

Exploring how enrollment strategies, social support, and network densities influence reach, engagement, retention, and behavior change among intervention participants in southwest Virginia

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ABSTRACT

Successful recruitment and engagement of participants is essential for large-scale dissemination and implementation efforts, yet it is especially challenging in socioeconomically disadvantaged communities. This mixed-methods study is a secondary analysis of a behavioral intervention targeting Appalachian adults, and examines the effect of enrolling with others versus enrolling alone in regards to reach, engagement, retention, and behavior change, as well as perceived barriers to program participation. Further, this study explores how engagement, retention, and behavior change are influenced by social networks. Contrary to our hypothesis, using an ‘enrolling with others’ recruitment strategy did not improve reach, engagement, retention, or behavior change; rather, enrolling alone was associated with greater significant differences in engagement in classes ($p=.042$), missed class calls ($p=.005$), total activities ($p=.001$), and retention ($p<.001$). Qualitative responses reveal barriers to engagement by both groups of participants. Network density scores had a significant impact on participant engagement in classes ($p=.001$), total activities ($p=.024$), and retention ($p<.001$), and qualitative responses identified the participant’s relationship to other participants had a positive impact on their enrollment and behavior change in *SIPsmartER*. However, these findings are limited by the small sample size and high enrollment of a worksite with a high network density and high engagement. The findings and limitations paired with the enrolling with others and social network literature suggest the need for exploration with a larger study population to better understand the impact on reach, engagement, retention, and behavior change in behavioral interventions targeting individuals from socioeconomically disadvantaged communities.

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GENERAL AUDIENCE ABSTRACT

Successful recruitment and engagement of participants is essential for large-scale dissemination and implementation, yet it is especially challenging in socioeconomically disadvantaged communities. This mixed-methods study is a secondary analysis of a behavioral intervention targeting Appalachian adults, and examines the effect of enrolling with others (i.e., referring an individual to join) versus enrolling alone in regards to reach, engagement, retention, and behavior change, as well as participants' perceived barriers to participation. Further, this study explores how these characteristics are influenced by participants' social networks. Contrary to our hypothesis, enrolling with others did not improve reach, engagement, retention, or behavior change; rather, enrolling alone was associated with greater engagement in classes, missed class calls, total activities, and retention. However, participants who enrolled with others and enrolled alone identified various barriers impacting their engagement. A greater proportion of relationships within participants' *SIPsmartER* social networks (i.e., participants with higher network densities) was associated with greater engagement in classes, total activities, and retention, and participants identified their relationships with other participants had a positive impact on their enrollment and behavior change. However, these findings are limited by the small sample size of the study population and the large enrollment of a worksite with a high density and high engagement. The findings and limitations paired with the enrolling with others and social network literature suggest the need for exploration with a larger study population to better understand the impact on reach, engagement, retention, and behavior change in behavioral interventions targeting individuals from socioeconomically disadvantaged communities.

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Introduction

Research has shown it is difficult to successfully recruit and retain participants in research trials,¹ which contributes to their enrollment in research-based behavioral interventions. Moreover, the level of difficulty increases when working with individuals from socioeconomically disadvantaged communities.² One proposed framework, RE-AIM, stresses the importance of “reach” in the successful adoption and maintenance of learned behaviors.³ A program’s “reach” is defined as “the absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative,” and it has been identified as a critical step in determining the larger dissemination of programs.^{3,4} It is likely that succeeding parts of the framework will be compromised if there is an absence of successful and effective “reach” strategies. Thus, in order to improve the “reach” of community-based behavioral interventions and engage individuals from socioeconomically disadvantaged communities in improving their health, it is important to identify barriers to participation and find ways to reduce these barriers.

One socioeconomically disadvantaged community lies in the Appalachian region of the United States. This region consists of 12 states and all of West Virginia, and stretches from northern Mississippi to southern New York.⁵ It is characterized as being a geographically isolated region burdened by a prevalence of economic, educational, and health disparities.⁶ These factors have likely been influential in the successful recruitment, retention, and engagement of this population in behavioral interventions. In order to improve the health of individuals in this region, it is vital to uncover their barriers to participating in health interventions and determine effective strategies to overcome these barriers.

This literature review has been focused on: 1) the importance of identifying the barriers Appalachians encounter that prevent health behavior intervention participation and health behavior change; 2) recognizing how the strengths of this population could promote participation and behavior change; 3) describing previously used solutions to address recruitment, retention, and engagement barriers; 4) connecting social network strength to Appalachian culture as an avenue to promote behavior change; and 5) determining how social contacts can lessen perceived barriers to joining a health behavior intervention. A particular focus of this thesis research is to explore how social networks⁷ and an “enrolling with others” strategy⁸ may influence recruitment, retention, engagement and behavior change outcomes in a behavioral intervention targeting Appalachian adults.

Literature Review

Importance of Identifying Barriers and Developing Solutions for Disadvantaged Populations

Individuals from socioeconomically disadvantaged communities, such as those in Appalachian regions of the United States, often experience an array of educational, economic, and health disparities, which are likely associated with their “geographically isolated” location.⁶ Medically underserved regions, like Appalachia, have scarce health care within the vicinity, and individuals often experience difficulty in finding affordable health care.^{9,10} The need to travel long distances to receive health care has been associated with lower utilization of health care among rural communities.¹¹ Adding to this, “only 23 percent of the working age population in Appalachia had a bachelor’s degree or more” in 2010, while “13 percent of working-age adults in central Appalachia had a bachelor’s degree.”⁵ Socio-economic status (SES) is also lower for Appalachian communities when compared to other communities in the nation.¹⁰ Likely as a result of the accumulation of these factors, there are higher rates of otherwise-preventable

disparities, such as obesity, diabetes, cancer, and heart disease, resulting in a prevalence of early mortality among Appalachians.^{6,10,12}

In addition to Appalachians, males have also been identified as a population that is difficult to engage in health behavior interventions, and they generally have a greater prevalence of health disparities than females.¹³ For instance, according to the CDC's Morbidity and Mortality Weekly Report, men are more likely to consume greater amounts of sugar-sweetened beverages (SSBs) than women, which could ultimately contribute to an increased risk of developing obesity, type 2 diabetes, and heart disease.¹⁴

Known Barriers to Participation

There are multiple known barriers that prevent successful recruitment,¹⁵⁻¹⁷ retention,¹⁷ and engagement of participants in health interventions.¹⁸ Throughout this literature review: recruitment will be defined as obtaining interest from eligible individuals to participate in a research study, retention will be defined as participants staying active in the intervention from baseline to program conclusion, and engagement will be defined as a participants' attendance in program activities. After a review of the literature on barriers to participating in health behavior interventions, it was found that most studies have focused on barriers to successful recruitment of participants in research studies.^{15-17,19} These are important to identify because recruitment barriers may ultimately impact the potential reach of the program. However, these barriers to recruitment may also be related to those of participant engagement and retention, as the barriers may hinder participants' abilities to attend every program meeting and remain in the program from beginning to end. For instance, commonly identified barriers to recruitment include: transportation,^{15,17} schedule of the program,^{18,19} limited income,¹⁵ participants' personal schedules,¹⁸ and an overall fear of participation in research.^{16,17,19} These barriers may also be

present for participants following enrollment. Therefore, it can be postulated that recruitment barriers may also influence retention and engagement.

Behavior Change Barriers and Motivators in Appalachian and Male Populations

Building upon the aforementioned barriers of low education, low SES, and limited health care access, there are cultural and geographical barriers present within Appalachian communities that can hinder a positive environment for behavior change. For instance, literature suggests that among Appalachians, there is a strong fatalistic outlook—the idea that all occurrences in life, including those relating to health, are predetermined and out of one’s control.^{10,20} Moreover, there is suspicion surrounding the use of health care and an overall distrust of medical professionals.^{6,10,21} Limited transportation is also common due to lower income levels and inadequate public transportation in rural areas.^{11,22} Thus, encouraging rural community members to take part in community health programs (recruitment), attend group meetings (engagement), and stay in a health program from baseline to conclusion (retention) is difficult.

Rivaling these barriers to behavior change in Appalachian populations are many core values that can foster a positive behavior change environment. For instance, literature recognizes that Appalachians typically embody a “strong sense of community,”¹⁰ and they have close support from family.^{10,23} This population also characteristically has a strong work ethic.¹⁰ These strong support systems along with a resilient work ethic can potentially promote behavior change within Appalachian communities.

Male populations also encounter barriers to participating in health behavior interventions, but the low representation of men is not fully understood.²⁴ Pagoto and colleagues²⁴ found this representation can be traced back to a low level of motivation to change health behaviors. Moreover, it is believed that men view health care more as a cure rather than a preventive

measure,²⁵ so they are not likely to seek health care early or attend health screenings. Building on this, men often do not utilize outside help to make a behavior change²⁴ or participate in health-promoting activities,¹³ which ultimately would prevent them from joining a health intervention focused on behavior change. For example, there is often a low representation of men in health programs,²⁴ such as seen in Talking Health (23% males), a behavioral intervention targeting SSB consumption.²⁶

Though there are barriers to behavior change in male populations, there are also motivators that can promote behavior change. According to Norcross and colleagues,²⁷ men are more likely to seek health care when influenced by their female friends, partners, and family members. Moreover, one study has shown there is greater representation of men at health screenings when providers communicate with the man's spouse.²⁸ These supportive, influencing relationships may ultimately help to promote behavior change among male populations.

Previously Used Solutions to Address Recruitment, Retention, and Engagement Barriers

Identifying the direct benefits of participating in a health behavior intervention is often not enough to encourage individuals to participate. For this reason, numerous strategies have been developed to increase participation in research-based health interventions. These include but are not limited to: reducing frequency and duration of programs,²⁹ providing multiple program days and times,^{19,29} incentivizing with gifts or childcare,^{19,30-32} providing transportation,^{30,31} utilizing a central meeting location,²⁹ and mobilizing community partnerships with organizations and health systems.^{19,33}

One recruitment strategy that is becoming more frequent in dissemination and implementation trials is lifting the restriction of enrolling as an individual, and letting potential participants enroll with friends and family members.⁸ However, according to Diamond and

colleagues,⁸ the effect of “enrolling with others” on participants’ program adherence and behavior change still needs to be studied. Studying this strategy through efficacy and effectiveness trials is not possible due to the randomization that often occurs at an individual level to ensure the intervention is effective. However, in dissemination and implementation trials, there is greater focus on reaching a larger sample, and this can be investigated through using the ‘enrolling with others’ strategy.

Enrolling with others has shown to largely contribute to recruitment in previous studies.^{34,34,35} For instance, in one study,³⁵ 46% of participants were recruited through word-of-mouth, where a recruited individual simply tells another individual about the behavioral study. A separate study suggested this recruitment strategy can encourage enrollment through establishing “trust and credibility” of the intervention, as well as emphasizing perceived benefits and minimizing perceived costs to joining.³⁶ As suggested by the enrolling with others literature, enrolling in a health behavior intervention with others who can provide social support may lead to greater retention.³⁷ In addition to increasing retention, enrolling with others has also been associated with increased participant engagement in a health behavior intervention. In a study by Diamond and colleagues,⁸ participants who enrolled with two or three other people had significantly greater attendance in the program (63% of sessions) than those who enrolled with one person (48% of sessions) and those who enrolled alone (41% of sessions) ($p=0.038$). Another study found that individuals who enrolled with others had greater improvements in outcomes than those who enrolled alone.³⁸ It can be postulated that improving recruitment, retention, and engagement with an enrolling with others strategy may ultimately lead to greater behavior change outcomes.

Some previous health behavior intervention research studies that have examined the effect of ‘enrolling with others’ on recruitment, retention, engagement, and/or outcomes have focused on manipulation of group networks and group-based interventions to determine the effect of these manipulations on studied variables.^{31,37,39} Other studies have focused on the relationship between spousal pairs and behavior change.^{40,41} However, few studies have specifically assessed these variables when participants enrolled with others (not restricted to specific relationships) and did not experience intervention manipulation, as would occur in a pragmatic environment.^{8,38} Of those that have assessed the effect, no known studies to date have assessed the role of enrolling with others in the recruitment, retention, engagement, and outcomes of Appalachian and male participants in a sugar-sweetened beverage community-based health behavior intervention.

Social Networks, Appalachian Culture, and the Relation to Health Behavior Change

A social network is defined as a “measure [of] the presence or absence of friendships and task- or work-oriented relationships (which may or may not provide support).”³¹ Social networks have been identified as an opportunity of affecting health through the dispersion of positive and negative health behaviors.⁷

Each individual within the social network is symbolized with a knot. The individual relationships within the social network are referred to as ‘social ties,’ and those who are ‘tied’ to one another are considered ‘social contacts.’³¹ A previous study has shown there is an association between the number of social contacts participants enroll with and their program retention and health outcomes.³⁷

In addition to the quantity of social ties within a network, tie strength is also important. A prevalence of strong ties within a network, such as close relationships with friends or family

members, can promote the diffusion of ideas and behaviors throughout the network.³¹ Weak ties, such as solely classifying someone as an acquaintance, coworker, or neighbor, can bring newer thoughts and opinions into the network.³¹

Density has been identified as another factor of social networks that contributes to the spread of “health information and behaviors,”³⁹ and it is measured as a proportion of one’s network ties to all ties possible within that network. Studies have shown that individuals with many ties (those with a higher network density) typically learn behaviors sooner than individuals with fewer ties (those with a lower network density).³⁹ Networks with a low density (less than .15 ties/total ties in network) have fewer avenues for the spread of “health information and behaviors,”³⁹ while networks with a high density (greater than .50 ties/total ties in network) can hinder behavior change.^{42,43} Thus, according to Valente and colleagues, the optimal density for social networks lies between .15 and .50 ties/total ties in network,⁴³ and this interconnectedness promotes the rapid spread of “health information and behaviors.”³⁹

As explained previously, Appalachian populations hold strong core values that may promote health behavior change.^{10,23} In addition to the population’s strong work ethic, they characteristically have many strong social ties to their community and family.^{10,23} Utilizing these assets in health behavior interventions can ultimately promote a positive behavior change environment for Appalachian participants.

Enrolling with Others, Engagement, and Role in Perceived Barriers

One’s perception of barriers is recognized as being a prominent contributor to participation in health behavior programming and health behavior change.⁴⁴ These barriers can include personal factors, such as income and education, and environmental barriers, such as family or work.¹⁸ In one study, it was found that participants who had high attendance in the

health behavior intervention perceived significantly fewer barriers to participation than participants who had low attendance.¹⁸

Health behavior social network literature suggests that enrolling with others can provide support by simply being in the intervention and working towards the same health behavior goal, as well as through provision of social support.⁷ The presence of this support has been associated with greater attendance and retention of individuals in health behavior change interventions.^{37,38} Therefore, this social support may ultimately transcend to fewer perceived barriers to joining the behavioral intervention. Participants who enroll alone, however, have exhibited lower attendance and retention in health behavior interventions.^{37,38} This is likely due to the absence of support and motivation to stay active in the program. As a result, suggested by research from Gatewood et al,¹⁸ Wing et al,³⁷ and Carson et al,³⁸ the participants who enroll alone may perceive a greater number of barriers to joining the intervention due to their lower attendance.

Therefore, it can be concluded that enrolling with others in health behavior interventions has the potential to increase support for the individual, resulting in increased attendance and fewer perceived barriers to joining the intervention.

Advice Networks and Behavior Change

Advice networks, consisting of individuals who participants would go to for advice when making a health behavior change, are another type of social network that can potentially influence health behavior change.³⁹ These networks may include individuals both within and outside of the health behavior change intervention, and they are expected to consist of “stronger personal ties”³⁹ since they are not restricted to only those individuals within the intervention’s group setting.³⁹

Since asking for advice contributes to an individual's decision making, these advice networks may provide an individual with social support in the sense of appraisal support, or support in making decisions.⁷ In a previous study, participants' advice networks were restricted to those within the intervention group who participants would go to outside of class.³⁹ However, support from family and friends when making a health behavior change has been related to positive behavior change outcomes for participants,³⁷ and these are individuals who could potentially be identified in advice networks, provided the participants are identifying "stronger personal ties."³⁹ Thus, it is likely that the presence of family and friends in advice networks both inside and outside of the study's sample may be related to positive behavior change outcomes.

Addressing Current Gaps in the Enrolling with Others Literature

This study aims to address gaps that have been identified after a review of the enrolling with others and social network literature. Participants' referral efforts (operationalized as 'enrolling with others') has been helpful in recruiting individuals who are difficult to engage,³⁵ but this strategy needs to be explored with Appalachian and male populations, specifically. Additionally, little research has been conducted to determine the effect of enrolling with others on adherence to the program (engagement and retention) and behavior change when participants enrolled with a natural social contact without treatment manipulation,^{8,38} as would occur in the implementation of a health behavior intervention into practice. Moreover, the presence of strong social ties within a network,³¹ identified as 'very close' ties by Carson and colleagues,³⁸ has been associated with behavior change in a previous study,³¹ but with individuals from socioeconomically disadvantaged, barrier-laden Appalachian populations,^{6,10,11,21,22} the relationship between strong social ties and behavior change still needs to be explored. Additionally, literature on behavioral interventions suggests there is a relationship between

attendance and perceived barriers¹⁸ and a relationship between enrolling with others and attendance,^{37,38} but the relationship between enrolling with others and perceived barriers to joining the intervention should be explored. This may provide insight into health behavior change and participation in health behavior interventions and programs, given that perception of barriers is a prominent contributor.⁴⁴ Literature suggests that support from family and friends when making a health behavior change can be related to positive outcomes.³⁷ Family and friends are often identified as being stronger ties, and are thus often included in advice networks.³⁷ However, it is not clear whether it is the quantity of these relationships or simply the presence that aids in behavior change. Valente and colleagues⁴³ have also proposed that networks within a density range of .15 to .50 ties/total ties in network experience an optimal spread of “health information and behaviors,”³⁹ but this has not been tested in a SSB intervention targeting Appalachian participants.

Study Objectives & Hypotheses

To address identified gaps in the literature, this study aims to:

- (1) Describe the reach of SIP*smart*ER as a subset of the total southwest Virginia Appalachian population
 - a. Hypothesis 1a: The participants enrolled will be representative of the individuals in the U.S. census data for southwest Virginia.
 - b. Hypothesis 1b: The participants enrolled will be representative of the individuals who were screened and eligible but not enrolled.
 - c. Hypothesis 1c: The proportion of those who are enrolled will be similar to that of the SIP*smart*ER effectiveness trial, Talking Health, yet the representation of males will be greater than in Talking Health.

- (2) Determine if enrolling with others influences engagement, retention, and behavior change in *SIPsmartER*
- a. Hypothesis: Compared to those who enroll alone, enrolling with others will increase engagement, retention, and improvements in SSB outcomes in *SIPsmartER*.
- (3) Explore participants' 'very close' relationships within their cohort in relation to participants' engagement, retention, and behavior change in *SIPsmartER*
- a. Hypothesis: Participants with greater 'very close' relationships with participants in their cohort at baseline will have greater engagement, retention, and improvements in SSB outcomes in *SIPsmartER*.
- (4) Determine if participants' family and friend support within their advice network and their network density influences engagement, retention, and behavior change in *SIPsmartER*
- a. Hypothesis: Participants with more support from family and friends within their advice network will have greater engagement, retention, and improvements in SSB outcomes.
- (5) Determine if participant and average cohort network density influences engagement, retention, and behavior change in *SIPsmartER*
- a. Hypothesis: Participants and cohorts with an optimal network density will have greater engagement, retention, and improvements in SSB outcomes.
- (6) Describe and explain perceived barriers to enrollment and participation in *SIPsmartER* in relation to participants' enrollment with others
- a. Hypothesis: When compared to those who enroll alone, there may be differences in barriers among participants who enroll with others.

Methodology

SIPsmartER

SIPsmartER is an effective health behavior intervention targeting sugar-sweetened beverage (SSB) consumption among Appalachian adults in southwest Virginia.⁴⁵ Talking Health, a type 1 effectiveness-implementation randomized control trial, showed that participants enrolled in the treatment condition, *SIPsmartER*, significantly decreased their baseline SSB intake by 227 kilocalories (kcal)/day when compared to the physical activity control condition, MoveMore.⁴⁵ The *SIPsmartER* intervention consists of three, two-hour long small group classes taught by a health educator at a central community location, one live teach-back phone call administered by a *SIPsmartER* researcher, 11 IVR phone calls, and two health screenings administered by *SIPsmartER* researchers, which are spread throughout a six-month period. If a participant missed a small group class, he or she received a package containing the lesson's worksheets, a video presentation of the lesson's PowerPoint slides, and a phone call from a research assistant to review the material from the class. The classes and phone calls consisted of learning about the harms of SSBs, how the media influences perception of SSBs, and the monetary and health costs of SSBs. Throughout the program, participants were responsible for tracking their personal SSB consumption with a drink diary.

Purpose of NIH R21 and VDH Partnership

The *SIPsmartER* implementation trial is funded by an R21 mechanism through the National Institutes of Health (NIH). The purpose of this trial is to determine the feasibility of wide-scale adoption of the sugar-sweetened beverage intervention by Virginia Department of Health (VDH). In addition to the long-term goal of disseminating *SIPsmartER* throughout Virginia, VDH staff also played a vital role in recruiting individuals to participate and taught the

curriculum to participants in their respective counties. The SIP^{smart}ER implementation strategy for the VDH staff included 1) a 2-day group training that incorporated didactic and application activities and a facilitators' manual and 2) technical assistance and program support provided via one-on-one telephone meetings. Using standardized checklists, program fidelity of the small group classes was assessed by researcher observation and self-rated by VDH staff.

Ethical Considerations

Participant information is confidential. Each participant was assigned a screener ID number, enrolled participant ID number, and social networking questionnaire ID number. Participants signed an informed consent form at the baseline health screening and prior to data collection to educate participants on the data uses of the study, expectations, and possible risks and benefits of participation. University of Virginia's Institutional Review Board approved the study design and all materials used for the study.

Eligibility and Recruitment Strategy

Screening Phase 1: Role of VDH Staff

Participants were recruited in four VDH health district regions in southwest Virginia: Cumberland Plateau, Lenowisco, Mount Rogers, and New River. Health educators from each of the four health districts recruited individuals by targeting pre-formed and unformed groups in their local health department, nearby worksites, and housing developments through use of active, in-person recruiting and fliers. Adults were asked to fill out the eligibility screening survey, which consisted of questions about their sugary drink consumption [i.e., two questions from the Behavioral Risk Factor Surveillance System (BRFSS)],⁴⁶ literacy, and demographic information. To be considered eligible for enrollment, participants must have met the following criteria: 18 years of age or older, consume greater than or equal to 200 kcal of SSB/day, and could attend the

baseline health screening. A brochure was provided to potential participants with facts about the health of southwest Virginia and how SIP*smart*ER could help them take control of their health.

Screening Phase 2: Role of University of Virginia Researchers

Eligibility was then determined based on the BRFSS SSB consumption estimate and provided contact information. Based on the SSB information, participants were categorized as being ‘eligible,’ ‘maybe eligible,’ or ‘not eligible’ (see additional details in measures section). The ‘eligible’ individuals were contacted by phone and mail to provide them with more information on SIP*smart*ER and determine interest. The ‘maybe eligible’ individuals were also contacted by phone and mail to provide more information on SIP*smart*ER, and if there was interest, the potential participants completed an adapted BEVQ-15 questionnaire⁴⁷ with a SIP*smart*ER researcher to provide more precise estimates on SSB consumption. At the end of the phone call, research assistants asked participants if they had any friends or family members who would also like to join SIP*smart*ER. The research assistants focused on asking a male to join when recruiting participants. This intent of this focus was to increase the representation of males involved in the SIP*smart*ER program. These prompts were used to emphasize the ‘enrolling with others’ recruitment strategy. If a participant was successfully recruited through this strategy, the participants involved were identified as enrolling with others. These results were later followed up with recruitment field notes through the social networking questionnaire (see additional details below in measures section). An example of the calling script that guided this recruitment strategy is included in Appendix B.

Enrollment, Engagement, and Retention

Screening was conducted through a paper survey and over the phone, if needed, to determine eligibility of potential participants based on SSB consumption, age, and provided

contacted information, in addition to gathering demographic information. Interested, eligible participants were enrolled following completion of the baseline health screening. Engagement and retention were tracked throughout the six months based on participants' attendance (see additional details in measures section).

Measures

SSB Eligibility

Questions adapted from BRFSS⁴⁶ were used to assess sugary drink behavior among participants for screening purposes through use of a paper survey. Participants were asked, "During the past 30 days, how often did you drink regular soda or pop that contains sugar? *Do not include diet soda or diet pop.* Select only one and fill in number."⁴⁶ Participants then checked a box to select their frequency ("___ Times per day," "___ Times per week," "___ Times per month," "Never"), and wrote on the line the number of times per day, per week, or per month they consumed regular soda. The next question asked participants, "During the past 30 days, how often did you drink sugar-sweetened fruit drinks (such as Kool-aidTM and lemonade), sweet tea, and sports or energy drinks (such as GatoradeTM and Red BullTM)? *Do not include 100% fruit juice, diet drinks, or artificially sweetened drinks.* Select only one and fill in number."⁴⁶ Similar to the previous question, participants checked a box to select their frequency and wrote in a number based on the number of times per day, per week, or per month they consumed sugar-sweetened fruit drinks. If the sum of these responses equaled out to being less than 200 kcal per day, the individual was categorized as being 'not eligible' to participate. If this amount equaled out to being more than 200 kcal per day, however, the individual was categorized as being 'definitely eligible' based on SSB intake, and further eligibility was determined by age and contact information provided. If the given responses were incomplete or needed further

assessment, the individual was categorized as being ‘maybe eligible’ based on SSB intake, and if eligibility was determined by age and contact information provided, the individual was contacted to determine SSB eligibility. An example of the screener is included in Appendix A.

For individuals who were flagged as ‘maybe eligible,’ a SIP*smart*ER researcher administered a follow-up screener over the phone to determine eligibility. The potential participants were asked more precise questions about their sugary drink behaviors from an adapted version of the BEVQ-15 questionnaire,⁴⁷ and in addition to providing information on the frequency of consumption, the participants provided their typical serving size for that beverage. For example, participants were asked a frequency question such as, “How often do you drink sweetened juice beverages/drinks (such as fruit aides, lemonade, punch, or Sunny Delight)?” by a researcher, and responded with their per-week or per-day frequency.⁴⁷ The frequency per month was not recorded; instead, if participants responded with a frequency of less than one time per week, their consumption of that beverage was categorized as “Never or less than 1 time per week” for screening purposes. If the participant responded with a per-week or per-day frequency, they were then asked a follow-up question such as, “When you drink sweetened juice beverages/drink, how much do you normally drink?”⁴⁷ Participants could respond with “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).” As the researcher asked these questions, they also filled out a BEVQ calculator with the SSB choice, frequency, and serving size in order to calculate the average daily number of kcal that were coming from the participant’s total consumption of SSBs. This process was repeated for other sugary drinks, including regular soft drinks, sweetened tea, tea or coffee with added cream (sweetened) and/or sugar, and energy and sports drinks.⁴⁷ A total number of SSB kcal was calculated by the researcher, and eligibility was determined if the

participant consumed more than 200 kcal/day. An example of the screener is included in Appendix B.

Age, Eligibility, and Interest in SIP*smart*ER

Further screening was measured for those who were categorized as being ‘maybe eligible’ or ‘definitely eligible’ in relation to SSB intake. If the participant was at least 18 years of age, he or she met the minimum eligible age to participate. Participants were also asked, “Would you like to learn more about SIP*smart*ER, a Virginia Department of Health program that helps decrease sugary drinks?” If the participant marked “No,” and they did not provide any contact information, he or she was not contacted for further recruitment. However, if the participant marked “No,” but provided contact information and was eligible in terms of SSB consumption and age, the participant was contacted for further recruitment. If the participant marked “Yes; please provide your contact information below,” he or she was also contacted for further recruitment.

Demographics

In addition to screening for eligibility, the intake survey collected demographic information on the screened participants. Participants were asked about their gender, age, ethnicity, and the highest grade of school they completed. Information was collected on household income at the 6-month health screening for the 5 cohorts who have completed the study and at the baseline health screening for the remaining cohorts. This information was then measured to test Hypotheses 1a, 1b, and 1c. Eligible and enrolled participants were categorized into groups based on their responses to these demographic questions. An example of the intake survey is included in Appendix A.

Reach

Comparisons were made between the *SIPsmartER* enrolled participant sample and 1) census estimates, 2) participants who were eligible but did not enroll, and 3) the Talking Health participant sample. Southwest Virginia reach data was gathered from the United States Census Bureau American Community Survey 2015.⁴⁸ This data was originally gathered through randomly surveying 3.5 million U.S. addresses to participate.⁴⁹ This information then provides yearly updates of the estimates from the 2010 census, and it is available for public use online. The reach data was determined for the 10 southwest Virginia cities and counties represented in the study population: Bland, Giles, Grayson, Montgomery, Radford, Russell, Scott, Tazewell, Wise, and Wythe. Data was gathered on age groups, household income, educational attainment, sex, and race. The *SIPsmartER* study sample data was then descriptively compared to the data gathered from American Community Survey 2015.

The *SIPsmartER* enrolled participant sample was also compared to the sample of individuals screened and eligible for *SIPsmartER* but chose not to enroll. Chi-square and one-way ANOVA tests were used for this analysis to determine representativeness of the enrolled participant sample when compared to the sample of individuals screened and eligible for enrollment.

The *SIPsmartER* study sample was also compared to that of the effectiveness trial for *SIPsmartER*, Talking Health.⁵⁰ Talking Health was representative of the southwest Virginia population, though there was a low enrollment of men.²⁶ Descriptively comparing *SIPsmartER* to Talking Health will help to draw conclusions about the *SIPsmartER* study population, and determine if there was a greater enrollment of men with using an ‘enrolling with others’ strategy.

Engagement

Engagement was measured based on the individual's participation in SIP*smart*ER activities, including classes, IVR calls and a teach-back call. Each of the three group classes attended (or missed class calls completed) scored a 1, with a total of 3 for this section of participation. Missed class call (MCC) engagement was calculated as a proportion out of the total number of MCC the participant was eligible to complete. Each of the 11 IVR calls and 1 teach-back call completed scored a 1, with a total of 12 for this section of participation. The sum of the total for all activities categorized as 'engagement' total 15. For each of the individual engagement activities a participant did not complete, he or she scored a 0 for that single activity. Proportions of completed classes, phone calls, and total activities were then calculated for Hypotheses 2 and 4b.

Retention

Retention was measured as completing the 6-month health screening. Completing the 6-month health screening was scored as a 1, while those who dropped out of the program or did not show for the health screening were scored as a 0, as these individuals did not complete the program from beginning to end. This retention score was also calculated as a proportion for Hypotheses 2 and 4b by taking the number of participants retained in the cohort out of the total number of participants in the cohort.

Outcome Data

Social Network Questionnaire

A social network questionnaire was adapted from questionnaires developed by Gesell and colleagues^{31,39} and Carson and colleagues³⁸ for use in determining the social relationships within behavioral intervention groups. A sample of the social network questionnaire is provided in

Appendix C. At the baseline health screening, a *SIPsmartER* researcher sat with each participant to administer the questions.

Part 1 of the questionnaire asked participants about their relationships to others in their *SIPsmartER* cohort. The researcher began by stating a person's name within the cohort, and the participant would respond to the question, "What is your relationship to this person?" to determine the number of people the participant enrolled with.³¹ If the participant knew the person, they continued by answering, "If a family member, what is your relationship to this person?" to determine if the family member was a spouse or other relative. Following that question, the research assistant asked the participant, "How close would you rate your relationship with this person?" to determine the strength of the social tie.³⁸ Asking, "Did you refer this person to *SIPsmartER* or did they refer you to *SIPsmartER*?" provided information on whether the participant's relationship influenced his or her enrollment in *SIPsmartER*.³⁸ The participants were provided with a table card that had the multiple-choice responses for each question. If the participant did not know the person, he or she skipped the remaining questions for that person and continued by moving on to the next person. This process was repeated with each participant to determine their connectedness to others within their cohort.

The first item in Part 1 of the questionnaire was measured to test Hypothesis 5 on network densities. To test this, the presence or absence of possible social ties within the cohort was measured. If a participant responded, "Stranger/do not know them," to all of the people within his or her cohort, the response for that participant was measured as a 0. If a participant responded with any of the remaining responses, excluding "Self," for any person within the cohort, the response was measured as a 1. Density was then determined through taking the total

number of relationships one participant had and calculating its proportion to all relationships possible within the participant's cohort.⁵¹

The next set of items in Part 1 of the questionnaire asked participants about the closeness of their relationships for those who provided a response other than "Self" and "Stranger/do not know them" for the previous question.³⁸ The participant scored a 1 for each 'very close' response provided. For each individual who was classified as 'not close' or 'somewhat close,' the participant scored a 0. A sum was then determined for each participant based on the number of 'very close' relationships the participant identified, and this information was then used to test Hypothesis 3 on 'very close' relationships.

The final set of items in Part 1 of the questionnaire asked participants whether they referred the individual or if the individual referred them to join *SIPsmartER*. For each participant who responded, "Yes, they referred me" and "Yes, I referred them," the participant scored a 1. For each participant who responded, "No," the participant scored a 0. Additional referral data was factored in from recruitment field notes to capture all possible referrals. A sum was then gathered from this data, and any sum greater than 0 classified the participant as 'enrolled with others.' This information was then used to test Hypotheses 2 and 6 on enrollment with others.

Part 2 of the social networking questionnaire asked questions pertaining to the participant's personal social network. A *SIPsmartER* researcher delivered the questionnaire, asking the participant, "Who would you go to for advice on making healthier lifestyle choices, like drinking sugary drinks?" to determine the participant's personal advice network.^{39,51,52} Participants were then asked, "What is your relationship to this person?" to determine if family and friends were a source of support for advice throughout the program.³¹ The participant scored a 1 for each friend or family member identified in his or her advice network. For all remaining

responses, the participant scored a 0. A sum was then gathered based on the number of friends and family members provided. Participants were then categorized into groups based on the sum of their family and friend ties within their advice networks. The items in Part 2 of the questionnaire were then used to measure Hypothesis 4 on family and friends in advice networks.

SSB Outcomes

SSB data used for outcome measures were gathered at the baseline and 6-month health screenings through use of a computer-based BEVQ-15 questionnaire.^{47,53} The participant completed the questionnaire alone, and he or she had the option to complete the BEVQ-15 questionnaire by listening to the instructions through audio or reading the instructions individually. The questionnaire required low computer literacy skills to complete, and if requested, a *SIPsmartER* research assistant would provide help. In order to find the total amount of SSB kcals reduced, the baseline SSB kcals was subtracted from the 6-month SSB kcals.

Summative Evaluation: Perceived Barriers

The summative evaluation was a paper survey administered by *SIPsmartER* researchers to participants at the 6-month health screening. A portion of this summative evaluation consisted of questions asking about participants' perceived barriers to joining *SIPsmartER* and the effect of participating in *SIPsmartER* with or without others. *SIPsmartER* research staff with basic training in conducting interviews and recording responses interviewed each participant. *SIPsmartER* researchers were exempt from completing interviews with a participant if they had previously met that participant in a *SIPsmartER* group class. In the format of a structured one-on-one interview, a *SIPsmartER* researcher asked participants the following questions: "Did (not) having relationships with other people before starting *SIPsmartER* impact how you made these changes and overcame your barriers to reach your goals? *Probe*: Why or why not? How?"

“Thinking back to your own experience, what concerns or thoughts did you have when you first signed up for SIP*smart*ER and came to the first health screening? *Prompts*: Did (not) knowing someone in the group affect what you think?” “Thinking back to your own experience, how did knowing (or not knowing) someone in the group affect your attending classes? Your completing the automated calls?” “Please tell me about any barriers (obstacles) that made attending the classes hard for you,” and “Please tell me about any barriers (or obstacles) that may have made completing the phone calls difficult for you.” Asking these questions provided the researchers with insight on participants’ perceptions of barriers to enrollment and participation, and the impact enrolling with others or knowing someone in the group impacted these perceived barriers. Participants responded to these questions in their own words, and there was not a limit on the number of responses a participant provided. As the participant responded to the question, the researcher recorded the participants’ responses. The participants’ original responses were explored through qualitative means (see *Qualitative Analysis* section for more details). A sample of the summative evaluation is provided in Appendix D.

Data Analysis

The analyses of all data gathered during this study were completed using IBM SPSS statistical software. To analyze Hypothesis 1b on reach and representativeness of the enrolled participant sample, Chi square and one-way ANOVA tests were used in order to determine the representativeness of the SIP*smart*ER study sample for the first round of five cohorts when compared the total number screened and eligible for enrollment. To test Hypotheses 1a and 1c on the SIP*smart*ER study population compared to census estimates for southwest Virginia and the Talking Health study population, descriptive and narrative comparisons were used to determine the similarities and differences between the reach of the SIP*smart*ER study population when

compared to the sample's larger population in southwest Virginia and the Talking Health study population.

To test Hypothesis 2 on enrollment with others, the proportions of each participant's engagement in (1) classes, (2) MCC (if eligible), (3) phone calls (IVR and teach-back calls), and (4) total activities (classes, MCC, IVR and teach-back calls) were determined for two groups—those who enrolled with others and those who enrolled alone. Then, the means were determined for each engagement category for participants who enrolled with others and participants who enrolled alone. A one-way ANOVA test was used to determine the differences in engagement when individuals enroll with others versus alone. One-way ANOVA tests were also used to assess between group difference (enroll with others vs. enroll alone) for SSB outcomes and the proportion of participants retained.

To measure Hypothesis 3 on 'very close' social ties, a correlation test was used to determine the relationship between engagement and participants' 'very close' social ties within their cohorts. A correlation test was also used to determine the relationship between participants' SSB outcomes and their 'very close' social ties. A one-way ANOVA test was used to measure the differences in 'very close' social ties among participants who were retained in SIP*smart*ER and those who were not.

To measure Hypothesis 4 on advice network ties, a correlation test was used to measure the relationship between participants' engagement and family and friends in their advice networks. A correlation test was used to measure the relationship between family and friends in advice networks and SSB outcomes. A one-way ANOVA test was used to measure the differences in family and friends identified in their advice networks among participants who were retained in SIP*smart*ER and those who were not.

To measure Hypothesis 5 on participant and average cohort network densities, network density was explored as both a continuous and categorical variable using cut-points defined in the literature.⁴³ First, a correlation test was used to measure the relationship between participants' engagement in SIP*smart*ER classes and their network densities. A correlation test was also used to measure the relationship between participants' SSB outcomes and the densities of SIP*smart*ER participants' networks within group classes. A one-way ANOVA test was used to measure the differences in the participants' network densities among participants' who were retained in SIP*smart*ER and those who were not. Second, one-way ANOVA tests were used to analyze participants' engagement, SSB outcomes, and retention with categorical network densities of low (<.15 ties/total ties possible), optimal (.15 to .50 ties/total ties possible), and high density (> .50 ties/total ties possible), as defined by Valente and colleagues.⁴³ These analyses were also conducted on the level of the cohort by averaging the network densities of each participant in the cohort.

Qualitative Analysis

A conventional content analysis was used to measure Hypothesis 6.⁵⁴ A graduate research assistant trained in basic content analysis conducted the analyses, and an undergraduate research assistant collaborated on the analyses. Participants' original responses to each prompt were be simplified into brief descriptions.⁵⁴ These descriptions were then linked based on common themes to determine codes (or categories) during the analysis.⁵⁴ These coded responses were then reviewed and further simplified based on major and minor themes that emerged. A codebook was compiled based on these themes and previous themes identified in the Talking Health qualitative data, and this was used throughout the analysis to organize and define each developed code. An undergraduate research assistant then followed the same process, determining the codes

that best fit each prompt using the codebook developed by the graduate research assistant. The graduate research assistant then went through the coded responses to determine the discrepancies. The two independent coders then met to resolve discrepancies in coding. The two coders also determined the groups of responses that were relevant to the prompt and those that would be disregarded in the analysis due to only one meaning unit representing the response. The total number of coded responses, or meaning units, then represented the sample size for that prompt. The resulting codes and revised major and minor themes were then used in the analysis. The content was then analyzed at the basic level, describing the responses identified by participants and how that related to either their enrollment with or without others or their relationships to others. This provided the researcher with greater depth in responses when paired with the quantitative analysis, and it ultimately aided in making greater sense of the data collected.⁵⁵

Results

Through the recruitment efforts, 927 individuals were screened for eligibility in *SIPsmartER*, 595 (64%) of these were eligible, and 119 (20% of eligible) enrolled in *SIPsmartER*. The remaining 467 did not enroll either because they were unable to be successfully contacted via phone, did not attend their first health screening appointment, or chose not to join for various reasons (e.g., too much time or work/personal conflict, transportation issues).

Table 1 shows the recruitment strategies used to recruit *SIPsmartER* cohorts, the classification as a pre-formed or unformed group, and the cohort's average network density score to provide additional support on the reach of the *SIPsmartER* study sample. Targeting pre-formed groups, such as housing developments and a worksite, were utilized by recruiters to

improve the number of enrolled participants. These pre-formed groups, as shown in Table 1, often have a greater network density score than unformed groups.

Table 1: Comparison of SIP*smart*ER cohorts, recruitment strategies, and network densities

Cohort Name	Recruitment Strategy	Pre-formed or Unformed	Network Density
1. Tazewell	Public location	Unformed	.15
2. IDC Worksite	Worksite	Pre-formed	.99
3. Wytheville	Previous health program	Pre-formed	.28
4. Radford	Public location	Unformed	.07
5. Whippoorwill	Housing development	Pre-formed	.66
6. Inman Village	Housing development	Pre-formed	.29
7. Dogwood Terrace	Housing development	Pre-formed	.17
8. Clinchview Manor	Housing development	Pre-formed	.62
9. St. Paul Clinchview	Housing development	Pre-formed	.39
10. Christiansburg	Public location	Unformed	.10
11. Linden Green	Housing development	Pre-formed	.51

Table 2 shows the demographic information for enrolled participants as well as U.S. Census Bureau data for southwest Virginia. When compared to the U.S. Census Bureau American Community Survey population estimates for 2015 for the 10 counties representing SIP*smart*ER enrollment in southwest Virginia.⁴⁸ While not inferentially tested, in general, the SIP*smart*ER study sample is underrepresented for men and has a lower median income and educational attainment when compared to the U.S. census data for southwest Virginia. The SIP*smart*ER study sample was similar to the U.S. census data for southwest Virginia for mean age and majority race.

Table 2: Demographic characteristics for enrolled participants compared to U.S. Census Bureau American Community Survey population estimates for 2015 for targeted health districts

Demographic Characteristics	Enrolled Participants n=119	U.S. Census American Community Survey 2015 Estimates for SWVA^{48,a}
Mean Age (Years)^b	41.3 (14.4)	40.2 (8.38)
Sex		
Male	27.7%	50.5%
Female	72.3%	49.5%
Race^c		
White	94.9%	92.1%
Other	5.13%	7.9%
Educational Attainment		
High school or less	59.7%	45.3%
Beyond high school	40.3%	54.7%
Median Income^d	\$12,500	\$34,750

a: The U.S. Census American Community Survey 2015 is an estimate of the population based on updates to the 2010 U.S. Census.⁴⁹ For the 10 counties represented in the SIP*smart*ER study sample, the total population is approximately 317,000 people.⁴⁸

b: n=117 Enrolled Participants

c: n=117 Enrolled Participants

d: The sample size is smaller due to collecting this information at the 6-month health screening for the 2016 cohorts (n=99 Enrolled Participants).

The sample of eligible and enrolled participants was also compared to the total number of participants screened and eligible but not enrolled, as depicted in Table 3. There were significant differences in mean age ($p=.002$) and white race ($p=.048$) in the SIP*smart*ER enrolled participant sample when compared to those eligible and not enrolled. There were not any statistically significant differences in educational attainment and sex of enrolled participants when compared to those eligible and not enrolled. However, there is greater educational attainment of individuals who completed high school or less (59.7% versus 51.9%) and a similar percentage of men (27.7% versus 29.0%) in the SIP*smart*ER enrolled participant sample when compared to those eligible and not enrolled.

Table 3: Demographic characteristics for eligible and enrolled participants compared to the total number of eligible participants (including those who did not enroll)

	Enrolled Participants n=117 Mean (SD)	Eligible and Not Enrolled n=252	ANOVA F-test (p-value)
Mean Age (Years)	41.3 (14.4)	36.2 (15.1)	9.52 (.002)

	Enrolled Participants n=119	Eligible and Not Enrolled n=262	Chi-square (p-value)
Sex	27.7%	29.0%	.065 (.798)
Male	72.3%	71.0%	
Race^a	94.9%	88.3%	3.92 (.048)
White	5.13%	11.6%	
Other	59.7%	51.9%	1.98 (.159)
Educational Attainment	40.3%	48.1%	
High school or less			
Beyond high school			

a: n=117 Enrolled Participants, n=258 Eligible and Not Enrolled

Compared to the reach of SIP*smart*ER’s effectiveness trial, Talking Health,²⁶ the number of participants screened for eligibility in SIP*smart*ER was similar (1,056 participants in Talking Health compared to 927 participants in SIP*smart*ER). Further, 595 individuals (64%) of those screened for SIP*smart*ER were eligible for enrollment, while 620 individuals (59%) of those screened for Talking Health were eligible for enrollment. However, SIP*smart*ER enrolled a study population of 119 participants (20% of those eligible for enrollment), whereas Talking Health enrolled a study population of 301 participants (49% of those eligible for enrollment). While not inferentially tested, in general, there were differences among the SIP*smart*ER study sample when compared to the Talking Health study sample. For example, the SIP*smart*ER study sample had a greater enrollment of men (28% versus 23%), white race (95% versus 90%), educational attainment of high school or less (60% versus 50%), and a lower mean income (\$16,919 versus

\$21,981) when compared to the Talking Health study sample. The mean age of SIPsmartER participants (41.3 years [SD=14.4]) was similar to the Talking Health sample (40.1 years [SD=13.5]).

Table 4 illustrates the engagement, SSB outcomes, and retention of SIPsmartER participants when they enrolled with others (n=13) and enrolled alone (n=45). One-way ANOVA tests revealed that those who enrolled alone completed a significantly higher proportion of classes (p=.042), MCC (p=.005), phone calls (p=.001), total activities (p=.001), and had significantly greater retention (p<.001). There were no significant differences in mean reduction of SSB kcals among those who enrolled with others (-636 kcal) when compared to those who enrolled alone (-419 kcal)(p=0.201). While not analyzed statistically, 3 out of the 13 (~23%) who enrolled with others were male, and 17 out of the 45 (~38%) who enrolled alone were male.

Table 4: Participant engagement, SSB outcomes, and retention when enrolled with others and alone

	Overall n=58 Mean (SD)	Enrolled with Others n=13	Enrolled Alone n=45	ANOVA F- test (p-value)
Engagement Proportion of Classes	.546 (.378)	.359 (.396)	.600 (.360)	4.34 (.042)
Proportion of MCC (out of MCC eligible)^a	.512 (.460)	.167 (.235)	.624 (.461)	8.95 (.005)
Proportion of Calls (IVR+TBC)	.575 (.389)	.282 (.402)	.659 (.345)	11.2 (.001)
Proportion of Total Activities (Classes + MCC + Calls)	.612 (.366)	.323 (.381)	.695 (.319)	12.5 (.001)
SSB kcals Outcomes^b	-452 (411)	-636 (336)	-419 (418)	1.69 (.201)
Retention (proportion)	.810 (.165)	.671 (.157)	.851 (.146)	14.8 (.000)

a: The sample size is smaller due to the smaller number of participants who were eligible for MCC (n=41 Overall, n=10 Enrolled with Others, n=31 Enrolled Alone. Fewer participants were eligible for MCC.

b: The sample size is smaller due to the smaller number of participants who completed the 6-month screening (n=45 Overall, n=7 Enrolled with Others, n=38 Enrolled Alone).

Table 5 shows associations of participants’ ‘very close’ social ties and engagement, SSB outcomes, and retention. Participants had an average of 3.88 (SD=6.42) very close social ties (ranging from 0 to 22). Correlation tests revealed there are no significant relationships with the number of very close social ties and the engagement or SSB outcomes (all $p > .05$ level). While not significant, there are trends for greater engagement in MCC ($r = .309$, $p = .056$), phone calls ($r = .245$, $p = .069$), total activities ($r = .258$, $p = .054$), and greater SSB kcal outcomes ($r = .252$, $p = .091$) among participants with greater ‘very close’ social ties. The one-way ANOVA test revealed there are no significant differences in retention.

Table 5: Associations among participants’ ‘very close’ social ties and engagement, SSB outcomes, and retention

	Correlations of ‘Very Close’ Social Ties (p-value)
Engagement # of Classes	.216 (.110)
# of MCC (out of MCC eligible)	.309 (.056)
# of Calls (IVR+TBC)	.245 (.069)
# of Total Activities (Classes + MCC + Calls)	.258 (.054)
SSB kcals Outcomes^a	.252 (.091)

	Number of ‘Very Close’ Social Ties Mean (SD)	ANOVA F-test (p-value)
Retention Yes	4.43 (6.86)	2.20 (.144)
No	1.00 (1.00)	

a: SSB kcals outcomes calculated by subtracting baseline kcals from 6-month kcals

Table 6 illustrates associations of participants’ friends/family members in their advice network and engagement, SSB outcomes, and retention. Participants had an average of .982 (SD=.70) friends/family members in their advice network (ranging from 0 to 3). Correlation tests revealed there are no significant relationships with the number of friends/family members in participants’ advice networks and their engagement or SSB outcomes. Likewise, the one-way ANOVA test revealed there are no significant differences in retention.

Table 6: Associations among participants’ friends/family members in advice network and engagement, SSB outcomes, and retention

	Correlations of Friends/Family Members (p-value)
Engagement	- .008 (.956)
# of Classes	
# of MCC (out of MCC eligible)	.042 (.798)
# of Calls (IVR+TBC)	.012 (.929)
# of Total Activities (Classes + MCC + Calls)	.012 (.930)
SSB kcals Outcomes^a	- .232 (.120)

	Number of Friends/Family Members Mean (SD)	ANOVA F-test (p-value)
Retention	1.00 (.752)	.187 (.667)
Yes		
No	.889 (.333)	

a: SSB kcals outcomes calculated by subtracting baseline kcals from 6-month kcals

Table 7a shows participant’s network densities out of the number of participants scheduled for SIP*smart*ER and engagement, SSB outcomes, and retention. One-way ANOVA tests (and Tukey HSD post-hoc) with categorical network densities—identified as ‘Low’ (L=0-.15), ‘Optimal’ (O=.15-.5), or ‘High’ (H=.5-1)—revealed significant differences in engagement

in classes ($p=.001$, $L<H$, $O<H$) and total activities ($p=.024$, NS), and retention ($p<.001$, $L<H$, $O<H$). While not significant at the $p<.05$ level, there are trends for engagement in phone calls ($p=.054$). Also, there are nonsignificant findings for greater improvements in SSB kcal outcomes among participants with an optimal network density (-603 kcal compared to -517 kcal and -407 kcal for low and high network densities, respectively). There were no significant differences between low, optimal, and high participant network densities for engagement in MCC. When treated as a continuous variable, correlation tests revealed significant positive relationships in engagement in classes ($r=.503$, $p=.000$), MCC ($r=.328$, $p=.042$), phone calls ($r=.353$, $p=.008$), and total activities ($r=.395$, $p=.003$). The one-way ANOVA test revealed significantly greater retention among participants with a higher network density ($p=.020$). The correlation test for SSB kcal outcomes showed no significant relationship.

Table 7a: Participants’ network densities (out of participants scheduled for SIP $_{smart}$ ER) and engagement, SSB outcomes, and retention

	Network Density			ANOVA F-test (p-value)	Post-hoc
	Low < .15 (L) n=13 Mean (SD)	Optimal .15-.5 (O) n=8	High >.5 (H) n=35		
Engagement Proportion of Classes	.333 (.385)	.292 (.375)	.695 (.317)	8.07 (.001)	L<H O<H
Proportion of MCC (out of MCC eligible)^a	.424 (.424)	.428 (.418)	.635 (.482)	1.02 (.371)	N/A
Proportion of Calls (IVR+TBC)	.487 (.380)	.375 (.476)	.686 (.334)	3.08 (.054)	N/A
Proportion of Total Activities (Classes + MCC + Calls)	.508 (.368)	.408 (.457)	.728 (.297)	4.01 (.024)	NS
SSB kcals Outcomes^b	-517 (343)	-603 (327)	-407 (440)	.684 (.510)	N/A
Retention (proportion)	.641 (.106)	.637 (.089)	.928 (.063)	89.3 (.000)	L<H O<H

	Correlations with Network Density (p-value)
Engagement # of Classes	.503 (.000)
# of MCC (out of MCC eligible)	.328 (.042)
# of Calls (IVR+TBC)	.353 (.008)
# of Total Activities (Classes + MCC + Calls)	.395 (.003)
SSB kcals Outcomes^c	.120 (.427)

	Network Density Mean (SD)	ANOVA F-test (p-value)
Retention Yes	.655 (.392)	5.76 (.020)
No	.310 (.408)	

a: The sample size is smaller due to the smaller number of participants who were eligible for MCC ($n=11$ for “Low,” $n=7$ for “Optimal,” $n=21$ for “High”).

b: The sample size is smaller due to the smaller number of participants who completed the 6-month screening ($n=8$ for “Low,” $n=6$ for “Optimal,” $n=31$ for “High”).

c: SSB kcals outcomes calculated by subtracting baseline kcals from 6-month kcals

Table 7b shows average cohort network densities out of the number of participants scheduled for SIP^{smart}ER and engagement, SSB outcomes, and retention. One-way ANOVA tests (with Tukey HSD post-hoc) with categorical network densities—identified as ‘Low’ (L=0-.15), ‘Optimal’ (O=.15-.5), or ‘High’ (H=.5-1)—revealed significant differences in engagement in classes ($p=.003$, L<H), phone calls ($p=.043$, L<H) and total activities ($p=.018$, L<H), and retention ($p<.001$, L<O<H). While not significant, there are trends ($p=.066$) for greater improvements in SSB kcal outcomes for ‘optimal’ average cohort network densities (-715 kcal compared to -422 kcal and -370 kcal for low and high network densities, respectively). There were no significant differences between low, optimal, and high average cohort network densities for engagement in MCC. When treated as a continuous variable, correlation tests revealed

significant positive relationships in engagement in classes ($r=.458$, $p<.001$), MCC ($r=.330$, $p=.040$), phone calls ($r=.333$, $p=.012$), and total activities ($r=.375$, $p=.004$). The one-way ANOVA test revealed significantly greater retention among participants with a higher network density ($p=.034$). The correlation test for SSB kcal outcomes showed no significant relationship.

Table 7b: Average cohort network densities (out of participants scheduled for SIP_{smart}ER) and engagement, SSB outcomes, and retention

	Network Density			ANOVA F-test (p-value)	Post-hoc
	Low 0-.15 (L) n=9 Mean (SD)	Optimal .15-.5 (O) n=14	High .5-1 (H) n=33		
Engagement	.259 (.364)	.429 (.402)	.687 (.322)	6.49 (.003)	L<H
Proportion of Classes					
Proportion of MCC (out of MCC eligible)^a	.292 (.330)	.576 (.449)	.617 (.487)	1.54 (.227)	N/A
Proportion of Calls (IVR+TBC)	.315 (.317)	.601 (.448)	.669 (.337)	3.34 (.043)	L<H
Proportion of Total Activities (Classes + MCC + Calls)	.341 (.310)	.624 (.428)	.713 (.300)	4.32 (.018)	L<H
SSB kcals Outcomes^b	-422 (185)	-715 (419)	-370 (412)	2.89 (.066)	N/A
Retention (proportion)	.545 (.000)	.714 (.067)	.940 (.038)	338 (.000)	L<O<H

	Correlations with Network Density
Engagement # of Classes	.458 (.000)
# of MCC (out of MCC eligible)	.330 (.040)
# of Calls (IVR+TBC)	.333 (.012)
# of Total Activities (Classes + MCC + Calls)	.375 (.004)
SSB kcals Outcomes^c	.170 (.258)

	Network Density Mean (SD)	ANOVA F-test (p-value)
Retention Yes	.646 (.370)	4.71 (.034)
No	.354 (.370)	

a: The sample size is smaller due to the smaller number of participants who were eligible for MCC ($n=8$ for “Low,” $n=11$ for “Optimal,” $n=20$ for “High”).

b: The sample size is smaller due to the smaller number of participants who completed the 6-month screening ($n=6$ for “Low,” $n=10$ for “Optimal,” $n=29$ for “High”).

c: SSB kcals outcomes calculated by subtracting baseline kcals from 6-month kcals

Tables 8a-8j summarize the codes generated for each component, code definitions, a representative meaning unit for each code, and counts of meaning units, including an overall count, an ‘enrolled with others’ count, and an ‘enrolled alone’ count. Across all components, there were not any dominant differences between responses of participants who enrolled with others and participants who enrolled alone.

Table 8a illustrates participants’ responses to ‘impact of relationships on making changes and overcoming barriers.’ For this prompt, four major codes emerged: relationship support ($n=23$), provided self with support ($n=9$), lack of support ($n=2$), and no impact ($n=9$). Within the major code ‘relationship support,’ the following minor codes emerged: general support ($n=7$), accountability ($n=6$), setting an example ($n=3$), and talking through plans ($n=7$). Of those participants who enrolled with others, four responses identified relationship support as a contributor to making changes and overcoming barriers, one response identified the participant provided themselves with support, one response identified the participant having a lack of support, and one response identified the participant’s support did not have an impact.

Table 8a: Codes, definitions, sample meaning units, code counts for participants' responses to 'impact of relationships on making changes and overcoming barriers'

Component and codes			Code counts		
Impact of relationships on making changes and overcoming barriers	Code definition	Sample meaning unit	Overall <i>n</i> =43	Enrolled with Others <i>n</i> =7	Enrolled Alone <i>n</i> =36
Relationship Support					
General support	Participant received support from another participant that helped in making changes and overcoming barriers, without specifying specific example	"People I knew gave me extra boost/push at the end to do what I needed to do" ^a	7	1	6
Accountability	Participant's relationship held them accountable to make changes and overcome barriers	"Worked together to get soda out of house (lives with spouse); helped to decrease intake"	6	2	4
Setting an example	Participant's relationship set an example to help him/her make changes and overcome barriers	"Because we were all going for the same goal and their attitudes changed too. Also when I watched them be successful it motivated me to keep reaching my goals"	3	0	3
Talking through plans	Participant talked through plans with another participant to help make changes and overcome barriers	"Able to talk to daughter and sister in law and supported each other"	7	1	6
Provided self with support	Participant did not receive support from another participant, and instead provided	"Relationships did not impact how I drank; did it without others" ^a	9	1	8

	themselves with support in making changes and overcoming barriers				
Lack of support	Participant expressed they did not experience any support in making changes and overcoming barriers	“She wasn’t making the changes I was making”	2	1	1
No impact	Participant’s relationships did not have an impact on making changes and overcoming barriers	“Having people I knew did not change my barriers or keep/move me to reaching my goals” ^a	9	1	8

a: Quotes are paraphrased as first person language instead of third person language

Table 8b illustrates participants’ responses to ‘concerns or thoughts when first signed up.’ For this prompt, three major codes emerged: positive thoughts (n=19), negative concerns (n=16), and no thoughts or concerns (n=10). Within the major code ‘positive thoughts,’ the following minor codes emerged: eager to improve health (n=10), eager to change (n=3), eager to participate (n=3), and general positive thoughts (n=3). Within the major code ‘negative concerns,’ the following minor codes emerged: nervous/difficult to change (n=14) and unsure of joining overall (n=2). Of those participants who enrolled with others, five responses identified positive thoughts when the participant first enrolled, one response identified negative concerns, and one response identified no thoughts or concerns. Out of the 19 responses that identified positive thoughts, 16 of these responses came from participants who had ‘very close’ ties to other participants at baseline.

Table 8b: Codes, definitions, sample meaning units, code counts for participants’ responses to ‘concerns or thoughts when first signed up’

Component and codes			Code counts		
Concerns or thoughts when first signed up	Code definition	Sample meaning unit	Overall <i>n</i> =45	Enrolled with Others <i>n</i> =7	Enrolled Alone <i>n</i> =38
Positive thoughts					
Eager to improve health	Participant expressed he/she wanted to improve his/her health or prevent health problems	“I put myself in the program because I want to get better for my health”	10	3	7
Eager to change	Participant expressed he/she wanted to change his/her SSB behavior	“I was thinking it would help me get off the pop”	3	1	2
Eager to participate	Participant expressed he/she as excited to join, learn, or get support in SIP <i>smart</i> ER	“Just thought it sounded interesting and that I’d try it”	3	1	2
General positive thoughts	Participant expressed general, positive thoughts about SIP <i>smart</i> ER	“Thought it was a wonderful idea”	3	0	3
Negative concerns					
Nervous/difficult to change	Participant expressed he/she was nervous about joining SIP <i>smart</i> ER due to change or thought it would be difficult to change SSB behavior	“I liked my soda and was afraid I would never reach the goal I set for self” ^a	14	0	14
Unsure of joining overall	Participant expressed he/she didn’t think they would like SIP <i>smart</i> ER	“Figured I wouldn’t like it, but I did”	2	1	1
No thoughts or concerns	Participant did not have any concerns about joining SIP <i>smart</i> ER	“Didn’t really have any concerns or thoughts about the program”	10	1	9

a: Quotes are paraphrased as first person language instead of third person language

Table 8c illustrates participants' responses to 'effect of knowing/not knowing someone on thoughts when joining.' For this prompt, three codes emerged: provided motivation/comfort (n=10), expected to help (n=2), and no effect (n=6). Of those participants who enrolled with others, two responses identified knowing someone affected the participant's thoughts/concerns when joining.

Table 8c: Codes, definitions, sample meaning units, code counts for participants' responses to 'effect of knowing/not knowing someone on thoughts when joining'

Component and codes			Code counts		
Effect of knowing/not knowing someone on thoughts when joining	Code definition	Sample meaning unit	Overall n=18	Enrolled with Others n=2	Enrolled Alone n=16
Provided motivation/comfort	Participant expressed knowing others provided him/her with motivation or comfort; e.g., "all in it together," "knew I wasn't alone"	"Knowing someone gave me a more positive outlook on it, you know, I'm not in this alone"	10	2	8
Expected to help	Participant did not know someone in SIP <i>smart</i> ER, but expressed that knowing someone would have helped him/her	"If husband had done it, it would've been easier"	2	0	2
No effect	Participant expressed that knowing someone did not have an effect on thoughts before joining	"No, just nervous about cutting back because of caffeine; would've been same with knowing someone"	6	0	6

Table 8d illustrates participants’ responses to ‘effect of knowing/not knowing someone on class attendance.’ For this prompt, three codes emerged: greater attendance (n=16), effected attendance – general (n=6), and no effect (n=21). Within the major code ‘greater attendance,’ the following minor codes emerged: general effect (n=4), motivated to attend (n=2), group setting helped (n=4), made classes fun (n=2), more comfortable (n=2), and looked forward to class (n=2). Of those participants who enrolled with others, two responses identified greater attendance through knowing someone, one response identified knowing someone generally affected attendance, and three responses identified knowing someone did not affect attendance.

Table 8d: Codes, definitions, sample meaning units, code counts for participants’ responses to ‘effect of knowing/not knowing someone on class attendance’

Component and codes			Code counts		
Effect of knowing/not knowing someone on class attendance	Code definition	Sample meaning unit	Overall n=43	Enrolled with Others n=6	Enrolled Alone n=37
Greater attendance					
General affect	Participant expressed that knowing someone helped him/her have greater class attendance	“Knowing someone made me more likely to come” ^a	4	0	4
Motivated to attend	Participant expressed that knowing someone motivated him/her to attend class	“Influenced to attend more”	2	1	1
Group setting helped	Participant expressed that having a group setting helped with class attendance	“Enjoyed interacting with others in class (everyone has different ideas to input in discussion)”	4	1	3
Made classes fun	Participant expressed that knowing someone made the classes more fun or	“It made attending the classes fun”	2	0	2

	enjoyable				
More comfortable	Participant expressed that knowing someone made him/her more comfortable going to class	“More comfortable going to class”	2	0	2
Looked forward to class	Participant expressed that knowing someone made them look forward to going to class	“Look forward to going and talking with them”	2	0	2
Affected attendance – general	Participant expressed that knowing/not knowing someone affected attendance, but did not express how or in what way; e.g., “yes”	“Yes”	6	1	5
No effect	Participant expressed that knowing/not knowing someone did not have an effect on class attendance	“No, would’ve attended same amount with knowing someone”	21	3	18

a: Quotes are paraphrased as first person language instead of third person language

Table 8e illustrates participants’ responses to ‘effect of knowing/not knowing someone on automated calls.’ For this prompt, three codes emerged: someone in group helped (n=7), personal social network helped (n=4), and no effect (n=32). Within the major code ‘someone in group helped,’ the following minor codes emerged: general help (n=3), reminded of calls (n=2), and did it together (n=2). Of those participants who enrolled with others, one response identified knowing someone in the group helped and five responses identified knowing someone had no effect.

Table 8e: Codes, definitions, sample meaning units, code counts for participants’ responses to ‘effect of knowing/not knowing someone on automated calls’

Component and codes			Code counts		
Effect of knowing/not knowing someone on automated calls	Code definition	Sample meaning unit	Overall <i>n</i> =43	Enrolled with Others <i>n</i> =6	Enrolled Alone <i>n</i> =37
Someone in group helped					
Reminded of calls	Participant expressed that knowing someone reminded him/her of automated calls	“Knowing people helped me do calls because they reminded me” ^a	2	0	2
Did it together	Participant expressed that knowing someone influenced them to complete automated calls together	“Gave us something to do together” ^a	2	1	1
General help	Participant expressed that knowing someone positively influenced him/her to complete more automated calls	“Completed more of the calls”	3	0	3
Personal social network helped	Participant expressed that someone within their personal social network (who was not a participant) helped; e.g., supervisor (Suzanne), husband, etc.	“Suzanne helped me with some of the calls”	4	0	4
No effect	Participant expressed that knowing someone did not effect his/her completion of automated calls	“No, did not effect either way”	32	5	27

a: Quotes are paraphrased as first person language instead of third person language

Table 8f illustrates participants’ responses to ‘barriers that impacted attendance.’ For this prompt, six codes emerged: childcare/caregiving (*n*=6), health/personal issues (*n*=3), transportation (*n*=1), general schedule conflict (*n*=4), work (*n*=7), and no barriers (*n*=17). Of those participants who enrolled with others, one response identified childcare/caregiving, one

response identified transportation, one response identified general schedule conflict, one response identified work, and one response identified having no barriers.

Table 8f: Codes, definitions, sample meaning units, code counts for participants’ responses to ‘barriers that impacted attendance’

Component and codes			Code counts		
Barriers that impacted attendance	Code definition	Sample meaning unit	Overall n=38	Enrolled with Others n=5	Enrolled Alone n=33
Childcare/caregiving	Participant expressed that caring for a child or family member that impacted class attendance	“Caregiver for granddaughter sometimes conflicted with class time”	6	1	5
Health/personal issues	Participant expressed that his/her own or a family member’s health and well being impacted class attendance	“Was doing chemo so stopped from coming to a couple classes”	3	0	3
Transportation	Participant expressed that difficulty getting to and from class impacted class attendance	“A way here to travel” ^a	1	1	0
General schedule conflict	Participant expressed that his/her general schedule impacted class attendance	“Time (actual time the classes took place)”	4	1	3
Work	Participant expressed that his/her job impacted class attendance	“Had to work late, so rushed to get here”	7	1	6
No barriers	Participant expressed there were no barriers	“No, very convenient”	17	1	16

	that impacted class attendance				
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a: Quotes are paraphrased as first person language instead of third person language

Table 8g illustrates participants’ responses to ‘barriers that impacted MCC completion.’ For this prompt, four codes emerged: family schedule (n=3), general schedule conflict (n=3), work (n=2), and no barriers (n=16). Of those participants who enrolled with others, one response identified family schedule, one response identified general schedule conflict, one response identified work, and one response identified having no barriers.

Table 8g: Codes, definitions, sample meaning units, code counts for participants’ responses to ‘barriers that impacted MCC completion’

Component and codes			Code counts		
Barriers that impacted MCC completion ^a	Code definition	Sample meaning unit	Overall n=24	Enrolled with Others n=4	Enrolled Alone n=20
Family schedule	Participant expressed that his/her family member’s schedule impacted MCC completion	“Scheduling; kids’ schedules – very busy; husband’s work schedule”	3	1	2
General schedule conflict	Participant expressed his/her general schedule impacted MCC completion	“Just life in general, it was hard to schedule between everything that was going on”	3	1	2
Work	Participant expressed his/her job impacted MCC completion	“Being at work”	2	1	1
No barriers	Participant expressed there were no barriers that impacted MCC completion	“No, everything was easy”	16	1	15

a: Asked only if participant was eligible for missed class calls

Table 8h illustrates participants' responses to 'barriers that impacted phone call completion.' For this prompt, three codes emerged: phone system barriers (n=6), personal barriers (n=16), and no barriers (n=20). Within phone system barriers, the following minor codes emerged: timing of calls (n=2) and general system issues (n=4). Within personal barriers, the following minor codes emerged: participant schedule conflict (n=7), childcare/caregiving (n=2), didn't like phone calls (n=2), and phone issues (n=5). Of those participants who enrolled with others, two responses identified phone system barriers, three responses identified personal barriers, and one response identified having no barriers.

Table 8h: Codes, definitions, sample meaning units, code counts for participants' responses to 'barriers that impacted phone call completion'

Component and codes			Code counts		
Barriers that impacted phone call completion	Code definition	Sample meaning unit	Overall n=42	Enrolled with Others n=6	Enrolled Alone n=36
Phone system barriers					
Timing of calls	Participant expressed the timing of the phone call impacted phone call completion	"When they called late and not when scheduled"	2	1	1
General system issues	Participant expressed something about the phone system impacted his/her phone call completion	"Had to call back and system didn't set up correctly"	4	1	3
Personal barriers					
Participant schedule conflict	Participant expressed that his/her general schedule impacted phone call completion	"Wasn't always nearby to answer call"	7	2	5
Childcare/caregiving	Participant expressed caring	"Distraction (single mom	2	0	2

	for a child or family member impacted phone call completion	with 4 kids so she sometimes missed them)”			
Didn’t like phone calls	Participant expressed he/she did not like the automated phone calls	“I don’t like talking on the phone”	2	1	1
Phone issues	Participant expressed his/her issues impacted phone call completion	“Phone service not good. Phone not reliable”	5	0	5
No barriers	Participant expressed there were no barriers that impacted phone call completion	“No barriers”	20	1	19

Discussion

Contrary to our hypothesis, enrolling with others did not positively influence reach, engagement, retention, or behavior change. Rather, enrolling alone was associated with significantly greater engagement in classes, MCC, phone calls, and total activities, and greater retention. There were no significant differences found with SSB kcal outcomes, and a substantially greater proportion of participants enrolled alone. These findings counter what the enrolling with others literature suggests.^{8,34-38} There are several potential explanations for these findings, such as the small sample size of the study population (especially in the ‘enrolling with others’ group) and a supervisor at a worksite encouraging their participating employees (who ‘enrolled alone’) to engage in *SIPsmartER* activities. Moreover, the larger sample size of this ‘enrolled alone’ group could be related to these individuals participating in *SIPsmartER* as an opportunity to have support. However, group cohesion was not measured in the current study,⁵⁶ so the relationship between those who enrolled alone and enrolled with others and their

connection to their cohort is unknown. Measuring group cohesion among cohorts could aid in further explaining these unexpected results. Given these considerations, further research is needed to explore the influence of ‘enrolling with others’ and social networks on recruitment, engagement, retention, and behavior change for participants from socioeconomically disadvantaged communities.

There were no obvious differences found between ‘enrolled with others’ and ‘enrolled alone’ and barriers impacting engagement in classes, MCC, or phone calls. While it was postulated that participants who enrolled with others may perceive fewer barriers to engagement due to the presence of social support and expected greater attendance,^{7,18,37,38} qualitative responses from participants who enrolled with others and those who enrolled alone identified various barriers to engagement, such as childcare/caregiving, work, and schedule conflicts. Another finding revealed through this qualitative analysis was that nearly half of responses identified the participant did not experience barriers to completing SIP*smart*ER activities. Drawing from literature on qualitative research, this could be attributed to participants experiencing anxiety or distress during the interview,⁵⁷ or it could relate to a lack of effective probing by the interviewer.⁵⁸ Regarding all qualitative prompts, another limitation is the interpretation of questions by the participants and responses by the researchers. Some questions were double-loaded (i.e., asked two questions in one prompt by the researcher), and others consisted of phrasing that could have been misunderstood by participants of lower literacy. Therefore, research should continue exploring the relationship between enrolling with others, behavior change and perception of barriers with individuals from socioeconomically disadvantaged populations in order to better inform the enrolling with others literature.

One finding from the current study is that participant and average cohort network density scores were associated with significant differences and significant relationships in some aspects of participant engagement and retention. Supported by literature on social networks,^{37,39} participants with a high categorical network density had significantly greater engagement (engagement in classes and total activities for participant network density, engagement in classes, phone calls, and total activities for average cohort network density) and retention than those with a lower network density. There were also significant relationships with correlations of participant and average cohort network densities and engagement (in all subcategories) and retention. This positive impact on class attendance and phone call completion is revealed through some responses in the qualitative analysis; however, many responses identified that knowing someone in the group did not have an effect. Moreover, there are trends for SSB kcal outcomes for categorical average cohort network density, but there are not any relationships when analyzed categorically for participant network density or continuously at the cohort and participant levels. Qualitative findings, however, suggest that participants' relationships to others within their cohort may have had a positive impact on making changes and overcoming barriers in *SIPsmartER*. The quantitative findings for engagement and retention contrast our expectation based on research by Valente et al,^{42,43} which suggests that participants with an 'optimal' network density experience the ideal environment for learning health behaviors, as networks with too high of a density may hinder the spread of "health information and behaviors."³⁹ These findings are however limited by the sample sizes for each categorical network density, as a greater number of participants with a "high" network density may have skewed the results. This data is also limited by the high engagement and retention of a large worksite. Analyses were conducted with exclusion of the worksite cohort, as this recruitment strategy differed greatly

from the other strategies that targeted pre-formed groups. The worksite was a closed group that only consisted of those who worked for the worksite, whereas the other groups consisted of outside individuals. When the worksite cohort (n=24) was excluded from analyses, the results differed. In general, relative to the complete sample, when the worksite cohort was removed from analyses, there were more significant findings between ‘very close’ ties and engagement and retention, but fewer significant relationships between network density scores and engagement. However, for the purposes of this thesis, the worksite was included to analyze a larger sample size (n=58). As the remaining 6 cohorts complete the study and the sample size increases, it will be important to retest the hypotheses with this worksite included and not included.

There were trends for participants with ‘very close’ ties and greater positive SSB kcal outcomes. This is inconsistent with our hypothesis, as it was expected for there to be a trend in the inverse direction.³¹ The expected finding is however revealed through our qualitative findings, where participants’ responses identified relationship support as a positive contributor to making changes in *SIPsmartER*. There were also trends for participants with ‘very close’ ties and greater engagement in MCC, phone calls, and total activities. Qualitative findings for both class attendance and phone call completion revealed some responses identifying the participant’s relationship to others as having a positive impact; however, many responses identified that knowing someone in the group did not have an effect. Based on findings by Wing et al and Gesell et al, participants’ ‘very close’ ties were expected to influence greater retention and health outcomes,^{31,37} and this was further expanded to include engagement. While the impact of relationships on engagement was not revealed, participants identified their relationship support from others in their cohort as having a positive impact on making changes and overcoming

barriers, and a majority of the responses for positive thoughts about joining *SIPsmartER* came from participants who had a ‘very close’ tie to another participant in *SIPsmartER*. Further, qualitative responses reveal some participants’ relationships provided motivation/comfort when joining, which is also identified in the literature on recruitment and social support that suggests social support can reduce anxiety and provide a comfortable environment.^{34,59} Thus, these positive thoughts may have influenced these participants’ enrollment into *SIPsmartER*. While the sample size of meaning units for our qualitative findings and sample size of the study population for our quantitative analysis limit the conclusions that can be drawn from the findings on ‘very close’ ties, future research should continue exploring the influence of ‘very close’ ties on participants in behavioral interventions.

There were similarities between the *SIPsmartER* study sample and census population estimates from the 2015 American Community Survey for southwest Virginia for mean age and majority race.⁴⁹ However, the study sample was more likely to be female, lower education, and lower median income. As suggested by literature on male health disparities, it is difficult to engage men in opportunities to improve their health,¹³ and men are also expected to have low motivation to change health behaviors.²⁴ Lower mean and median income in the *SIPsmartER* enrolled participant sample, as well as a higher proportion of individuals with an educational attainment of high school or less, could be related to the recruitment strategies used, such as targeting individuals of low socioeconomic status and low-income housing developments. These differences, however, suggests that the *SIPsmartER* study sample was successful in targeting those individuals who are often underrepresented in research studies.² The *SIPsmartER* study sample was representative of the population screened and eligible but not enrolled for males and educational attainment, but the *SIPsmartER* study sample was overrepresented in participants of

white race and had a significantly greater mean age. While the total proportions of eligible participants and enrolled participants were lower than those of Talking Health, SIP*smart*ER had a somewhat higher proportion of male participants enroll. This slight increase in male reach, however, cannot be attributed to using the ‘enrolling with others’ strategy due to the small sample size and use of other recruitment strategies (i.e., targeting a worksite with a large male population) to improve recruitment of participants.

There were no statistically significant or trending findings for the following: 1) increased enrollment of men, engagement and retention with enrolling with others; 2) engagement, retention, and behavior change with family/friends in advice network; 3) engagement in classes with ‘very close’ ties; 4) engagement in MCC with participant and average cohort network densities; 5) engagement in MCC and phone calls and behavior change with categorical participant network densities; 6) engagement in MCC with categorical average cohort network densities; 7) behavior change with continuous participant and average cohort network densities. This could be related to multiple factors, one of the most evident being the small sample size of participants overall, and particularly in the ‘enrolling with others’ group. Other factors could include the cited characteristics of Appalachian populations, such as not feeling in control of life’s occurrences,¹⁰ which may ultimately impact motivation, or participants may have enrolled in SIP*smart*ER for alternative reasons (e.g., baseline incentive) without the intention of actively engaging. The absence of significant relationships with advice network ties and ‘very close’ ties could be related to the nature of the current study, as it was a secondary analysis of an implementation trial and not a social support intervention. Thus, researchers did not encourage participants to go to friends and family members for advice or support throughout SIP*smart*ER. While literature surrounding Appalachian culture suggests individuals often have close support

from family and friends,^{10,23} it cannot be expected that participants will utilize this system for advice or support throughout the duration of the intervention. More research on this topic may inform the body of literature surrounding relationships between enrolling with others, network density, ‘very close’ ties, and advice networks with recruitment, engagement, retention, and behavior change.

Recommendations for Future Research

While previous studies have explored how an ‘enrolling with others’ strategy and social networks may influence recruitment,^{34,35} engagement,⁸ retention,³⁷ and behavior change in health behavior interventions,^{7,8,38} this topic is still relatively new, and resultantly, there are gaps in the research. Based on our review of the enrolling with others literature, research surrounding enrolling with others and its association with engagement, retention, and behavior change has either been the primary objective of the study with assigning groups and manipulating treatments,^{31,37,39} or the study is limited to exploring behavior change in spousal pairs.^{40,41} Further, previous research studying individuals from disadvantaged communities have used an enrolling with others strategy to influence recruitment without reporting its effect on engagement, retention, and behavior change.^{35,36} Few known studies have explored ‘enrolling with others’ in a pragmatic environment without treatment manipulation.^{8,38} Thus, the focus of this study was to close these gaps by exploring the influence of an ‘enrolling with others’ strategy with enrollment in a behavioral intervention targeting adults from Central Appalachia, a medically-underserved region of the United States that is typically difficult to engage in health behavior interventions, and understand the influence of enrolling with others on reach, engagement, retention, and behavior change. However, the limitations described above paired with our findings leave way for more research to be explored on social networks and an

‘enrolling with others’ strategy. In order to better understand the influence of enrolling with others on being an effective recruitment strategy for adults in Central Appalachia, researchers should study an ‘enrolling with others’ strategy with a larger study population at equivalent recruitment sites of pre-formed and unformed groups. Recruiting a larger study population at equivalent recruitment sites may improve the representation of the study sample when compared to the census population estimates for southwest Virginia. Moreover, targeting recruitment at sites that are more comparable may aid researchers in further understanding the influence of ‘enrolling with others’ and social networks. Through having a supervisor influencing attendance at a worksite of participants with a high network density that enrolled alone, our engagement and retention was improved; however, understanding the influence of this strategy and social networks was limited. The role of this supervisor, however, could be an avenue for further research when studying social networks. While group structure was not explored in the current study, this supervisor’s leadership role made her a gatekeeper for the worksite,⁵⁶ which relates to the concept of centrality within a social network.⁵¹ This supervisor’s involvement encouraged participants to engage in SIP*smart*ER activities, and the presence of this role may have also increased group cohesion.⁵⁶ The remaining pre-formed cohorts, such as housing developments, did not have a gatekeeper with as much influence, which may relate to the comparatively lower engagement and retention of these cohorts. Thus, research on social networks should factor in the concept of centrality and consider identifying a gatekeeper to aid in increasing cohesion of the cohort. Also, future research may give greater insight into the influence of network density and ‘very close’ ties, as our qualitative responses revealed relationship support may positively influence making changes and overcoming barriers, and knowing others when joining rather than only using an ‘enrolling with others’ referral strategy may yield positive thoughts that encourage

enrollment. Further, future research on these topics should consider studying larger and more equal ‘enrolled with others’ and ‘enrolled alone’ groups in order to better understand the strategy’s influence on recruitment, engagement, retention, and behavior change. Finally, as this study was a secondary analysis of the implementation of a behavioral intervention and social networks were not manipulated, further research on ‘enrolling with others,’ social support, and social networks should consider targeting a socioeconomically disadvantaged study sample in order to gain more understanding on the impact these strategies may have on this population.

Conclusions

While the findings from the current study should be interpreted within the context of its limitations, including the relatively small sample, our findings are not consistent with the ‘enrolling with others’ literature. Specifically, findings from the current study suggest that enrolling alone is associated with greater engagement and retention, and enrolling with others was not associated with greater enrollment of men. There should be further exploration in use of an ‘enrolling with others’ strategy to understand its influence on recruitment, engagement, retention, and behavior change for individuals from socioeconomically disadvantaged communities, specifically those from Central Appalachia. However, findings suggest participating in a behavioral intervention with a higher network density may lead to greater engagement and retention in the intervention. Further, relationship support may have a positive impact on participants making changes and overcoming barriers. Given these findings from our study and the literature on enrolling with others and disadvantaged communities,^{8,10,18,36-38} researchers should continue exploring the use of an ‘enrolling with others’ strategy and social networks in behavioral interventions and its influence on recruitment, engagement, retention, and behavior change.

Appendices

Appendix A: Intake Survey

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



Virginia Department of Health Customer Survey

Thank you for being willing to complete this survey. By filling out this survey, you agree to let Virginia Tech use the answers you provide to help the Virginia Department of Health and other health departments improve their services.

The answers you provide will be kept private; only the researchers will know how you replied. If you do not want to answer a question, you can skip it. If you have any questions about the survey, please ask the staff member who asked you to complete the survey or you can call Dr. Zoellner or Dr. Porter who are leading this project at 540.553.1768.

First, we would like to know what beverages you have drank in the past month.

1. During the past 30 days, how often did you drink regular soda or pop that contains sugar? *Do not include diet soda or diet pop.* Select only one and fill in number.

___ Times per day ___ Times per week ___ Times per month Never

2. During the past 30 days, how often did you drink sugar-sweetened fruit drinks (such as Kool-aid™ and lemonade), sweet tea, and sports or energy drinks (such as Gatorade™ and Red Bull™)? *Do not include 100% fruit juice, diet drinks, or artificially sweetened drinks.* Select only one and fill in number.

___ Times per day ___ Times per week ___ Times per month Never

These next 3 questions will help us understand the reading needs of people taking this survey. **Choose only one answer for each question.**

3. How certain are you that you could fill out medical forms by yourself?

Extremely Quite a bit Somewhat A little bit Not at all

4. 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 Sometimes Usually Always

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

5. How would you describe your ability to read?

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

Next, we would like to know how well staff at the Virginia Department of Health explain things to you and how well they listen to you. *Choose only one answer for each question.*

6. Have you received services from the health department in the past 12 months, such as medical care, education, restaurant inspections or environmental services.

- No *Skip to question 14* Yes *Continue to question 7*

7. When you fill out health department forms, how often are they written in a way that is easy for you to read, understand, and complete?

- Never Sometimes Usually Always

8. When you receive written materials from the health department, how often are they easy for you to read and understand?

- Never Sometimes Usually Always

9. When you need information/services, how often do health department staff refer to important information about your history that you have previously given them?

- Never Sometimes Usually Always

10. When you need information/services, how often do health department staff spend enough time with you?

- Never Sometimes Usually Always

11. When you need information/services, how often do health department staff encourage you to ask questions?

- Never Sometimes Usually Always

12. When you need information/services, how often do health department staff explain things in a way that is easy to understand?

- Never Sometimes Usually Always

13. When you need information/services, how often do health department staff ask you to describe how you were going to follow instructions?

- Never Sometimes Usually Always

Appendix B: ‘Maybe Eligible’ Calling Script

Recruitment Scripts: MAYBE ELIGIBLE

ID NUMBER [] [] [] [] []

SECTION A: INTRODUCTION TO SIPSMARTER

Opening for first call: Hi, My name is _____. I work at Virginia Tech and I am calling you in response to a survey you completed for your local health department. On this survey, you indicated that you were interested in learning more or sharing your thoughts about programs being offered by the health department. I am calling to tell you more SIPsmartER, a free program the health department will be offering to see what you think and to see if you might want to be part of it. I mailed you a brochure about the program but you may have not received it yet.

If for follow-up call due to a reschedule or voice message: Hi, this is _____ from Virginia Tech. I spoke with you/left a message for you on _____ and I am calling you back to talk to you more about SIPsmartER, a new free program being offered by the health department.

A. If not home and leaving a message: I will call you back in a day or two. If you would like to call me back, I can be reached at _____ Mondays to Friday between ___ and __. Thank you.

B. If they are home: Is this a good time to talk further about SIPsmartER?

a. If “No and I do not want to learn more”: Thank you for letting me know. Before, I end the call and so that we can understand more about why people may not be interested in the program, please let me know why you are not interested in talking more about SIPsmartER. [Record comments] Thank you for your time. [End call]

Reason not interested: _____

b. If “No but I do want to learn more”: I am glad you are interested in the program. When would be a good time for me to call back? Thank you for your time. [End call]

c. If “Yes”: continue with the rest of the script

I am glad that you want to learn more about SIPsmartER. SIPsmartER is a FREE program to help customers take control of their health by drinking fewer sugary drinks – like soda/pop, sweet tea, sports drinks, and fruit juice. Drinking fewer sugary drinks is important because drinking too many can cause major health problems, like diabetes, heart disease, and cancer. SIPsmartER has helped people lower their intake of sugary drinks by 19 ounces.

SIPsmartER is 6-months long and is made up of 3 small-group classes, 12 phone calls, and 2 health screenings. In the health screenings, we will collect information on your height and weight and ask you survey questions about your sugary drink behaviors and health status. The length of the program makes sure you get the support you need to drink fewer sugary drinks BUT the design is also flexible to your time needs. You will also receive a \$25 Walmart gift card for completing the first health screening and a \$50 Walmart gift card for finishing the second health screening.

We will use the information from the screenings, classes, and calls for research purposes. We want to learn more about how adults in Southwest Virginia make changes in their sugary drink behaviors. The results will also be shared with the Virginia Department of Health to help them decide if they will offer the SIPsmartER program in the future.

Now that you know more about SIPsmartER, is it something that you might be interested in signing-up for?

- A. If “No”** Thank you for letting me know. Before, I end the call and so that we can understand more about why people may not be interested in the program, please let me know why you are not interested in talking more about SIPsmartER. [*Record comments*] Thank you for your time. [*End call*]

Reason not interested: _____

- B. If “Yes”** Continue with Section B

SECTION B: SCREENING

Wonderful! Based on your responses on the health department survey, I need to ask you a few more questions about the sugary drinks your usually drink. Your honest answers are important to the project and will help tell me if you would be eligible for SIPsmartER. These questions are about the types of beverages you have drank in the past month. Ask any questions you have regarding the beverages or serving size options. Remember that all the answers you provide are private. Only the researchers will have access to your answers. You will not be identified as a result of this study.

- 1a. How often do you drink sweetened juice beverages/drinks (such as fruit aides, lemonade, punch, or Sunny Delight)?
- | | |
|---|--|
| <input type="checkbox"/> Never or less than 1 time per week | <input type="checkbox"/> 1 time per day |
| <input type="checkbox"/> 1 time per week | <input type="checkbox"/> 2 times per day |
| <input type="checkbox"/> 2-3 times per week | <input type="checkbox"/> 3 or more times per day |
| <input type="checkbox"/> 4-6 times per week | |
- 1b. When you drink sweetened juice beverages/drink, how much do you normally drink?
- | | |
|--|---|
| <input type="checkbox"/> less than 6 fluid ounces (or $\frac{3}{4}$ cup) | <input type="checkbox"/> 16 ounces (2 cups) |
| <input type="checkbox"/> 8 ounces (1 cup) | <input type="checkbox"/> more than 20 ounces (2 $\frac{1}{2}$ cups) |
| <input type="checkbox"/> 12 ounces (1 $\frac{1}{2}$ cups) | |

2a. How often do you drink regular soft drinks (NOT diet)?

- | | |
|---|--|
| <input type="checkbox"/> Never or less than 1 time per week | <input type="checkbox"/> 1 time per day |
| <input type="checkbox"/> 1 time per week | <input type="checkbox"/> 2 times per day |
| <input type="checkbox"/> 2-3 times per week | <input type="checkbox"/> 3 or more times per day |
| <input type="checkbox"/> 4-6 times per week | |

2b. When you drink regular soft drinks (NOT diet)?

- | | |
|--|---|
| <input type="checkbox"/> less than 6 fluid ounces (or $\frac{3}{4}$ cup) | <input type="checkbox"/> 16 ounces (2 cups) |
| <input type="checkbox"/> 8 ounces (1 cup) | <input type="checkbox"/> more than 20 ounces (2 $\frac{1}{2}$ cups) |
| <input type="checkbox"/> 12 ounces (1 $\frac{1}{2}$ cups) | |

3a. How often do you drink sweetened tea (sweetened with sugar)?

- | | |
|---|--|
| <input type="checkbox"/> Never or less than 1 time per week | <input type="checkbox"/> 1 time per day |
| <input type="checkbox"/> 1 time per week | <input type="checkbox"/> 2 times per day |
| <input type="checkbox"/> 2-3 times per week | <input type="checkbox"/> 3 or more times per day |
| <input type="checkbox"/> 4-6 times per week | |

3b. When you drink sweetened tea (sweetened with sugar)?

- | | |
|--|---|
| <input type="checkbox"/> less than 6 fluid ounces (or $\frac{3}{4}$ cup) | <input type="checkbox"/> 16 ounces (2 cups) |
| <input type="checkbox"/> 8 ounces (1 cup) | <input type="checkbox"/> more than 20 ounces (2 $\frac{1}{2}$ cups) |
| <input type="checkbox"/> 12 ounces (1 $\frac{1}{2}$ cups) | |

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

- | | |
|---|--|
| <input type="checkbox"/> Never or less than 1 time per week | <input type="checkbox"/> 1 time per day |
| <input type="checkbox"/> 1 time per week | <input type="checkbox"/> 2 times per day |
| <input type="checkbox"/> 2-3 times per week | <input type="checkbox"/> 3 or more times per day |
| <input type="checkbox"/> 4-6 times per week | |

4b. When you drink tea or coffee, with cream and/or sugar (includes non-dairy creamer)?

- | | |
|--|---|
| <input type="checkbox"/> less than 6 fluid ounces (or $\frac{3}{4}$ cup) | <input type="checkbox"/> 16 ounces (2 cups) |
| <input type="checkbox"/> 8 ounces (1 cup) | <input type="checkbox"/> more than 20 ounces (2 $\frac{1}{2}$ cups) |
| <input type="checkbox"/> 12 ounces (1 $\frac{1}{2}$ cups) | |

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

- | | |
|---|--|
| <input type="checkbox"/> Never or less than 1 time per week | <input type="checkbox"/> 1 time per day |
| <input type="checkbox"/> 1 time per week | <input type="checkbox"/> 2 times per day |
| <input type="checkbox"/> 2-3 times per week | <input type="checkbox"/> 3 or more times per day |
| <input type="checkbox"/> 4-6 times per week | |

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

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

[Before moving onto SECTION C: Eligibility input sugary drink responses into BEV-Q Excel template to calculate kcals per day. If ≥ 200 kcal per day the participant is eligible. If not they are not eligible. If eligible mostly because of coffee intake; confirm that they drink premade coffee drinks (e.g., Starbucks Frappuccino) or add sugar or a creamer with sugar into their coffee.]

STATUS: _____ Eligible (Part Ca) _____ Ineligible (Part Cb)

SECTION Ca: ELIGIBLE (≥ 200 kcal/day), SET APPOINTMENT, AND REFERRAL

Thank you for answering those questions for us. Based on your answers, you are eligible to participate in SIPsmartER!

Confirm Contact Information

First, let me confirm your contact information.

Mailing Address: _____

Home Phone Number: _____ Cell Number: _____

Email Address _____ Receive Texts Yes or No

Set Date for Screening Appointment

[If the day/time has not yet been set for the screening, skip to the family/friend section and let the participant know that you will be calling them back to set the day/time of the screening.]

Now Let's we set a date and time for your screening appointment? *[Using the calendar for the cohort, work with the participant to set a day/time based on the schedule for the cohort; you want them to schedule now to avoid another call. They can always change the day/time. Be sure to let them know the location]*

Screening Day and Time _____

Great! We will send you a post card reminder a week before the appointment and call you at this number the day before to remind you about the appointment. If you have any questions or need to change the appointment day or time, you can call _____ at _____.

Family/Friend Referral

[Now that we have you scheduled,] I am wondering if you have one or more friends or family members who might also be interested in taking part in SIP*smart*ER. We are especially interested in getting more men to join the program. Men tend to consume the most sugary beverages and are also least likely to participate in health programs like SIP*smart*ER. Do you have any male friends or family members that you could refer?

- A. **No.** OK, no problem. If you do think of someone later who might like to learn more about SIP*smart*ER, feel free to tell them about SIP*smart*ER and give them my name and number [*repeat name and number*] Thank you for your time. [*Remind them of their appointment time and end call*]
- B. **Yes.** Wonderful! Would you be willing to share the extra copy of the program brochure we sent with them. If you have misplaced it (or never received it), I can mail you another one. Also, please give him my name and number [*repeat name and number*] and have him give me a call. I would be happy to see if they would be a good fit for the program and answer his questions about the study.

Do you have any other friends or family members who might be interested in SIP*smart*ER?

- A. **No.** OK, no problem. If you think of someone later who might like to learn more about SIP*smart*ER, feel free to tell them about SIP*smart*ER and give them my name and number [*repeat name and number*] Thank you for your time. [*Remind them of their appointment time and end call*]
- B. **Yes.** Wonderful! Would you be willing to share the extra copy of the program brochure with them. If you have misplaced it (or never received it), I can mail you another one. Please give them my name and number [*repeat name and number*] and have them give me a call. I would be happy to see if they would be a good fit for the program and answer any questions they have about the study.

Thank you for your time. [*Remind them of their appointment time and end call*]

SECTION Cb: NOT ELIGIBLE (<200kcal/day) AND REFERRAL

Thank you for answering those questions for us. Based on your answers, you do not consume too many sugary drinks – which is good for your health but means you are not eligible to participate.

Even though you are not eligible, I am wondering if you have one or more friends or family members who might also be interested in taking part in SIP*smart*ER. We are especially interested in getting more men to join the program. Men tend to consume the most sugary beverages and are also least likely to participate in health programs like SIP*smart*ER. Do you have any male friends or family members that you could refer?

- A. **No.** OK, that's OK. If do you think of someone later who might like to learn more about SIPsmartER, feel free to tell them about SIPsmartER and give them my name and number [repeat name and number] Thank you for your time. [Remind them of their appointment time and end call]
- B. **Yes.** Wonderful! Would you be willing to share the extra copy of the program brochure we sent with them. If you have misplaced it (or never received it), I can mail you another one. Also, please give him my name and number [repeat name and number] and have him give me a call. I would be happy to see if they would be a good fit for the program and answer his questions about the study.

Do you have any other friends or family members who might be interested in SIPsmartER?

- A. **No.** OK, no problem. If you think of someone later who might like to learn more about SIPsmartER, feel free to tell them about SIPsmartER and give them my name and number [repeat name and number] Thank you for your time. [Remind them of their appointment time and end call]
- B. **Yes.** Wonderful! Would you be willing to share the extra copy of the program brochure with them. If you have misplaced it (or never received it), I can mail you another one. Please give them my name and number [repeat name and number] and have them give me a call. I would be happy to see if they would be a good fit for the program and answer any questions they have about the study.

Thank you for your time. [Remind them of their appointment time and end call]

Appendix C: Social Networking Questionnaire

[PARTICIPANT ID Number]: _____

SOCIAL NETWORKING QUESTIONS

Data Collector Initials: _____

READ: Below is a list of people that are enrolling in SIP smartER. I am going to ask you a few questions about your relationships with each of these people and how well you may know any of them.

- What is your relationship to this person?
- If a family member, what is your relationship to this person?
- How close would you rate your relationship with this person?
- Did you refer this person to SIP smartER or did they refer you to SIP smartER?

		a. Your relationship to this person	b. If a family member	c. Closeness	d. Referral
SN101	Participant's Name	0. Self (skip rest) 1. Stranger/do not know them (skip rest) 2. Family member & lives in same house (go to b) 3. Family member & does not live in same house (go to b) 4. Friend & lives in same house (go to c) 5. Friend & does not live in same house (go to c) 6. Co-worker (go to c) 7. Casual acquaintance /contact (go to c) 8. Other: _____ (go to c)	1. Spouse 2. Mother 3. Father 4. Sister 5. Brother 6. Cousin 7. Other: _____	1. Very close 2. Somewhat close 3. Not close	1. Yes, they referred me 2. Yes, I referred them 3. No
SN102	Participant's Name	0. Self (skip rest) 1. Stranger/do not know them (skip rest) 2. Family member & lives in same house (go to b) 3. Family member & does not live in same house (go to b) 4. Friend & lives in same house (go to c) 5. Friend & does not live in same house (go to c) 6. Co-worker (go to c) 7. Casual acquaintance /contact (go to c) 8. Other: _____ (go to c)	1. Spouse 2. Mother 3. Father 4. Sister 5. Brother 6. Cousin 7. Other: _____	1. Very close 2. Somewhat close 3. Not close	1. Yes, they referred me 2. Yes, I referred them 3. No

[PARTICIPANT ID Number]: _____

READ: Now I want you to think about all the people and relationships in your life, who would you go to for advice on making healthier lifestyle choices, like drinking fewer sugary drinks?

Once they have listed the names of people, ask

- a. Why do you go to this person for advice on making healthier lifestyle choices?
- b. What is your relationship to this person?
- c. If a family member, what is your relationship to this person
- d. Is this person part of SIPsmartER or have they been part of SIPsmartER in the past?

Name	a. Why this person?	b. Your relationship to this person	c. If a family member	d. Are they a part of SIPsmartER?
SN201		0. Self (<i>skip rest</i>) 1. Stranger/do not know them (<i>skip rest</i>) 2. Family member & lives in same house (<i>go to b</i>) 3. Family member & does not live in same house (<i>go to b</i>) 4. Friend & lives in same house (<i>go to c</i>) 5. Friend & does not live in same house (<i>go to c</i>) 6. Co-worker (<i>go to c</i>) 7. Casual acquaintance /contact (<i>go to c</i>) 8. Other: _____ (<i>go to c</i>)	1. Spouse 2. Mother 3. Father 4. Sister 5. Brother 6. Cousin 7. Other: _____	1. Yes, current enrollee 2. Yes, in the past 3. No
SN202		0. Self (<i>skip rest</i>) 1. Stranger/do not know them (<i>skip rest</i>) 2. Family member & lives in same house (<i>go to b</i>) 3. Family member & does not live in same house (<i>go to b</i>) 4. Friend & lives in same house (<i>go to c</i>) 5. Friend & does not live in same house (<i>go to c</i>) 6. Co-worker (<i>go to c</i>) 7. Casual acquaintance /contact (<i>go to c</i>) 8. Other: _____ (<i>go to c</i>)	1. Spouse 2. Mother 3. Father 4. Sister 5. Brother 6. Cousin 7. Other: _____	1. Yes, current enrollee 2. Yes, in the past 3. No

Appendix D: Summative Evaluation

PARTICIPANT ID Number: |__| |__| |__| |__| |__|

SIPsmartER SUMMATIVE EVALUATION

Start Time: _____

End Time: _____

You have almost completed the 6-month health assessment. For this next set of questions, we are interested in learning about your experience with SIPsmartER so we can help make the program better for other people. We will ask you questions about what you have done to be part of this program, how long it took you to do different things, and your opinions about parts of the program. All of your comments are important to us – even if you think you are being nitpicky.

PARTICIPANT ID Number: |__| |__| |__| |__| |__|

ENGAGING IN SIPsmartER WITH(OUT) OTHERS

Had a close relationship with one in SIPsmartER cohort ____

Referred someone ____

Was referred by someone ____

Now, it seems as though you referred/were referred/ knew people well before starting in the program OR it seems as though you did not know anyone before starting the program. I have a few questions about how knowing or not knowing people in the program may have impacted your experience with SIPsmartER.

4 Did (not) having relationships with other people before starting SIPsmartER impact how you made these changes and overcame your barriers reach your goals? _____
Probe: Why or why not? How?

I would also like to know a little more about your experience with others in the program.

5 Did you ask anyone to join SIPsmartER with you who did not join? _____
What were their reasons for not joining?

6 Thinking back to your own experience, what were your concern or thoughts did you have when you first signed up for SIPsmartER and came to the first health screening? *Prompts: Did (not) knowing someone in the group affect what you think?*

7 Thinking back to your own experience, how did knowing (or not knowing) someone in the group affect your attending classes? Your completing the automated calls?

PARTICIPANT ID Number: |__| |__| |__| |__| |__|

GROUP CLASSES

Number of Classes Attended _____

[Skip to question 15 if they did not complete any in-person classes.]

Now, I would like to ask about your First, we would like to know a little more about your thoughts about the group classes.

8 Describe what you liked about the small group classes. *Probe: What made you like that part of the class? Anything else you liked?*

9 Describe how you think we could make the small group classes better.

Now, I would like to ask you to rate what you thought about specific parts of the group classes.
[Describe the satisfaction hand cards]

10 How satisfied were you with how the group classes were organized? _____

11 How satisfied were you with the information presented in the group classes? _____

12 How satisfied were you with the type of activities presented in the group classes? _____

Sometimes it was hard for our participants to attend group classes, we would like to know a little more about your experiences so we could make it easier for others to attend classes in the future.

13 How long did it take you to travel to the classes you attended? _____ min
[Record one-way travel time in minutes]

14 Please tell me about any barriers (obstacles) that made attending the classes hard for you.

PARTICIPANT ID Number: |__| |__| |__| |__| |__|

MISSED CLASS CALLS

Number of Missed Class Calls Completed ____

Number of Missed Class Call Videos Watched ____

[Skip to Question 21 if did not complete missed class calls.]

I noticed that you completed some of the classes as missed class calls. I would like to ask you a few questions about your experience with these calls.

15 Describe what you liked about the missed class calls.
Probe: What made you like that part of the call? Anything else you liked? If they watched any of the videos, probe directly about it.

16 Describe how you think we could make the missed class calls (and videos) better.

17 Going through the class with the staff on the telephone **helped me learn** the material. _____

18 The videos were well-designed. _____

19 How much do you agree that having staff call to review class materials is important when I miss the class _____

20 Please tell me about any barriers (obstacles) that made completing the missed class calls hard for you.

PARTICIPANT ID Number: |__| |__| |__| |__| |__|

AUTOMATED (IVR) CALLS

Number of IVR Calls Completed _____

[Skip to Question 30 if did not complete any calls]

Now, I am going to ask you some questions about the automated (or IVR) calls you received.

21 Describe what you liked about the automated (or IVR) calls. *Probe: What made you like that part of the call? Anything else you liked?*

22 Describe how you think we could make the automated (or IVR) calls better.

Now, I would like to ask you to rate what you thought about specific parts of the automated calls.
[Describe the agreement hand cards]

23 The automated calls provided me with useful strategies to help me drink fewer sugary drinks. _____

24 The automated telephone system was easy to use _____

25 The telephone calls were personalized for my goals. _____

26 I was satisfied with the number of calls _____

27 I was satisfied with the length of each call _____

28 I would recommend using telephone calls again in the future to help me make healthy lifestyle changes _____

29 Overall, how satisfied were you with the automated telephone calls? _____

Sometimes it was hard for our participants to complete the automated calls, we would like to know a little more about your experiences so we could make it easier for others to do so in the future.

30 Please tell me about any barriers (or obstacles) that may have made completing the phone calls difficult for you.

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