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## Qualitative Application of the Theory of Planned Behavior to Understand Beverage Behaviors among Adults

**Jamie Zoellner, PhD, RD [Assistant Professor],**

Virginia Polytechnic Institute and State University, Department of Human Nutrition, Foods and Exercise, Integrated Life Sciences Building 23, Room 1034 (0913), 1981 Kraft Drive, Blacksburg, VA 24061, 540-231-3670

**Erin Krzeski, MS,**

Virginia Polytechnic Institute and State University, Department of Human Nutrition, Foods and Exercise, Integrated Life Sciences Building 23, Room 1034 (0913), 1981 Kraft Drive, Blacksburg, VA 24061, 540-231-3670

**Samantha Harden [PhD candidate],**

Virginia Polytechnic Institute and State University, Department of Human Nutrition, Foods and Exercise, VT Riverside, 1 Riverside Circle, 540-857-6664, SW Roanoke, Virginia, 24016

**Emily Cook [DPD and MS student],**

Virginia Polytechnic Institute and State University, Department of Human Nutrition, Foods and Exercise, Integrated Life Sciences Building 23, Room 1034 (0913), 1981 Kraft Drive, Blacksburg, VA 24061, 540-231-3670

**Kacie Allen [PhD student], and**

Virginia Polytechnic Institute and State University, Department of Human Nutrition, Foods and Exercise, VT Riverside, 1 Riverside Circle, 540-857-6664, SW Roanoke, Virginia, 24016

**Paul A. Estabrooks, PhD [Professor]**

Virginia Polytechnic Institute and State University, Department of Human Nutrition, Foods and Exercise VT Riverside, 1 Riverside Circle, SW Roanoke, Virginia, 24016, 540-857-6664

Jamie Zoellner: Zoellner@vt.edu; Erin Krzeski: ekrzeski@gmail.com; Samantha Harden: downey.samantha@gmail.com; Emily Cook: hokies32@vt.edu; Kacie Allen: kaciea1@vt.edu; Paul A. Estabrooks: estabrpk@vt.edu

### Abstract

Despite strong scientific data indicating associations among sugar-sweetened beverages (SSB) and numerous adverse health outcomes, little is known about culturally specific beliefs and potential individual-level behavioral strategies to reduce SSB intake. The primary objective of this formative study targeting adults residing in rural southwest Virginia was to apply the Theory of Planned Behavior (TPB) to investigate culturally specific attitudes, subjective norms and perceived behavioral control constructs related to the consumption of SSB, water, and artificially sweetened beverages. Using a homogenous sampling strategy, eight focus groups were conducted with 54 adult participants who exceeded recommendations of <1 cup of SSB/day. An experienced moderator and co-moderator utilized a semi-structured script, grounded in the TPB, to execute the

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Correspondence to: Jamie Zoellner, Zoellner@vt.edu.

\*Note: Ms. Krzeski is currently a dietetic intern at Brigham & Women's Hospital in Boston, MA

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focus group. All focus groups were audio taped and transcribed verbatim. Three researchers independently coded meaning units (MU) to the major themes and subsequently met to gain consensus in coding. Important beverage specific themes emerged for attitudes, subjective norms, perceived behavioral control, and intentions. Across all beverages, the most notable themes included taste (n= 161 MU), availability/convenience (n= 95 MU), habit/addiction (n=57 MU), and cost (n= 28 MU). Health consequences associated with beverages and water quality issues also surfaced, as well as normative beliefs including the influence of doctors and peers. The identified themes and sub-themes provides critical insight into understanding culturally-relevant context and beliefs associated with beverage behaviors and helps inform the development and evaluation of future intervention efforts targeting SSB consumption in the health disparate region of southwest Virginia.

## Keywords

qualitative research; health behavior; beverages; dietary habits; health status disparities

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## Introduction

Large increases in Americans' consumption of sugar-sweetened beverages (SSB) have been a topic of concern. Between 1977 and 2002, the intake of caloric beverages doubled in the United States, with most recent data showing that children and adults in the United States consume about 172 and 175 kcal daily, respectively, from SSB(1). It is estimated that SSB account for about 10% of total energy intake in adults(2, 3). High intake of SSB has been related to many adverse health outcomes including type 2 diabetes, obesity, dental caries and heart disease(4–8).

When developing behavioral interventions to address unhealthy dietary behaviors, such as SSB consumption, formative and theory-grounded qualitative data can provide information needed to understand cultural perspectives and develop targeted intervention strategies(9). The Theory of Planned Behavior (TPB) is an individual level health behavior theory that has been used to understand a variety of health behaviors(10–14), including diet related behaviors and SSB consumption(12, 13, 15–19). The TPB proposes that behavior can be predicted directly by one's intention and perceptions of behavioral control(10). It also proposes that subjective norms, attitude, perceived behavioral control indirectly influence behavior through intentions(10).

The TPB can be used for all phases of behavioral intervention development, implementation, and evaluation(10, 14, 15); however, few known studies have comprehensively incorporated the TPB. For example, a review of 24 TPB interventions revealed that only about half of the studies used the TPB to develop the intervention and the other half used the TPB to assess intervention effectiveness(13). Similarly, as pointed out by Conner & Sparks(15), researchers rarely conduct formative studies to identify appropriate TPB grounded targets for intervention efforts. In fact, the majority of TPB studies across all health behaviors are quantitative and cross-sectional in design(11–13, 15, 20–26). While these quantitative studies illustrate the usefulness of the TPB in predicting behaviors, qualitative studies to better understand the underlying cultural beliefs associated with dietary behaviors are equally as important(10, 14, 15). Nonetheless, relatively few dietary behaviors studies have qualitatively applied the TPB(27, 28).

This research targets at-risk rural counties of southwest Virginia that lie in the health disparate Appalachia region, a federally designated medically underserved area(29). When compared to the state of Virginia and national averages, the targeted region has low

socioeconomic status and literacy levels(30, 31). In addition, the prevalence of diabetes and obesity in this region exceeds that of the state of Virginia(32), and mortality from diabetes is almost twice as high as the state average(33). Although this region is predominantly white (i.e. 95.3% white, 3.4% African American, 1.3% other origin), Appalachia has historically been identified as a distinctive cultural region with unique dialect, music, folklore, religion, education, and social and economic stratification(34, 35). Of further concern related to beverage behaviors, issues of water quality (e.g. metals, siltation, pathogens, and nutrients) and water treatments have been a long-standing concern for residents in this agriculture and mining region(36).

In our previous cross-sectional study of southwest Virginia residents, we quantitatively explored the utility of the TPB to explain SSB consumption. SSB intake averaged 457 (S.D. =430) kilocalories/day(37) an amount that exceeds recommendations for daily SSB intake by approximately four times(38). The amount of variability (38%) explained by the primary constructs of the TPB indicated that behavioral intentions, perceived behavioral control, subjective norms, and attitudes provided a moderate explanation for SSB intake(37). While this study reveals promise in the utility of the TPB to explain SSB behaviors, it also highlighted the need for further qualitative investigation of beliefs surrounding SSB consumption.

This current study served as the formative phase to further explore the usefulness of a TPB-guided framework to understand and intervene on SSB behaviors. Using both a deductive and inductive analysis process, the primary purpose of this theory-grounded research was to qualitatively explore the attitudes, subjective norms, and perceived behavioral control related to beverage behaviors including SSB, water, and artificially sweetened beverages among residents in southwest Virginia. Regional water quality issues also prompted the investigation of examining potential differences between individuals with primary access to city versus non-city water. The long-term goal of this work is to apply findings for the development and implementation of culturally specific behavioral strategies and interventions for reducing SSB intake among Appalachian residents.

## Methods

### Study Design and Recruitment

The Institutional Review Board at (blinded for review) approved this study and all participants provided informed signed consent. This study consisted of a screening questionnaire and focus groups. Participants were recruited from five southwest Virginia counties including Scott, Washington, Stuart, Giles and Floyd. A homogenous sampling protocol was executed(9). Eligibility criteria included residency in one of the targeted five counties, English speaking, 18 years of age, and consumption of 1 cup of SSB per day. Since focus groups were planned to evaluate potential differences among residents on city water versus non-city water sources (e.g. well, stream), participants also had to meet water source eligibility for the focus group being planned in their county. Socioeconomic status was not an inclusion criterion; however, the sampling goal was to achieve a broad variation across income and education levels. Three Virginia Cooperative Extension (VCE) educators and two graduate research assistants helped recruit and screen participants. Flyers and word of mouth were used to recruit participants through a several venues including VCE programs, churches, and low-income and subsidized housing sites. Focus groups were conducted August 2010-March 2011. A meal was served at each focus group and individuals were compensated with a \$30 gift card.

## Questionnaire

**Beverage consumption and water source**—Eligibility for consuming 1 cup of sugar-sweetened beverages per day was determined using three items from the valid and reliable Beverage Questionnaire including regular soft drinks, sweetened tea, and sweetened juice beverages/drink (e.g. fruit aids, lemonade, punch or Sunny Delight)(39). For each item participants indicated frequency of intake and portion size consumed. Participants also reported their primary source of drinking water.

**Demographic variables**—Demographic variables included gender, race/ethnicity, age, highest level of education reported across seven categories, and income level reported across 12 categories of \$5,000 increments. Participants also completed a validated health literacy assessment, the Newest Vital Sign, whereby participants view information on a nutrition label and answer six questions about how they would interpret and act on the information(40).

## Focus Groups

Planning of the focus groups, development of the script, and the moderation of focus groups were implemented according to suggested procedures(41). Each focus group included 5–9 participants, lasted about 90 minutes, and was led by an experienced moderator and co-moderator. In total three individuals assisted in the moderation, one of which moderated or co-moderated all eight focus groups. A semi-structured script containing open-ended questions and probes guided data collection. The script was grounded by the TPB constructs (i.e. attitudes, subjective norms, perceived behavioral control, and intention) and was formatted with explicit sections to prompt opinions about SSB, water, and artificially sweetened beverages (Table 1). Evidence from the Beverage Guidance Panel was used as recommended amounts from each beverage category (i.e. 0–8 fluid ounces/day of calorically sweetened beverages without nutrients, 20–50 fluid ounces/day of water, 0–32 fluid ounces/day noncalorically sweetened beverages)(38). Researchers presented a preliminary introduction to types of beverages and recommended amounts were given. The focus groups were audio recorded and transcribed verbatim. The study was designed to achieve data saturation, which was sufficiently achieved after eight focus groups, including four city water and four non-city water focus groups.

## Data Analysis

The quantitative data were analyzed in PASW Statistics (version 18.0, 2009, SPSS Inc., Chicago, IL) and included frequencies, means, standard deviations, Chi-squared and one-way ANOVAs. A hybrid deductive and inductive qualitative analysis approach was used(42–44). Utilizing a TPB-guided script and a priori coding of the data back to the TPB illustrates a deductive approach, while the generation of themes and sub-themes from the meaning units illustrates an inductive approach. Meaning units (MU) are defined as the constellation of words or statements that relate to the same central meaning and can also be referred to as a content unit or coding unit, a keyword and phrase, and a unit of analysis(42). With oversight from the primary investigator and using an inductive approach, two graduate research assistants thoroughly read the transcripts several times and independently generated initial key themes and sub-themes throughout the transcripts, and then met to resolve discrepancies and develop a distinct coding system. Then, three graduate research assistants independently identified meaning units (MU) throughout each transcript that supported the initial themes and met with the primary investigator to gain consensus on coding. Meaning units were assigned by the number of mentions. In an iterative process, the research team further reduced the MU into meaningful themes and sub-themes and then organized the MU back into TPB constructs. Congruent with qualitative content analysis, it is important to note

that our analysis was not a linear process(43, 44). Finally, to illustrate data saturation across each theme, the total number of MU were quantified(42). Quantification of MU do not necessarily reflect the associated value, importance, or emotion across themes and sub-themes. To illustrate credibility and trustworthiness of the analysis process(43), sample authentic quotes are provided in Figures 1–3. Upon analyzing the data, there were no noteworthy differences among residents on city versus non-city water sources. Therefore, the data were collapsed and results are subsequently reported across all eight focus groups.

## Results

### Participants

In total, 75 individuals were screened, of which 63 were eligible and 54 participated; 86% participation rate. Ineligible participants included eight who consumed <1 cup of SSB/day and four who consumed enough SSB to qualify but yet were not eligible due their primary water source. Nine eligible individuals chose not to participate (e.g. transportation, scheduling). Chi-squared and one-way ANOVA tests revealed no significant differences among the participants and non-participants. Table 2 details the gender, race/ethnicity, educational attainment, income level, and health literacy status of participants. A relatively balanced range of income and education levels were achieved, yet men were somewhat underrepresented in the sample. Since the targeted southwest Virginia region is 95% White(30), the race/ethnicity of the participants was representative of the area. Among participants, SSB consumption averaged 27.3 (SD=23.3) ounces per day.

### Focus Group Results

#### Sugar-sweetened beverages

**Attitudes:** Numerous positive and negative attitudes were revealed (Figure 1). When asked about the good things associated with SSB (i.e. soda, energy drinks, juice drinks), the majority of comments related to positive beverage attributes (n= 97 MU). Within this category the three most frequently identified sub-categories included taste (n= 38 MU) caffeine/energy (n= 31 MU), and vitamins (n= 12 MU). The remaining sub-categories consisted of electrolytes, high water content, novelty, not as much sugar, and antioxidants. Two positive health outcomes comprising 19 MU were noted; including helps when sick (n= 10 MU) and quenches thirst (n= 9 MU). Cost was discussed as both a positive quality of SSB (n= 6 MU), especially in reference to juice drinks, as well as a negative aspect (n= 3 MU).

There were also numerous negative statements that emerged about SSB. Of the identified negative SSB attributes (n= 78 MU), 22 MUs were about the sugar content and this appeared in all eight focus group. Caffeine (n= 21 MU), taste (n= 13 MU), and acidity (n=12 MU) were also common subcategories. Related to the 25 negative health outcomes, cavities emerged as the top negative health outcomes associated with SBB. The remaining 19 MUs fell under weight, more thirsty, indigestion, kidney problems, diabetes, makes kids hyper, heart trouble, bone loss and need to use the restroom, which were mentioned in 2 focus groups.

**Subjective Norms:** When questioned how they felt about the recommendation for drinking 8 ounces/day of SSB, only a few responses (n= 4 MU) suggested that individuals were likely to follow this recommendation. Seven responses indicated a more neutral view as participants thought it was a good recommendation, but would be hard to follow. A large majority of responses indicated unlikeliness to meet the recommendation (n= 16 MU). When considering normative beliefs, doctor recommendation (n= MU 11) and peers (n= 3 MU) emerged as important influences on the amount of SSB consumed.

**Perceived Behavioral Control:** The major obstacles participants identified related to what would make it hard to limit their SSB consumption included the availability and convenience of SSB (n= 14 MU), the size of cans (n= 12 MU), and cost (n= 12 MU) were among. Taste and disliking alternatives provided 7 additional MUs. Although participants provided numerous obstacles for limiting SSB consumption, the only consistent idea when discussing what would make it easy to limit SSB intake included increasing the availability and convenience of other beverages (n= 18 MU).

**Intention:** Intentions about meeting the recommendation for SSB over the next month were mixed, as some participants (n= 12 MU) indicated that it would be impossible while others illustrated plans to meet the recommendation (n= 7 MU). Some participants held a more neutral view (n= 9 MU), as one participant said, “*I think I would have to attempt it and let you know.*” Participants expressed ways to meet this goal, such as to drink more water (n= 8 MU) and replace SSB with healthier options (n= 5 MU). The remaining MUs reflect strategies such as gradually decrease SSB consumption, drink small amounts of SSB throughout the day, limit availability of SSB, quit cold turkey, and buy real fruit juice.

## Water

**Attitudes:** When asked about the good things associated with water, positive health outcomes was the prominent theme (n= 47 MU) (Figure 2). Sub-categories included helps your body, flushes kidneys, keeps you hydrated, refreshing, and helps metabolism. Among the 14 positive beverage attributes, taste was a commonly mentioned beverage attribute with 8 MUs. Cost was also mentioned as a positive aspect of water (n= 4 MU). Numerous participants expressed negative issues related to water (n= 41), including chemicals or contamination of water sources. One mother on city water mentioned, “*Those letters we get from the health department, they’re really scary.*” Taste, a negative beverage attribute, was also consistent among focus groups (n= 20 MU). Negative health consequences also emerged (n= 20 MU) with frequent responses including health complications associated with drinking too much water and perceptions that cancer is related to water intake. In addition, numerous participants mentioned cost as a negative aspect of water (n= 5 MU), which frequently related to bottled water.

**Subjective Norms:** More than half of the meaning units (n= 17 MU) suggested participants met the recommendations to drink 5–8 cups of water per day. Whereas some participants said they sometimes met the recommendation (n= 7 MU), and other said they did not meet the recommendation (n= 9 MU). Unlike SSB, normative beliefs did not emerge in reference to water.

**Perceived Behavioral Control:** When questioned what would make it hard to increase their water consumption, some responses related to negative beverage attributes (n= 5 MU). Some participants also stated the availability of other options made it difficult to consume the recommended amount of water (n= 7 MU). Many individuals expressed a more neutral attitude, saying that it depended on the availability of their preferred water source (n= 9 MU). In addition, the availability and convenience of water (n= 16 MU) made it easy for many participants to consume the recommended amount of water.

**Intention:** Very few participants responded about their intentions to meet the recommendation for water over the next month. Ten MUs were provided for individuals intending to meet the recommendation, while five people said they already meet the recommendation. No one voiced that they did not intend to meet this recommendation. Ways to consume more water provided 15 MUs including replace SSB with water, increase availability of water, measure water consumption, and limit availability of SSB.

### Artificially sweetened beverages

**Attitudes:** When discussing the good things associated with artificially sweetened beverages, participant responses focused on positive beverage attributes (Figure 3). Sub-categories included less calories/sugar (n= 16 MU), taste (n= 14 MU), and caffeine (n= 2 MU). Positive health benefits (n= 12 MU) were also discussed. Related to the bad things associated with artificially sweetened beverages, negative health consequences were reported across all focus groups, with cancer being frequently mentioned (MU= 15). Taste was a common sub-category of negative beverage attributes, with 13 MUs.

**Subjective Norms:** The majority of MUs confirmed participants would be likely to meet the recommendation to drink 32 ounces or less of artificially sweetened beverages a day (n= 38 MU). However, some MUs (n= 6) revealed uncertainty about the recommendation and several comments (n= 5 MU) displayed that participants were not likely to meet the recommendation. Similar to SSB, doctor's influence emerged as a normative belief (n= 11 MU), as individuals stated their consumption of artificially sweetened beverages would be determined by their doctor's advice.

**Perceived Behavioral Control:** Themes such as positive beverage attributes (n= 7 MU), availability of artificially sweetened beverages (n= 4 MU), cost (n= 2 MU), and bottle size (n= 2 MU) emerged related to difficulty in meeting the recommendations for artificially sweetened beverages. When asked what would make it easy to meet artificially sweetened beverage recommendations, the 10 MUs were spread across categories, as participants mentioned knowledge, negative beverage attributes, specifically taste, and negative health outcomes.

**Intention:** There were few responses when inquiries made about participant's intentions to meet this recommendation in the next month. Four MUs were provided for participants who already meet the recommendation, with no additional comments from individuals who did not meet the recommendation, although participants noted limiting availability as a way to decrease artificially sweetened beverage intake (n= 6 MU). A little more than half of the individuals said they would not be willing to replacing regular soda with diet soda (n= 16 MU), as one participant expressed, "*I would just quit all together instead of drinking diet.*" Of the responses, almost half (n= 13 MU) indicated that participants would be willing to replace sugary drinks with diet drinks. However, many said not until they felt like they had to. For example, one woman said, "*I would, like if I ever became a diabetic of something like that.*"

### Non-specific beverage themes

In addition to themes and MUs specific to individual beverages, there were other important themes identified that were not directly linked to SSB, water, or artificially sweetened beverages. For example, time of day (n=37 MU) was a notable influence on personal beverage choices. Certain foods (n= 11 MU) and locations (n= 5 MU) also emerged, as participants noted they were more likely to consume a particular drink depending on what food they were eating, and were more likely to consume a SSB when going out to eat. Furthermore, the majority of MUs indicated that drink patterns were different on the weekends (n= 30 MU).

When probed about friends and family, the majority of responses (N= 27 MU) indicated that it was not important to drink the same drinks as their friends and family. However, when asked about who or what influences their drink choices, members of the household (n= 19 MU) was a very prominent theme. When questioned what influenced the beverage choices

of their family and friends, emerging themes included availability or convenience of a drink (n= 18 MU), taste (n= 22 MU), caffeine (n= 21 MU) and health concerns (n= 26 MU).

Furthermore, habit was a common theme that emerged (n= 57 MU) across the focus groups. One participant said, “*I just like drinking coffee and soda pop. I drank it ever since I was a kid, so it’s just something, that I’ve gotten used to.*”

## Discussion

This is the first study, to our knowledge, that qualitatively explores beverage behaviors among adults using the TPB. Collectively, these findings provide unique insight to better understand the cultural beliefs associated with beverage behaviors. Across all the beverage categories and theory-grounded questions, the most notable themes that emerged included taste (n= 161 MU), availability/convenience (n= 95 MU), habit/addiction (n=57 MU), and cost (n= 28 MU). While the number meaning units varied substantially across these themes, these issues jointly emerged as the most important to address in program planning. Although fewer meaning units were revealed for health consequences, water quality, and normative beliefs among peers and doctors, the value placed on these themes by participants also highlight them as important factors influencing SSB behaviors.

As previously summarized, the TPB has broad utility for all phases of behavioral research across a wide range of health outcomes, yet there are obvious deficits in the empirical literature for qualitatively applying the TPB in the formative phases for the development of nutrition intervention studies (9–28). Of two known nutrition related TPB qualitative studies in adults, one focused on fruit and vegetable consumption among 29 Caucasian Dutch adults and identified six major influences on the consumption of fruits and vegetables including satisfaction, health consequences, social influences, habit, abilities and barriers, and awareness(27). The other study examined eating and dietary behaviors among 17 overweight and obese Spanish women enrolled in a weight loss treatment program and found a wide range of TPB beliefs to incorporate in programming planning including creating a more positive attitude towards dieting, the normative beliefs and perceived pressure in follow-up visits, positive beliefs related to social support, and the need to address willpower to overcome temptations(28). Other qualitative studies exploring beverage behaviors have focused on youth or college age populations(45–48). Hence our ability to draw distinct comparisons between our qualitative beverage findings to adult populations across other cultures or regions are limited.

It is important to recognize that views and cultural perspectives of medically underserved areas, such as the southwest Virginia region of Appalachia, are less likely to be represented in mainstream industry- or government-funded consumer group reports focusing on food and beverage behaviors. As one example, although the Dietary Guidelines had focus groups to assist in the development of consumer messages, the individuals in these focus groups represented 4 large urban U.S. cities(49). While these reports are useful in identifying the general beliefs associated with food and beverage behaviors, they often lack specificity on cultural and regional factors that are needed for program planning. Popular media have depicted the unique aspects surrounding sugary beverage behaviors in Appalachia(50, 51). The term ‘Mountain Dew Mouth’ has been coined as a prominent health problem in this region due to unchecked consumption of sugary foods and beverages combined with insufficient dental care and lack of dietary and dental education. These cumulative risk factors have led to significantly higher rates of tooth decay and tooth loss. Combined with alarming rates of obesity and diabetes in this region, the importance of understanding and intervening on modifiable SSB behavior are evident.



Of the prior TPB studies that have examined SSB consumption, all have been cross-sectional quantitative studies targeting adolescents(16–19). Since no known behavioral intervention studies have been designed, a priori, to target changes in SSB intake among adult populations(52–54), translating our theory-guided formative data into intervention strategies will be important. This formative study capitalizes on the collective body of literature and recommendations urging health educators and researchers to comprehensively and explicitly apply the behavioral theory to all intervention phases(13, 14). Utilizing this elicitation phase to better understand the attitudinal, normative, and control beliefs associated with beverage behaviors will support of our long-term goal to apply these findings for the development and implementation of culturally specific behavioral strategies and interventions for reducing SSB intake among Appalachian residents. For example, our work revealed some very specific strategies that should be incorporated into future program planning such as: providing participants an opportunity to taste different beverages, incorporating strategies aimed at cost savings and cost comparison across different beverage choices, debunking media-driven myths pertaining to beverages, using clear communication strategies to convey convincing evidence-based recommendations regarding the health benefits and consequences across all beverage categories, addressing safe water strategies, addressing normative beliefs in regards to both doctors and peers, and encouraging gradual reductions in SSB to avoid behavioral relapse and adverse side-effects such as caffeine withdrawals.

While this study uses a rigorous qualitative approach and fills a gap in the literature on understanding the underlying behavioral beliefs related to beverage consumption, there were several limitations. This study was conceptualized to identify potential differences among residents on city water versus non-city water sources, yet no meaningful differences emerged. We discovered that most participants had exposure to and use of multiple city and non-city water sources (e.g. home, work, homes of friends/family, eating away from home) and that participants generally preferred their home source of water regardless if it were city or non-city water. These two findings provide insight into why no noteworthy differences among TPB constructs were found among participants on city versus non-city water sources. Furthermore, due to the focused region in which this study was conducted, it may not be reasonable to generalize the results to other geographical regions.

Although this study has laid the groundwork for future efforts to reduce SSB consumption in southwest Virginia, additional research is needed. As previously mentioned, intervention research is needed to evaluate if a TPB-guided intervention can achieve sustained reductions in SSB consumption. Future research should also apply a broader socio-ecological model to understand other factors that influence beverage choices. The socio-ecological model proposes that behaviors are influenced by the interaction between an individual and their environment, including interpersonal, organizational, community and policy level factors(55). This model has been widely used in health promotion and public health initiatives, including dietary behaviors(55). The socio-ecological model can inform multilevel influences on SSB consumption such as the family environment(56), built environment(57), media(58), and policy (19, 59). In concert with individual level intervention approaches aimed at decreasing the consumption of SSB, it is apparent that initiatives must also consider broader social, community, environmental, and policy level factors. Related more specifically to qualitative approaches aimed at exploring beverage behaviors, future studies should also consider research designs and analytical approaches to explore differences among demographic characteristics (e.g. gender, race/ethnicity, age, income, education) as well as explicitly examine TPB constructs related to other more healthful beverage choices (e.g. milk) that could replace SSB.

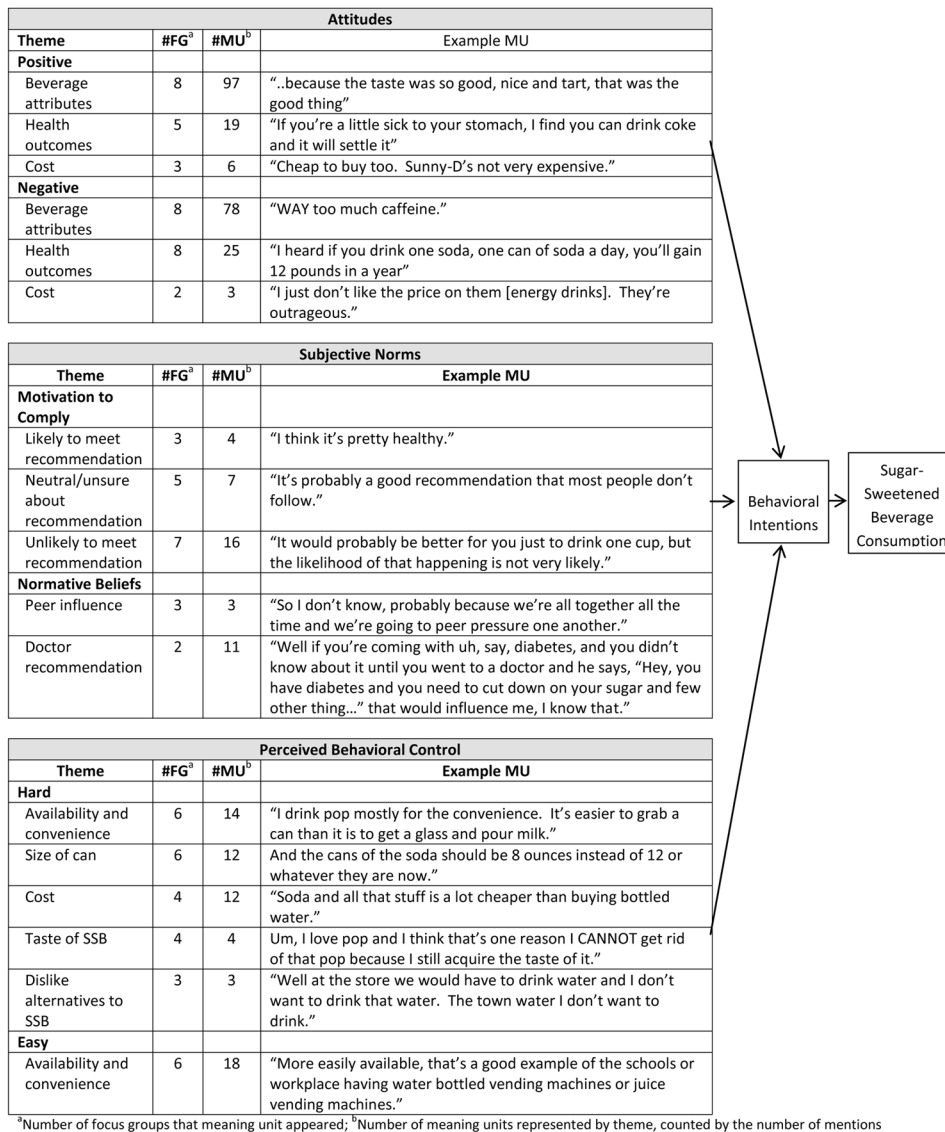
In conclusion, the TPB provided a useful framework for exploring major determinants of beverage consumption patterns and identifying key intervention messages to aid in program planning aimed at reducing SSB intake among southwest Virginia residents in the Appalachia region. To better understand culturally specific behavioral strategies and to help guide program planning efforts, dietetic professionals should consider theory-grounded qualitative approaches in the formative phase of research.

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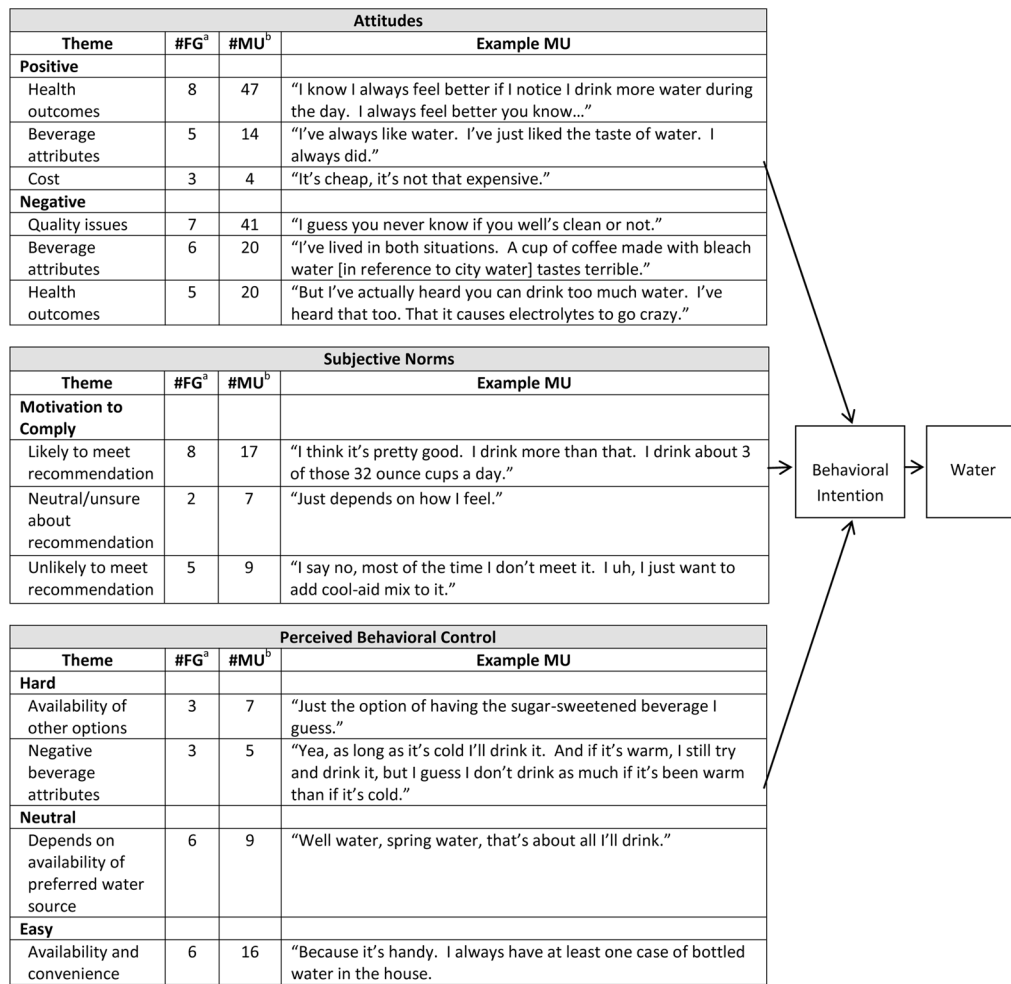
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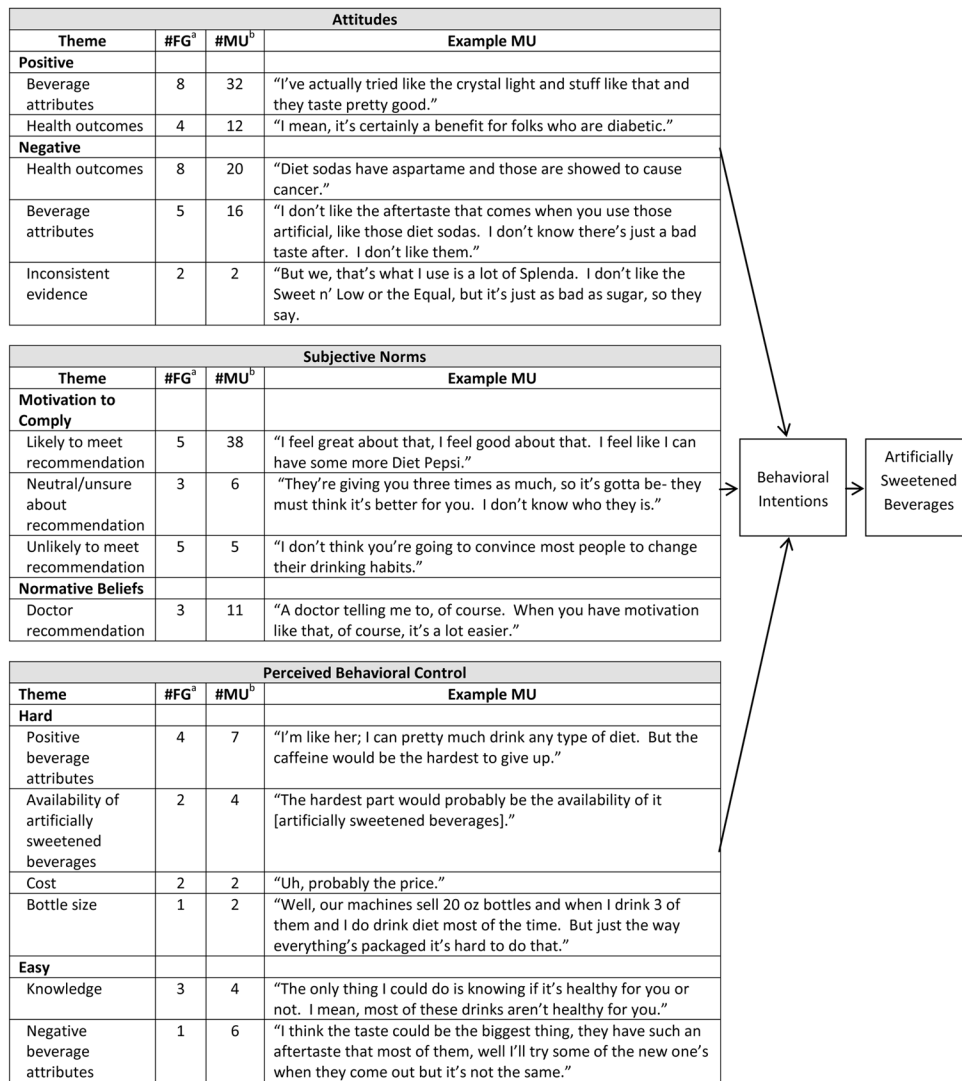


**Figure 1.** Sugar-sweetened beverage (SSB) consumption: Emergent themes across Theory of Planned Behavior constructs, meaning unit counts, and example quotes



<sup>a</sup>Number of focus groups that meaning unit appeared; <sup>b</sup>Number of meaning units represented by theme, counted by the number of mentions

**Figure 2.** Water consumption: Emergent themes across Theory of Planned Behavior constructs, meaning unit counts, and example quotes



<sup>a</sup>Number of focus groups that meaning unit appeared; <sup>b</sup>Number of meaning units represented by theme, counted by the number of mentions

**Figure 3.** Artificially sweetened beverage consumption: Emergent themes across Theory of Planned Behavior constructs, meaning unit counts, and example quotes

**Table 1**

Sample focus group questions grounded in the Theory of Planned Behavior<sup>a</sup>

| <b>Opening Questions, Non-Specific Beverages</b>   |   |
|--|---|
|  | To get us started, I want you to take a look of the paper in front of you. I would like you to look through the pictures of the different beverages and circle the beverages YOU most commonly drink. You can also add any beverages that are not shown on the paper. Also, please take some time to write down any feelings, thoughts, or draw any pictures that come to mind when thinking of these drinks. |
| Attitude   | Tell me about the feelings or thoughts that you associated with the drinks you consume most often.  |
| Subjective norms                                   | Tell me why it is or is not important that you drink the same amount or type of drinks as your friends and family.  |
| Perceived behavioral control                       | If you wanted to change the drinks you consume most, tell me what would make that hard or easy.   |
| <b>Sugar-Sweetened Beverage Specific Questions</b> |   |
|  | Now, we are going to turn our focus to only the drinks that have added sugar, or sugar-sweetened beverages. This includes regular sodas, energy or sports drinks, juices drinks such as Sunny delight, lemonade, punch, cool-aids; and sweet tea or coffee w/ sugar. This does NOT include diet drinks or any drinks sweetened with artificial sweeteners.  |
| Attitude   | Let's start with soda, tell me about the good things associated with drinking soda.   |
|  | Tell me about the bad things associated with drinking soda.   |
|  | Now let's move on to energy or sports drinks. Tell me about the good things associated with drinking energy or sports drinks.   |
|  | Tell me about the bad things associated with drinking energy or sports drinks.  |
|  | How about juice drinks like lemonade, sunny delight, Capri Sun, Koolaide. Tell me about the good things associated with drinking these juice drinks.  |
|  | Tell me about the bad things associated with drinking these juice drinks.   |
|  | And finally, how about coffee and/or tea with added table sugar (not sweetener packets). Tell me about the good things associated with drinking coffee and/or tea with added sugar.   |
| Subjective norms                                   | Tell me about the bad things associated with coffee and/or tea with added table sugar.  |
|  | Health professionals recommend that people drink 1 cup or less of sugar-sweetened beverages per day [SHOW PARTICIPANTS BEVERAGE MODELS]. Tell me how you feel about this recommendation.  |
|  | What would it take for someone to convince you and/or your family and friends that it is important to drink 1 cup or less of sugar-sweetened beverages per day?   |
| Behavioral intention                               | I want you to tell me about your intentions to meet the drink recommendation of 1 cup or less of sugar-sweetened beverages per day in the next month.   |
| Implementation intentions                          | If you intend to limit, what would your plan look like? When, where, and what drinks would you limit? (If you already meet the recommendation, talk about your plans to continue to meet this recommendation?)  |
| Perceived behavioral control                       | What makes it easy to drink 1 cup or less of sugar-sweetened beverages per day?   |
|  | What makes it hard drink 1 cup or less of sugar-sweetened beverages per day?  |
|  | What would you and/or your family and friends need to help meet this recommendation?  |

<sup>a</sup>Illustrated questions are meant to be representative of the focus script; they do not represent all the sections or questions within each section



**Table 2**

Characteristics of focus group participants (n = 54)

| <b>Demographic variables</b>                    | <b>n (%)</b> |
|---|--------------|
| <b>Gender</b>                                   |              |
| Male  | 21 (39%)     |
| Female  | 33 (61%)     |
| <b>Race</b>                                     |              |
| Non-Hispanic White                              | 52 (96%)     |
| African American                                | 2 (4%)       |
| <b>Education level</b>                          |              |
| Less than High school or GED                    | 7 (13%)      |
| High school or GED                              | 16 (30%)     |
| Some college or specialized training, no degree | 11 (20%)     |
| College degree                                  | 20 (37%)     |
| <b>Household income level</b>                   |              |
| \$14,999  | 22 (41%)     |
| \$15,000–\$34,999                               | 15 (28%)     |
| \$35,000  | 17 (31%)     |
| <b>Health literacy <sup>a</sup></b>             |              |
| High likelihood of limited literacy             | 10 (19%)     |
| Possibility of limited literacy                 | 13 (24%)     |
| Adequate literacy                               | 31 (57%)     |

<sup>a</sup> Assessed using the Newest Vital Sign with scores ranging 0–6; score of 0–1 suggests high likelihood of limited literacy, score of 2–3 indicates the possibility of limited literacy, score of 4–6 indicates adequate literacy (40)