without your consent. You will be notified if this happens.

VIII. Participant's Responsibilities

If you voluntarily agree to participate in this research project, you have the following responsibilities:

- Attend, and be on time, for all scheduled health screenings. If you must miss a scheduled health screening, you will contact the project director to be rescheduled.
- Attend the weekly education sessions for 2 weeks, in the group you are assigned to.
- Participate in all weekly telephone calls for 3 weeks, one call each week.
- Inform the project director if you experience any negative effects from participating in this study.
- Inform the project director if you no longer wish to participate.

VIII. Participant's Permission

I have read the Consent Form and conditions of this project. I have had all of my questions answered. I hereby acknowledge the above and give my voluntary consent:

Subject Signature

Date_____

Subject of Person Administering

Date_____

Should I have any questions about this research or conduct of the research, I may contact:

<u>Jamie M. Zoellner</u>	<u>540-231-3670</u>	<u>zoellner@vt.edu</u>
Investigator(s)	Telephone	e-mail

Should I have any questions about the participants' human rights, or in the event of a research-related injury to the participant, I may contact:

<u>David M. Moore</u>	<u>540-231-4991/moored@vt.edu</u>
Chair, Virginia Tech Institutional Review Board for the Protection of Human Subjects Office of Research Compliance 2000 Kraft Drive, Suite 2000 (0497) Blacksburg, VA 24060	Telephone/e-mail

Appendix 3: Talking Health Recruitment Flyer



TALKING HEALTH

Let's talk about health!



Motivated people are needed to join a program to learn and talk about health.
The program includes small group classes and telephone calls.
The progress of all people who join will be tracked through a research study.

The 5-week program will be offered at no charge:

- Education sessions: Two 90-minute small group sessions
- Telephone Calls: Three 10-minute calls to help you track your behaviors and provide you with personal behavioral strategies
- Health screenings: Two 1-hour screenings (survey, weight, & height).

Names will not appear on any record, and all records will be kept private.

People will not be singled out or identified as a result of this study.

To be eligible, people must:

- Be at least 18 years of age
- Meet screening criteria
- Be able to attend the two education sessions, respond to the telephone calls, and attend the health screenings

Benefits of the study include:

- Education about sugar intake OR physical activity
- Improved health behaviors, such as sugar intake or physical activity levels
- \$75 in gift cards for completing the study

The research study will take place:

- October-December 2011
- At a location near your community (you will be notified of the exact location)

In partnership with Virginia Cooperative Extension, this research is being conducted under the direction of Dr. Jamie Zoellner, Virginia Tech, Department of Human Nutrition, Foods, & Exercise, Zoellner@vt.edu 540-231-3670

Appendix 4: Talking Health Screening Survey



Human Nutrition, Foods & Exercise

Talking Health Screening Survey

Remember that all the answers you provide are private. Only the researcher's will have access to your answers. You will not be singled out as a result of this study.

This first set of questions is about the types of beverages you have drank in the past month. Please feel free to ask any questions you have regarding the beverages or serving size options.

1. How often do you drink **sweetened juice beverages/drinks (such as fruit aides, lemonade, punch, or Sunny Delight)**?

- ☐ Never or less than 1 time per week
- ☐ 1 time per week
- ☐ 2-3 times per week
- ☐ 4-6 times per week
- ☐ 1 time per day
- ☐ 2 times per day
- ☐ 3 or more times per day

1a. When you drink **sweetened juice beverages/drink**, how much do you normally drink?

- ☐ less than 6 fluid ounces (or $\frac{3}{4}$ cup)
- ☐ 8 ounces (1 cup)
- ☐ 12 ounces (1 $\frac{1}{2}$ cups)
- ☐ 16 ounces (2 cups)
- ☐ more than 20 ounces (2 $\frac{1}{2}$ cups)

2. How often do you drink **regular soft drinks**?

- ☐ Never or less than 1 time per week
- ☐ 1 time per week
- ☐ 2-3 times per week

- ☐ 4-6 times per week
- ☐ 1 time per day
- ☐ 2 times per day
- ☐ 3 or more times per day

2a. When you drink **regular soft drinks**, how much do you normally drink?

- ☐ less than 6 fluid ounces (or $\frac{3}{4}$ cup)
- ☐ 8 ounces (1 cup)
- ☐ 12 ounces (1 $\frac{1}{2}$ cups)
- ☐ 16 ounces (2 cups)
- ☐ more than 20 ounces (2 $\frac{1}{2}$ cups)

3. How often do you drink **sweetened tea**?

- ☐ Never or less than 1 time per week
- ☐ 1 time per week
- ☐ 2-3 times per week
- ☐ 4-6 times per week
- ☐ 1 time per day
- ☐ 2 times per day
- ☐ 3 or more times per day

3a. When you drink **sweetened tea**, how much do you normally drink?

- ☐ less than 6 fluid ounces (or $\frac{3}{4}$ cup)
- ☐ 8 ounces (1 cup)
- ☐ 12 ounces (1 $\frac{1}{2}$ cups)
- ☐ 16 ounces (2 cups)
- ☐ more than 20 ounces (2 $\frac{1}{2}$ cups)

4. How often do you drink **tea or coffee, with cream and/or sugar (includes non-dairy creamer)**?

- ☐ Never or less than 1 time per week
- ☐ 1 time per week
- ☐ 2-3 times per week
- ☐ 4-6 times per week
- ☐ 1 time per day
- ☐ 2 times per day
- ☐ 3 or more times per day

4a. When you drink **tea or coffee, with cream and/or sugar**, how much do you normally drink?

- ☐ less than 6 fluid ounces (or $\frac{3}{4}$ cup)
- ☐ 8 ounces (1 cup)
- ☐ 12 ounces (1 $\frac{1}{2}$ cups)
- ☐ 16 ounces (2 cups)
- ☐ more than 20 ounces (2 $\frac{1}{2}$ cups)

5. How often do you drink **energy and sports drinks (such as Red Bull, Rockstar, Gatorade, Powerade, etc)**?

- ☐ Never or less than 1 time per week
- ☐ 1 time per week
- ☐ 2-3 times per week
- ☐ 4-6 times per week
- ☐ 1 time per day
- ☐ 2 times per day
- ☐ 3 or more times per day

5a. When you drink **energy and sports drinks**, how much do you normally drink?

- ☐ less than 6 fluid ounces (or $\frac{3}{4}$ cup)
- ☐ 8 ounces (1 cup)
- ☐ 12 ounces (1 $\frac{1}{2}$ cups)
- ☐ 16 ounces (2 cups)
- ☐ more than 20 ounces (2 $\frac{1}{2}$ cups)

This next question is about your physical activity.

During the past month, which statement best describes the kinds of physical activity you usually did during your FREE TIME (or time spent other than working at a job)? Please read all six statements before selecting one.

- ☐ 1. You did not do much physical activity. You mostly did things like watching television, reading, playing cards, or playing computer games. Only occasionally, no more than once or twice a month, did you do anything more active such as going for a walk or playing tennis.

- ☐ 2. Once or twice a week, you did light activities such as getting outdoors on the weekends for an easy walk or stroll. Or once or twice a week, you did chores around the house such as sweeping floors or vacuuming.
- ☐ 3. About three times a week, you did moderate activities such as brisk walking, swimming, or riding a bike for about 15-20 minutes each time. Or about once a week, you did moderately difficult chores such as raking or mowing the lawn for about 45-60 minutes. Or about once a week, you played sports such as softball, basketball, or soccer for about 45-60 minutes.
- ☐ 4. Almost daily, that is five or more times a week, you did moderate activities such as brisk walking, swimming, or riding a bike for 30 minutes or more each time. Or about once a week, you did moderately difficult chores or played sports for 2 hours or more.
- ☐ 5. About three times a week, you did vigorous activities such as running or riding hard on a bike for 30 minutes or more each time.
- ☐ 6. Almost daily, that is five or more times a week, you did vigorous activities such as running or riding hard on a bike for 30 minutes or more each time.

These next 3 questions will help us understand the reading needs of people taking this survey.

1. How confident are you filling out medical forms by yourself?
 - ☐ Extremely confident
 - ☐ Quite a bit confident
 - ☐ Somewhat confident
 - ☐ A little bit confident
 - ☐ Not at all confident
2. How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?
 - ☐ Never
 - ☐ Rarely
 - ☐ Sometime
 - ☐ Often
 - ☐ Always

3. How would you rate your ability to read?

- ☐ Excellent or very good
- ☐ Good
- ☐ Okay
- ☐ Poor
- ☐ Terrible or very poor

This next set of questions is about your health as it relates to exercise.

Please check ONE answer, yes or no.

1. Do you have any chest pain or lightheadedness when you exercise?

- ☐ Yes
- ☐ No

2. Do you have any joint pain that is worsened by exercise?

- ☐ Yes
- ☐ No

3. Have you ever experienced any allergic reactions from exercise (hives or wheezing)?

- ☐ Yes
- ☐ No

4. Have you been told by your doctor not to exercise for any reason?

- ☐ Yes, please explain: _____
- ☐ No

5. Do you have a pacemaker or internal defibrillator?

- ☐ Yes
- ☐ No

6. Is there any other reason we have not asked or you have not told us that would prevent you from participating in an exercise program?

- ☐ Yes, please explain: _____
☐ No

This final set of questions is needed to help us understand the people taking this survey.

1. What is your gender?

- ☐ Male
☐ Female

2. What is your marital status (please choose only one)?

- ☐ Married
☐ Divorced
☐ Widowed
☐ Separated
☐ Never married
☐ A member of an unmarried couple

3. Please indicate which of the following best describes you (choose all that apply).

- ☐ White
☐ Black or African American
☐ Asian
☐ American Indian/Alaskan Native
☐ Native Hawaiian or Other Pacific Islander
☐ Not sure
☐ Other: _____

4. Please indicate which of the following best describes you (please choose only one).

- ☐ Hispanic or Latino
☐ Not Hispanic or Latino
☐ Not sure

5. What is your age? _____

6. Please mark the highest grade of school that you have completed (please choose only one).

- ☐ Grades 0-8
☐ Grades 9-11
☐ High school
☐ Some college

- ☐ College graduate
- ☐ Graduate school

7. Are you currently (choose all that apply)?

- ☐ Employed for wages full-time
- ☐ Employed for wages part-time
- ☐ Self-employed
- ☐ Out of work for more than 1 year
- ☐ Out of work for less than 1 year
- ☐ A homemaker
- ☐ A student
- ☐ Retired
- ☐ Unable to work

8. Of these income groups, please choose which number best represents your family's total income (before taxes) in the last 12 months (please choose only one).

- ☐ Less than \$5,000
- ☐ \$5,000-9,999
- ☐ \$10,000-14,999
- ☐ \$15,000-19,999
- ☐ \$20,000-24,999
- ☐ \$25,000-29,999
- ☐ \$30,000-34,999
- ☐ \$35,000-39,999
- ☐ \$40,000-44,999
- ☐ \$45,000-49,999
- ☐ \$50,000-54,999
- ☐ More than \$55,000

9. How many children under the age of 18 years do you have that currently live in your home (please choose only one)?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ More than 4

Does your typical schedule allow you to attend an education session on:

1. Tuesday mornings from 10:00-11:30 a.m.?

☐ Yes

☐ No

Comments:

2. Tuesday evenings from 6:00-7:30 p.m.?

☐ Yes

☐ No

Comments:

3. Thursday mornings from 10:00-11:30 a.m.?

☐ Yes

☐ No

Comments:

4. Thursday evenings from 6:00-7:30 p.m.?

☐ Yes

☐ No

Comments:

5. May we contact you to provide you with more information on the Talking Health Program?

☐ No

☐ Yes, please provide your contact information:

Name: _____

Address: _____

Home Telephone Number: _____

Cell Phone Number: _____

Email Address: _____

Appendix 5: Talking Health Computer Audio-Assisted Questionnaire

[PARTICIPANT ID Number]: |__||__||__||__||__|

[DATA COLLECTOR ID Number]: |__||__|



Department of Human Nutrition, Foods & Exercise

Talking Health Survey

Thank you for participating in the Talking Health study! Congratulations for taking part in this important study!

Please listen to the instructions closely. All of the questions and answer choices will be read aloud to you. There are no right or wrong answers, please just report your honest opinions. Some of the questions may sound the same; this helps the project directors to fully understand your thoughts about the questions. It is important that you answer as many questions as you can.

Module Number	Title	Number of Items
Module 1	Beverage Questionnaire	15 items- frequency & portion for each
Module 2	Physical Activity Questionnaire	1 item
Module 3	Opinions about Sugary Drinks	20 items
Module 4	Media Literacy	19 items
Module 5	Subjective Numeracy	8 items
Module 6	Opinions about Physical Activity	20 items
Module 7	Quality of Life	4 items

Module 1:

Beverage Questionnaire

For this set of questions you will be asked to report your usual beverage choices over the past one month. There are 15 different beverage categories in this section. For each of the beverage categories, please report “how often” you had the beverage, for example:

- If you drank 5 glasses of water per week, choose the option that indicates 4-6 times per week

Module 2:

Physical Activity Measures

During the past month, which statement best describes the kinds of physical activity you usually did? Do not include the time you spent working at a job. Please read all six statements before selecting one.

1. You did not do much physical activity. You mostly did things like watching television, reading, playing cards, or playing computer games. Only occasionally, no more than once or twice a month, did you do anything more active such as going for a walk or playing tennis.
2. Once or twice a week, you did light activities such as getting outdoors on the weekends for an easy walk or stroll. Or once or twice a week, you did chores around the house such as sweeping floors or vacuuming.
3. About three times a week, you did moderate activities such as brisk walking, swimming, or riding a bike for about 15-20 minutes each time. Or about once a week, you did moderately difficult chores such as raking or mowing the lawn for about 45-60 minutes. Or about once a week, you played sports such as softball, basketball, or soccer for about 45-60 minutes.
4. Almost daily, that is five or more times a week, you did moderate activities such as brisk walking, swimming, or riding a bike for 30 minutes or more each time. Or about once a week, you did moderately difficult chores or played sports for 2 hours or more.
5. About three times a week, you did vigorous activities such as running or riding hard on a bike for 30 minutes or more each time.
6. Almost daily, that is five or more times a week, you did vigorous activities such as running or riding hard on a bike for 30 minutes or more each time.

Module 3:

Opinions about Sugary Drinks

The next questions ask you to rate how you feel about sugary drinks. Let's first review what counts as a sugary drink and what does not.

Sugary drinks include:	Sugary drinks DO NOT include:
• Regular Soft Drinks or Soda such as Coke or Pepsi, Sprite or 7-up, Dr. Pepper, Mountain Dew • Sugar-Sweetened Juice Beverages such as fruit aides, lemonade, punch or Kool-Aid, Sunny Delight • Sweetened Tea (Tea with sugar) • Coffee with Sugar Think about these types of drinks when you respond to the next set of questions.	• Diet Soft Drinks or Sodas such as Diet Coke or Diet Pepsi, Diet Sprite or Diet 7-up, Diet Dr. Pepper, Diet Mountain Dew • Unsweetened tea or other beverages with artificial sweeteners such as Splenda, Equal, or Sweet n Low • 100% fruit juice DO NOT think about these types of drinks when you respond to the next set of questions.

All of the questions will ask you about drinking less than 1 cup of sugary drinks each day.

Less than 1 cup equals **0 to 1 cups** total of sugary drinks for an entire day.

Sugary drinks include:

- **Regular Soft Drinks or Soda** such as Coke or Pepsi, Sprite or 7-up, Dr. Pepper, Mountain Dew
- **Sugar-Sweetened Juice Beverages** such as fruit aides, lemonade, punch or Kool-Aid, Sunny Delight
- **Sweetened Tea (Tea with sugar)**
- **Coffee with Sugar**

Think about these types of drinks when you respond to the next set of questions.

PART A: Your beliefs about sugary drinks

The next questions ask what you think about drinking less than 1 cup of sugary drinks per day. Pick the best number that best represents you for each question and select it.

For you, drinking less than 1 cup of sugary drinks each day would be:

1.

1	2	3	4	5	6	7
extremely enjoyable	quite enjoyable	slightly enjoyable	neither enjoyable or unenjoyable	slightly unenjoyable	quite unenjoyable	extremely unenjoyable
2.

1	2	3	4	5	6	7
extremely healthy	quite healthy	slightly healthy	neither healthy or unhealthy	slightly unhealthy	quite unhealthy	extremely unhealthy
3.

1	2	3	4	5	6	7
extremely pleasant	quite pleasant	slightly pleasant	neither pleasant or unpleasant	slightly unpleasant	quite unpleasant	extremely unpleasant
4.

1	2	3	4	5	6	7
extremely wise	quite wise	slightly wise	neither wise or unwise	slightly unwise	quite unwise	extremely unwise
5.

1	2	3	4	5	6	7
extremely boring	quite boring	slightly boring	neither boring or exciting	slightly exciting	quite exciting	extremely exciting

6.

1	2	3	4	5	6	7
extremely harmful	quite harmful	slightly harmful	neither harmful or beneficial	slightly beneficial	quite beneficial	extremely beneficial

PART B: What other people think about you drinking sugary drinks

The next questions ask you about what other people (like your friends and family) think about you drinking sugary drinks. Pick the number that best represents you for each question and select it. Remember to think about your friends and family when answering.

1. Most people who are important to you want you to drink less than 1 cup of sugary drinks each day.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. For most people whose opinions you value, how would they feel about you drinking less than 1 cup of sugary drinks each day?

1	2	3	4	5	6	7
completely disapprove	moderately disapprove	slightly disapprove	neither disapprove or approve	slightly approve	moderately approve	completely approve

3. Most people who are important to you will drink less than 1 cup of sugary drinks each day.

1	2	3	4	5	6	7
completely untrue	quite untrue	slightly untrue	neither untrue or true	slightly true	quite true	completely true

PART C: Barriers to drinking less than 1 cup of sugary drinks each day

These next questions are concerned with how much control you believe you have over limiting your sugary drinks to 1 cup or less each day. Pick the number that best represents you for each question and select it.

1. You have complete personal control over limiting your sugary drinks to less than 1 cup each day, if you really wanted to.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. Limiting your sugary drinks to less than 1 cup each day is mostly up to you if you wanted to.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

3. Limiting your sugary drinks to less than 1 cup of sugary drinks each day if you wanted to do so would be:

1	2	3	4	5	6	7
extremely difficult	quite difficult	slightly difficult	neither difficult or easy	slightly easy	quite easy	extremely easy

PART D: Motivation to limit sugary drinks to less than 1 cup each day

The next questions ask you about your motivation to limit your sugary drinks to less than 1 cup each day. Pick the number that best represents you for each question and select it.

1. You plan to limit your sugary drinks to less than 1 cup each day.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. How many days per week do you intend to limit your sugary drinks to less than 1 cup?

0	1	2	3	4	5
6	7				

3. How motivated are you to limit your sugary drinks to less than 1 cup each day?

1	2	3	4	5	6	7
extremely unmotivate d	quite unmotivate d	slightly unmotivate d	neither unmotivate d or motivated	slightly motivate d	quite motivate d	extremel y motivate d

4. How determined are you are to limit you sugary drinks to less than 1 cup each day?

1	2	3	4	5	6	7
extremely	quite	slightly	neither	slightly	quite	extremely
undetermined	undetermined	undetermined	undetermined	determined	determined	determined
			or			
			determined			

PART E: Plans to limit your sugary drinks to less than 1 cup each day

The next questions ask you about your plans to limit your sugary drinks to less than 1 cup each day. Pick the number that best represents you for each question and select it.

1. You have made plans concerning when you are going to limit your sugary drinks to less than 1 cup each day.

1	2	3	4	5	6	7
strongly	moderately	slightly	neither	slightly	moderately	strongly
disagree	disagree	disagree	disagree	agree	agree	agree
			or agree			

2. You have made plans concerning where you are going to limit your sugary drinks to less than 1 cup each day (for example: at home or at work).

1	2	3	4	5	6	7
strongly	moderately	slightly	neither	slightly	moderately	strongly
disagree	disagree	disagree	disagree	agree	agree	agree
			or agree			

3. You have made plans concerning what drinks you will use as a replacement for your sugary drinks each day.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

4. You have made plans concerning how you are going to limit your sugary drinks to less than 1 cup each day.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

Module 4:

Media Literacy

This next section is about the media and ads as it relates to sugary drinks. Some of the questions are also about sugary drink companies. When you think of sugary drink companies, please think about companies like Coca-Cola or PepsiCo or Nestea.

1. Grocery store or convenient store deals on sugary drinks, like buy-one-get-one free and other sales, are designed to get people addicted to sugar.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

2. Sugary drink companies are very powerful, even outside of the beverage business.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

3. Sugary drink companies only care about making money.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

4. Certain sugary drink brands are designed to appeal to people like me.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

5. When designing an ad campaign, sugary drink companies think very carefully about the people they want to buy their beverages.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

6. Wearing a shirt with a sugary drink logo on it makes you a walking advertisement.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

7. Sugary drink ads link drinking these beverages to things people want, like love, good looks, and power.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

8. Two people may see the same movie or TV show and get very different ideas about it.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

9. Different people can see the same sugary drink ad in a magazine and feel completely different about it.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

10. A sugary drink ad may catch one person's attention but not even be noticed by another person.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

11. People are influenced by TV and movies, whether they realize it or not.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

12. People are influenced by advertising.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

13. When people make movies and TV shows, every camera shot is very carefully planned.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

14. There are hidden messages in sugary drink ads.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

15. Most movies and TV shows that show people drinking sugary drinks make it look more attractive than is really is.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

16. Sugary drink ads show a healthy lifestyle to make people forget about the health risks, such as weight gain and diabetes.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

17. When you see a buy-one-get-one-free or other type of sugary drink sale, it's usually not actually a good deal in the long run.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

18. When you see a sugary drink ad, it is very important to think about what was left out of the ad.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

19. Advertisements usually leave out a lot of important information.

1	2	3	4
definitely NO	mostly NO	mostly YES	definitely YES

Module 5: Subjective Numeracy Scale

For each of the next questions, please select the number that best reflects how good you are at doing the following things.

1. How good are you at working with fractions?

1	2	3	4	5	6	7
not at all good					extremely good	

2. How good are you at working with percentages?

1	2	3	4	5	6	7
not at all good					extremely good	

3. How good are you at calculating a 15% tip?

1	2	3	4	5	6	7
not at all good						extremely good

4. How good are you at figuring out how much a shirt will cost if it is 25% off?

1	2	3	4	5	6	7
not at all good						extremely good

5. When reading the newspaper, how **helpful** do you find tables and graphs that are parts of a story?

1	2	3	4	5	6	7
not at all helpful						extremely helpful

6. When people tell you the chance of something happening, do you prefer that they use **words** ("it rarely happens") or **numbers** ("there's a 1% chance")?

1	2	3	4	5	6	7
always prefer words						always prefer numbers

7. When you hear a weather forecast, do you prefer predictions using **percentages** (for example “there will be a 20% chance of rain today”) or predictions using only **words** (for example “there is a small chance of rain today”)?

1	2	3	4	5	6	7
always prefer percentag es						always prefer words

8. How **often** do you find numerical information to be useful?

1	2	3	4	5	6	7
never						very often

Module 6:

Opinions about Physical Activity

PART A: Beliefs about moderate-intensity physical activity

The next questions ask you to rate how you feel about moderate-intensity physical activity.

Regular moderate-intensity physical activity is defined as:

- | |
|---|
| <ul style="list-style-type: none"> • working hard enough to raise your heart rate and break a sweat for <u>at least 30 minutes, 5 times per week or more during your free time</u> |
|---|

Moderate-intensity physical activities can include:

- | |
|--|
| <ul style="list-style-type: none"> • brisk walking, swimming, or riding a bike • moderately difficult chores such as raking or mowing the lawn |
|--|

- playing sports such as softball, basketball

Pay careful attention to the words at each end of the scales and select the number that best represents how you feel about moderate-intensity physical activity.

For you, moderate-intensity physical activity over the next 1 month would be:

- | | | | | | | |
|-----------|-----------|-----------|--------------------------------|-------------|-------------|-------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| extremely | quite | slightly | neither | slightly | quite | extremely |
| enjoyable | enjoyable | enjoyable | enjoyable
or
unenjoyable | unenjoyable | unenjoyable | unenjoyable |
- | | | | | | | |
|-----------|---------|----------|-------------------------|-----------|-----------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| extremely | quite | slightly | neither | slightly | quite | extremely |
| healthy | healthy | healthy | healthy or
unhealthy | unhealthy | unhealthy | unhealthy |
- | | | | | | | |
|-----------|----------|----------|------------------------------|------------|------------|------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| extremely | quite | slightly | neither | slightly | quite | extremely |
| pleasant | pleasant | pleasant | pleasant
or
unpleasant | unpleasant | unpleasant | unpleasant |
- | | | | | | | |
|-----------|-------|----------|-------------------|----------|--------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| extremely | quite | slightly | neither | slightly | quite | extremely |
| wise | wise | wise | wise or
unwise | unwise | unwise | unwise |
- | | | | | | | |
|-----------|-------|----------|---------|----------|-------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| extremely | quite | slightly | neither | slightly | quite | extremely |

	boring	boring	boring	boring or exciting	exciting	exciting	exciting
6.	1	2	3	4	5	6	7
	extremely harmful	quite harmful	slightly harmful	neither harmful or beneficial	slightly beneficial	quite beneficial	extremely beneficial

PART B: What other people think about your moderate-intensity physical activity

The next questions ask you about what other people in your social network (like your friends and family) think about you engaging in regular moderate-intensity physical activity. Pick the number between 1 and 7 that best represents you for each question and select it. Remember to think about your friends and family when answering these questions.

1. Most people who are important to you want you to engage in moderate-intensity physical activity over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. For most people whose opinions you value, how would they feel about you engaging in moderate-intensity physical activity over the next 1 month?

1	2	3	4	5	6	7
completely disapprove	moderately disapprove	slightly disapprove	neither disapprove or approve	slightly approve	moderately approve	completely approve

3. Most people who are important to you will engage in regular moderate-intensity physical activity themselves over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

PART C: Barriers to regular moderate-intensity physical activity

These next questions are concerned with how much control you believe you have over moderate-intensity physical activity in the next 1 month. Please listen to the questions carefully and select the number that best represents your beliefs.

1. In the next 1 month, you have complete personal control over moderate-intensity physical activity if you really wanted to do so:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. Engaging in moderate-intensity physical activity is mostly up to you in the next 1 month if you wanted to do so:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

3. Engaging in moderate-intensity physical activity over the next 1 month if you wanted to do so would be:

1	2	3	4	5	6	7
extremely difficult	quite difficult	slightly difficult	neither difficult or easy	slightly easy	quite easy	extremely easy

PART D: Motivation to Engage in Moderate-Intensity Physical Activity

The next questions ask you about your motivation to engage in regular moderate-intensity physical activity. Pick the number that best represents you for each question and select it.

1. You plan to engage in regular moderate-intensity physical activity over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. How many times per week do you intend to engage in regular moderate-intensity physical activity over the next 1 month.

0 1 2 3 4 5 6 7

3. How motivated are to engage in moderate-intensity physical activity over the next 1 month?

1	2	3	4	5	6	7
extremely unmotivated	quite unmotivated	slightly unmotivated	neither unmotivated or motivated	slightly motivated	quite motivate	extremely motivated

4. How determined are you to engage in moderate-intensity physical activity over the next 1 month?

1	2	3	4	5	6	7
extremely undetermined	quite undetermined	slightly undetermined	neither undetermined or determined	slightly determined	quite determined	extremely determined

PART E: Plans to engage in regular moderate-intensity physical activity

The next questions ask you about your plans to engage in regular moderate-intensity physical activity. Pick the number that best represents you for each question and select it.

1. You have made plans concerning when you are going to engage in moderate-intensity physical activity over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

2. You have made plans concerning where you are going to engage in moderate-intensity physical activity over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

3. You have made plans concerning what kind of moderate-intensity physical activity you are going to engage in over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

4. You have made plans concerning how you are going to get to a place to engage in moderate-intensity physical activity over the next 1 month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree or agree	slightly agree	moderately agree	strongly agree

Module 7:

Quality of Life

The next four questions ask you about your health. Pick the response that best represents you or select the number of days from the drop down menu.

1. Would you say that in general your health is:

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

- ☐ None

___ Number of days [drop down box?]

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

☐ None

___ Number of days [drop down box?]

[If both Q2 AND Q3 = "None", skip next question]

4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

☐ None

___ Number of days [drop down box?]

Appendix 6: In-Person Assessment

“Talking Health- Pilot Study”

[PARTICIPANT ID NUMBER]: |__||__||__||__||__|

[DATE]: []/[]/[]

[RECORD MONTH/DAY/YEAR]

Randomized to:

☐ SipSmartER

[] Move More

[COMMENTS]:

[DATA COLLECTOR ID Number]: |__||__|

Anthropometric and Body Composition (ABC) Data Collection Form

|__||__||__|

ABC01. Height

[Record number of centimeters]

|__|__|__|.|__|

ABC02. Weight

[Record number of kilograms]

[If participant is female, go to ABC03, if participant is male go to ABC05.]

|__|

ABC03. Are you pregnant? **[Record (Y) Yes or (N) No]**

|__|__|__|.|__|

ABC04. If yes, what was her weight before pregnancy:

[Ask participant to estimate weight to best of their ability.]

[Record number of kilograms]

|__|__|.|__|

ABC05. Body Mass Index (BMI)

[Record BMI]

Blood Pressure (BP) Data Collection Form

☐ BP01. Have you been told by a healthcare provider that you have high blood pressure?

[1] Yes

[2] No (Skip to number BP06)

☐ BP02. In the past 30 days, have you used any prescription medication to help control your blood pressure? Prescription medications are products prescribed by a doctor. I do not need you to report over-the-counter medications. I am only interested in medications prescribed by your doctor.

[1] Yes

[2] No (Skip to number BP06)

[98] Don't Know

[99] Refused

☐ BP03. In the past 30 days has the amount or dose of your blood pressure medication increased, decreased, or stayed the same?

[1] Increased

[2] Decreased

[3] Stayed the same

[98] Don't Know

[99] Refused

☐ BP04. How often do you forget to take your blood pressure medication?

[1] Never

[2] Rarely

[3] Sometimes

[4] Often

[5] Always

☐ BP05. How many days since you last took your blood pressure medication?

[1] I took it today

[2] I took it yesterday

[3] I took it 2-3 days ago

[4] I took it 4-7 days ago

[5] More than 1 week ago

☐ BP06. Do you currently smoke cigarettes, cigars or a pipe?

[1] Yes

[2] No (Skip to number BP08)

☐ BP07. Have you smoked cigarettes, cigars or a pipe within the last one hour?

[1] Yes

[2] No

☐ BP08. Have you exercised within the last one hour?

[1] Yes

[2] No

|__| BP09. Have you consumed any caffeine within the last one hour? Sources of caffeine include coffee, tea, soda pops (such as Coke, Pepsi, Dr. Pepper, and Mountains Dew, etc.), energy Drinks or energy shots, chocolate, and/or diet pills.

[1] Yes

[2] No

|__|__|__| BP10. Arm Circumference

[Record centimeters]

|__| BP11. Cuff Size

[Record (1) small, (2) medium, (3) large, (4) extra large]

|__|__|__| BP12. Systolic Blood Pressure

[Record systolic blood pressure]

|__|__|__| BP13. Diastolic Blood Pressure

[Record diastolic blood pressure]

[If participant is in the “acute high blood pressure,” category for diastolic or systolic, take second measure and go to BP14.]

|__|__|__| BP14. Systolic Blood Pressure (Second Measure)

[Record second systolic blood pressure if needed]

|__|__|__| BP15. Diastolic Blood Pressure (Second Measure)

[Record second diastolic blood pressure if needed]

[NOTE: If participant is in the “acute high blood pressure” category for diastolic or systolic report to Project Investigator.]

Newest Vital Sign (NVS)

[SHOW NUTRITION LABEL HANDCARD]

[READ TO RESPONDENT]: “This next section only takes a few minutes because there are only 5-6 questions. Please use the nutrition label provided to answer the following questions. This information is on the back of a container of one pint of ice cream.”

[NOTE: Provide respondent with scratch paper if necessary.]

NVS1. If you eat the entire container, how many calories will you eat?

| _____
—|

[RECORD ANSWER or check below]

| ____ | **[98] I don’t know/Refused to answer**

NVS2. If you are allowed to eat 60 grams of carbohydrate as a snack, how much ice cream could you have?

| _____

[RECORD ANSWER or check below]

[NOTE: IF PARTICIPANT ANSWERS ‘Two servings’ ASK “How much ice cream would that be if you were to measure it into a bowl?”]

☐ **[98] I don't know/Refused to answer**

NVS3. Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have a total of 42 grams of saturated fat each day, which includes one serving of ice cream. If you stop eating the one serving of ice cream, how many grams of saturated fat would you be eating each day?

—|

[RECORD ANSWER or check below]

☐ **[98] I don't know/Refused to answer**

NVS4. If you usually eat 2500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?

—|

[RECORD ANSWER or check below]

☐ **[98] I don't know/Refused to answer**

NVS5. Pretend that you are allergic to the following substances: Penicillin, peanuts, latex gloves, and bee stings. Is it safe for you to eat this ice cream?

—|

[RECORD ANSWER or check below]

☐ **[98] I don't know/Refused to answer**

NVS6. [ASK ONLY IF THE PATENT RESPONDS "NO" TO QUESTION 5].

Why not?

[RECORD ANSWER or check below]

☐ **[98] I don't know/Refused to answer**

Appendix 7: Talking Health Group Session Evaluation

Instructions: For each question below, please circle the face that you most agree with. Feel free to add any additional comments in the far right column. Please answer the questions on the back of this page as well. Thanks!



Strongly Agree

Agree

Neither Agree
or Disagree

Disagree

Strongly Disagree

Please Circle One Face

Comments:

The session was well organized.		
The information was easy to understand.		
The activities were fun.		
The session was the right amount of time.		
I learned things in the session that I did not know before.		
The presenters seemed to understand my concerns.		

The presenters knew what they were talking about.



*PLEASE TURN OVER

Please answer the following questions:

1.) What was your favorite part about this session?

2.) What would you suggest we change about this session?

3.) Do you have any other comments about this session?

We appreciate your feedback!

Appendix 8: Talking Health Follow-up Assessment

To be completed at the follow-up assessment.

The last thing that we need you to do today is a feedback questionnaire. We want to thank you for participating in this program and would like to get your honest feedback about how we can improve the program. I will read you a series of questions and will be recording your answers. Do you have any questions before we get started?

Group Session #1

1. What was your favorite part about the first group session?
2. What would you suggest we change about the first group session?
3. What were the 2 or 3 most important things you learned from the first group session about [insert behavior, i.e. sugary drinks or physical activity]?

Diaries

1. Now I'm interested in learning your opinions about the [insert behavior, i.e. sugary drink or physical activity levels] diaries. How did you feel about doing that? [if needed, probe more on likes/dislikes or benefits/barriers]

2. Was it hard or easy to keep track? Why?

3. Was it hard or easy to figure out averages each day and each week? Why?

Telephone Calls

- 1.) What was your favorite part about the telephone calls?

- 2.) What did you dislike about the telephone calls?

- 3.) What did you like or dislike about having to report about your [insert behavior, i.e. sugary drink intake or physical activity levels] diary information on the phone?
- 4.) How did the telephone calls help you address your barriers about [insert behavior, i.e. sugar intake or physical activity]?
- 5.) Where the strategies offered to address the barriers helpful to you? Why or why not?
- 6.) What would you suggest that we change about the telephone calls in future studies?

MOVE MORE ONLY

- 1.) Talk to me about your use of the DVD we provided?
 - a.) If used: likes/dislikes?

b.) If not used: why not?

2.) Talk to me about your use of the exercise band we provided?

a.) If used: likes/dislikes?

b.) If not used: why not?

SipSmarter ONLY

1.) Did you use the additional handouts provided in the workbook (if yes, probe on usefulness, likes/dislikes)?

Final Question:

1.) Is there anything else that you would like to add that can help us improve our program?

Appendix 9: Using the TPB to Predict SSB Behaviors	R²	F	p-value model	Standardized Coefficients in Final Model	p-value standardized coefficient
Model 2					
Step 1: Implementation Intentions	.013	.232	.636	.100	.683
Step 2: Behavioral Intentions (Total)	.066	.601	.560	-.327	.175
Step 3: Perceived Behavioral Control	.075	.434	.732	.230	.287
Step 4: Subjective Norms (3Q)	.483	2.028	.134	-.096	.687
Step 4: Attitudes (Instrumental)				.236	.341
Step 4: Attitudes (Affective)				-.545	.028
Model 3					
Step 1: Implementation Intentions	.013	.232	.636	.137	.550
Step 2: Behavioral Intentions (Total)	.066	.601	.560	-.349	.143
Step 3: Perceived Behavioral Control	.075	.434	.732	.243	.274
Step 4: Subjective Norms (2Q)	.478	1.983	.142	.037	.870
Step 4: Attitudes (Instrumental)				-.561	.025
Step 4: Attitudes (Affective)				.192	.443
Model 4					
Step 1: Implementation Intentions	.013	.232	.636	-.010	.971
Step 2: Behavioral Intentions (Total)	.066	.601	.560	-.218	.423
Step 3: Perceived Behavioral Control	.075	.434	.732	.149	.565
Step 4: Subjective Norms (2Q)	.183	.626	.683	.175	.512
Step 4: Attitudes (Total)				-.331	.211
No Implementations Intentions					
Model 5					
Step 1: Behavioral Intentions (Intention)	.067	.613	.553	.081	.791
Step 1: Behavioral Intentions (Motivation)				-.390	.227
Step 2: Perceived Behavioral Control	0.86	.502	.687	.327	.293
Step 3: Subjective Norms (2Q)	.238	.872	.524	.288	.313
Step 3: Attitudes (Instrumental)				-.398	.138
Step 3: Attitudes (Affective)					
Model 6					
Step 1: Behavioral Intentions (Total)	.065	1.261	.276	-.295	.165
Step 2: Perceived Behavioral Control	.075	.691	.515	.221	.299
Step 3: Subjective Norms (2Q)	.463	2.412	.089	.037	.868
Step 3: Attitudes (Instrumental)				.165	.490
Step 3: Attitudes (Affective)				-.550	.023
Model 7					
Step 1: Behavioral Intentions (Total)	.065	1.261	.276	-.221	.368
Step 2: Perceived Behavioral Control	.075	.691	.515	.151	.544
Step 3: Subjective Norms (2Q)	.183	.837	.522	.176	.495
Step 3: Attitudes (Total)				-.331	.195

Model 8					
Step 1: Behavioral Intentions (Total)	.065	1.261	.276	-.286	.173
Step 2: Perceived Behavioral Control	.075	.691	.515	.214	.297
Step 3: Subjective Norms (3Q)	.477	2.549	.077	-.132	.538
Step 3: Attitudes (Instrumental)				.230	.335
Step 3: Attitudes (Affective)				-.533	.025

Appendix 10: Using the TPB to Predict Physical Activity Behaviors	R²	F	p-value model	Standardized Coefficients in Final Model	p-value standardized coefficient
Model 2					
Step 1: Implementation Intentions	.002	.044	.836	.011	.976
Step 2: Behavioral Intentions (Total)	.014	.124	.884	-.186	.599
Step 3: Perceived Behavioral Control	.032	.177	.910	.009	.974
Step 4: Subjective Norms (3Q)	.357	1.205	.363	.085	.729
Step 4: Attitudes (Instrumental)				.709	.051
Step 4: Attitudes (Affective)				-.210	.589
Model 3					
Step 1: Implementation Intentions	.002	.044	.836	.139	.673
Step 2: Behavioral Intentions (Total)	.014	.124	.884	-.214	.514
Step 3: Perceived Behavioral Control	.032	.177	.910	.154	.574
Step 4: Subjective Norms (2Q)	.453	1.792	.178	-.426	.144
Step 4: Attitudes (Instrumental)				.916	.014
Step 4: Attitudes (Affective)				-.201	.572
Model 4					
Step 1: Implementation Intentions	.002	.044	.836	.063	.863
Step 2: Behavioral Intentions (Total)	.014	.124	.884	-.228	.531
Step 3: Perceived Behavioral Control	.032	.177	.910	-.152	.552
Step 4: Subjective Norms (2Q)	.268	1.023	.441	-.297	.336
Step 4: Attitudes (Total)				.644	.052
No Implementations Intentions					
Model 5					
Step 1: Behavioral Intentions (Intention)	.003	.022	.978	.585	.082
Step 1: Behavioral Intentions (Motivation)	.037	.206	.891	-.699	.028
Step 2: Perceived Behavioral Control	.615	3.463	.029	-.037	.875
Step 3: Subjective Norms (2Q)				-.428	.080
Step 3: Attitudes (Instrumental)				1.230	.001
Step 3: Attitudes (Affective)				-.414	.197
Model 6					
Step 1: Behavioral Intentions (Total)	.001	.025	.876	-.124	.604
Step 2: Perceived Behavioral	.021	.186	.832	.133	.610

Control					
Step 3: Subjective Norms (2Q)	.445	2.243	.107	-.402	.145
Step 3: Attitudes (Instrumental)				.907	.012
Step 4: Attitudes (Affective)				-.177	.602
Model 7					
Step 1: Behavioral Intentions (Total)	.001	.025	.876	-.187	.478
Step 2: Perceived Behavioral Control	.021	.186	.832	-.158	.517
Step 3: Subjective Norms (2Q)	.266	1.359	.295	-.287	.327
Step 3: Attitudes (Total) (Total)				.650	.041
Model 8					
Step 1: Behavioral Intentions (Total)	.001	.025	.876	-.179	.489
Step 2: Perceived Behavioral Control	.021	.186	.832	.008	.976
Step 3: Subjective Norms (3Q)	.357	1.556	.236	.087	.706
Step 3: Attitudes (Instrumental)				.709	.042
Step 3: Attitudes (Affective)				-.207	.571

Appendix 11: Correlation between SSB vs. Physical Activity Constructs

SSB Constructs	PA Constructs	Pearson's Correlation	p- value
SSB Attitudes Total	PA Attitudes Total	.297	.204
SSB Attitudes Instrumental	PA Attitudes Instrumental	.221	.349
SSB Attitudes Affective	PA Attitudes Affective	.082	.730
SSB Subjective Norms	PA Subjective Norms	-.107	.653
SSB Subjective Norms (2Q)	PA Subjective Norms (2Q)	.323	.165
SSB Perceived Behavioral Control	PA Perceived Behavioral Control	.206	.383
SSB Intention (Total)	PA Intention (Total)	.298	.202
SSB Intention (Intentions)	PA Intention (Intentions)	.287	.219
SSB Intentions (Motivation)	PA Intentions (Motivation)	.076	.751
SSB Implementations	PA Implementations	.349	.132