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Development and Evaluation of the Sugar-Sweetened Beverages Media Literacy (SSB-ML) Scale and Its Relationship With SSB Consumption

Yvonnes Chen[a], **Kathleen J. Porter**[b], **Paul A. Estabrooks**[c], and **Jamie Zoellner**[b]

[a]William Allen White School of Journalism and Mass Communications, University of Kansas

[b]Department of Human Nutrition, Foods, and Exercise, Virginia Tech

[c]Department of Health Promotion, Social & Behavioral Health, University of Nebraska Medical Center

Abstract

Understanding how adults' media literacy skill sets impact their sugar-sweetened beverage (SSB) intake provides insight into designing effective interventions to enhance their critical analysis of marketing messages and thus improve their healthy beverage choices. However, a media literacy scale focusing on SSBs is lacking. This cross-sectional study uses baseline data from a large randomized controlled trial to (a) describe the psychometric properties of an SSB Media Literacy Scale (SSB-ML) scale and its subdomains, (b) examine how the scale varies across demographic variables, and (c) explain the scale's concurrent validity to predict SSB consumption. Results from 293 adults in rural southwestern Virginia (81.6% female, 94.0% White, 54.1% receiving SNAP and/or WIC benefits, average 410 SSB kcal daily) show that overall SSB-ML scale and its subdomains have strong internal consistencies (Cronbach's alphas ranging from 0.65 to 0.83). The Representation & Reality domain significantly predicted SSB kilocalories, after controlling for demographic variables. This study has implications for the assessment and inclusion of context-specific media literacy skills in behavioral interventions.

The food and beverage industry is known to target consumers through billion-dollar marketing efforts, including television advertisements, packaging, and promotional activities (Federal Trade Commission, 2008). These efforts use a variety of persuasion techniques without revealing the potential risks of the products (e.g., poor nutritional value and health impacts). These techniques, while effective in increasing product sales, can negatively impact consumers' understanding of the healthfulness of a product and contribute to poor eating and drinking habits that lead to long-term health consequences.

While the influence of marketing content on adults' health behaviors has not been as rigorously explored as it has been with children and adolescents (Harris & Bargh, 2009; Harris et al., 2014), early evidence suggests a disconnect between the established scientific knowledge and adult consumers' perceptions related to the healthfulness of food and

CONTACT Yvonnes Chen, PhD, yvonnes.chen@gmail.com, William Allen White School of Journalism and Mass Communications, University of Kansas, Stauffer–Flint Hall, 1435 Jayhawk Boulevard, Lawrence, KS 66045-7515.

beverages (Bogart, Cowgill, Sharma, Uyeda, Sticklor, Alijewicz, & Schuster, 2013; Hennessy, Bleakley, Piotrowski, Mallya, & Jordan, 2015). These perceptions may then impact consumers' food intake decision (Chandon & Wansink, 2006; Hennessy et al., 2015).

The impact of food and beverage marketing on consumers' unhealthy choices is especially a concern among low-income individuals, minorities, and rural communities. These individuals are disproportionately targeted by the food and beverage industry (Kumanyika & Grier, 2006; Park, Pan, Sherry, & Blanck, 2014; Yancy et al., 2009). Low-income individuals, for example, are more likely to see more ads that feature high-calorie, nutrient-dense food and beverages than their high-income counterparts (Kumanyika & Grier, 2006; Yancy et al., 2009). Understanding how members from these communities interpret marketing messages related to food and beverages may provide insight into ways to strengthen intervention design to mediate the industry's pervasive influences on consumption of unhealthy choices.

Link Between Media Literacy Skills and Behaviors

Media literacy skill sets are important to explore in an environment where individuals are consistently exposed to enticing and often unrealistic food and beverage promotional messages. Media literacy is defined as "an individual's ability to access to analyze, process, evaluate and produce media messages" (Aufderheide, 1993). Understanding the persuasive intent of media messages helps individuals analyze messages critically and thus empowers them to develop counterarguments to talk back to the media.

A meta-analysis has shown that health-promoting media literacy interventions are effective in improving key health decision-making and behavior indicators (Jeong, Cho, & Hwang, 2012). Cross-sectional studies also have demonstrated significant relationships between media literacy skills and smoking status (Primack, Sidani, Carroll, & Fine, 2009). For example, high school and college students who have a higher level of smoking media literacy were more likely to be nonsmokers and less susceptible to smoking (Primack, Gold, Land, & Fine, 2006; Primack et al., 2009).

To our knowledge, only one study has focused on adults' media literacy skill sets via a small-scale nutrition education intervention (Hindin, Contento, & Gussow, 2004). While the intervention effectively enhanced parents' knowledge of the persuasion techniques in television advertising and their understanding of truths versus claims, it did not assess their knowledge of the food and beverage industry's marketing activities.

Media Literacy and Sugar-Sweetened Beverages

Sugar-sweetened beverages (SSBs) (i.e., fruit drinks, soda, sports drinks, energy drinks) account for 7% of total energy intake in adults (Kit, Fakhouri, Park, Nielsen, & Ogden, 2013), and adults' frequent consumption of SSBs contributes to the development of obesity and other preventable health conditions (Institute of Medicine, 2012). SSB consumption is higher among low-income individuals, minorities, and rural communities (Alwitt & Donley, 1996; Ethan, Samuel, Basch, & Hammond, 2013; Han & Powell, 2013; Oza-Frank, Norton, Scarpetti, Wapner, & Conrey, 2011; Zoellner et al., 2012). For example, SSB intake is

ubiquitous in Appalachia adults, who consume three times more daily SSB kilocalories as compared to the national average (Kit et al., 2013; Zoellner et al., 2012).

SSBs are highly marketed; the beverage industry spent $1.6 billion to promote its products to consumers under the age of 18 years (Federal Trade Commission, 2008). Even though marketing expenditures targeted to adult consumers are unavailable, emerging evidence suggests a link between SSB advertising, perceptions of healthfulness of SSBs, and behaviors among adults. For example, adults' exposure to SSB ads impacts their personal and children's SSB intake (Harris & Bargh, 2009; Hennessy et al., 2015). Some parents are confused about the nutritional value of SSBs: viewing sport drinks, sweet tea, energy drinks, and even homemade sugary drinks as natural and healthy for their children (Bogart et al., 2013). These findings suggest a need to develop ways to assess media literacy skill sets related to SSB intake in adults for future interventions to reduce SSB intake and possible health risks.

Media Literacy Theoretical Frameworks

Existing media literacy theoretical frameworks provide insight into conceptualizing and developing a context-specific media literacy scale to assess SSB intake. Notable frameworks that have been used to examine relationships between media literacy skill sets and health behavior include the Message Interpretation Process Model (MIP) (Austin, 2006), the Media Health Literacy (MHL) (Levin-Zamir, Lemish, & Gofin, 2011), and antismoking media literacy (AML) (Primack et al., 2009). These frameworks follow the widely accepted definition of media literacy and share some overlapping concepts (e.g., the importance of media analysis and evaluation). Yet each offers slight variations in its operationalization of general and context-specific media literacy skill sets.

The MIP model—a cognitive-based psychological framework that has been primarily applied to an intervention context targeting children and adolescents—theorizes that individuals are persuaded by the desirability (e.g., appealing models) and positive expectancies (e.g., drinking this alcoholic beverage will bring positive outcomes) presented in advertising. The model also posits that strengthening individuals' logic-based indicators (e.g., perceived realism) will decrease their likelihood of perceived identification (e.g., identifying with the advertising characters). While the MIP model does not provide a context-specific media literacy scale, it has integrated general media literacy constructs, such as perceived media influences and skepticism, in its design and evaluation (e.g., Pinkleton, Austin, Chen, & Cohen, 2012; Pinkleton, Austin, Cohen, Chen, & Fitzgerald, 2008). The model has been used to assess media literacy interventions in the contexts of substance use prevention and sex education (e.g., Austin, Pinkleton, Hust, & Cohen, 2005; Kupersmidt, Scull, & Austin, 2010; Pinkleton et al., 2012).

Another media literacy model, MHL, emphasizes analysis and evaluation, and has been applied to exploring the relationships between media literacy skill sets and health behavior cross-sectionally with populations ranging from adolescents to college students (Levin-Zamir et al., 2011). A primary strength is its focus on promoting social actions and

advocacy, which can be achieved by increasing one's awareness of media messages, understanding the influences of health messages, and analyzing media content.

Developed by Primack and colleagues, AML focuses on various domains of media literacy skill sets: Authors & Audiences, Messages & Meanings, and Representation & Reality (Primack & Hobbs, 2009; Primack et al., 2009). These three domains progress from understanding media producers' intent and how specific audiences are targeted to make a profit (Authors & Audiences), to decoding explicit and implicit meanings and values embedded in media messages (Messages & Meanings), to discerning how well media messages reflect reality and omit important health information (Representation & Reality). Together they form a foundation for the development of a validated, context-specific media literacy scale—Smoking Media Literacy scale. This scale has most items relevant to tobacco marketing and a few general media literacy items that explore how individuals interpret and understand marketing messages. Validated with adolescent and young adults, the scale has demonstrated internal consistency, concurrent validity (i.e., association of the scale and its subdomains and decreased odds of smoking and susceptibility to smoking among adolescents and college students), and face and content validity (Arke & Primack, 2009; Primack, Gold, Switzer, et al., 2006). For the purpose of creating an SSB-specific media literacy scale, AML's validation record, context-specific nature, and use with young adults offer the best foundation for the development of an SSB-specific media literacy scale.

The goal of this study is to provide early evidence of the internal reliability and validity of an SSB-specific media literacy scale developed from AHL. Specifically, this study (a) describes the psychometric properties of the scale and its three subdomains, (b) examines how the scale varies across adults of various demographic characteristics, and (c) explains the scale's concurrent validity to predict SSB consumption in a rural adult sample from the Appalachian region of southwestern Virginia.

Methods

Study Design

This cross-sectional study utilized baseline data from participants in *Talking Health*, a health literacy-driven randomized controlled trial designed to reduce SSB intake among adults. Participants were recruited through active (e.g., trained community research assistants, Corporative Extension staff, trained research assistants) and passive (e.g., flyers, newspaper advertisement, postcards) strategies in an eight-county rural Appalachia region in southwest Virginia. Inclusion criteria included ≥18 years of age, English speaking, and consuming >200 SSB kcal/day.

The complete study methodology is presented elsewhere (Zoellner et al., 2014). This research was approved by the institutional review board. Prior to enrollment, participants provided written informed consent and were informed that they could withdraw at any time without punishment. To compensate for their time, participants received gift cards in the amount of $25 at baseline.

Participant Characteristics

Of the 301 adult participants enrolled in the baseline of the study, 8 were removed from subsequent analyses based on the boxplot of their SSB intake, resulting in a total of 293 participants. Of these remaining participants, the average age was 41.8 years (*SD* = 13.4, age range = 18–81). The majority of participants were female (81.6%) and White (93.5%). About one-third of participants had less than a high school education and 54.1% were receiving SNAP and/or WIC benefits. Approximately one-half of the participants were employed (50.5%) and more than two-thirds of them were insured (66.4%). Participants had an average SSB intake of 410 daily kcals (*SD* = 285, range = 0 to 1135). The majority of participants had adequate health literacy (*n* = 199, 67.9%) but one-third of the participants had relatively low health literacy (*n* = 94, 32.1%). Except for males being underrepresented, our participants' demographic characteristics are representative of populations from these regions based on the Census data (U.S. Census, 2010).

Data Collection and Measures

Trained research staff, following a standardized protocol, collected data pertaining to health and media literacy, SSB intake, and demographics at the baseline health assessment.

The SSB Media Literacy (SSB-ML) Scale

This18-item SSB-ML scale—administered using a laptop computer—includes three subdomains of media literacy framework: Authors & Audiences, Messages & Meanings, and Representation & Reality. The scale provides context-specific items (e.g., Sugary drink companies only care about making money) across three subdomains and general media awareness items (e.g., People are influenced by advertising) in Messages & Meanings and Representation & Reality.

The lead author, along with two PhD-level faculty members and two master's students, reviewed the original Antismoking Media Literacy Scale (Primack, Gold, Land, et al. 2006; Primack et al., 2009) and tailored questions to make the scale suitable for assessing SSBs-related skill sets. Most modifications were minor. For example, all terms specific to smoking, such as "cigarettes" and "tobacco," were changed to "sugary drinks." We modified the context from tobacco- to nutrition-related, including SSB-specific examples (e.g., Coke), ingredients (e.g., sugar), and risk factors (e.g., weight gain and diabetes). For example, the original item "Cigarette ads link smoking to natural things that humans want like love, good looks and power" was modified to "SSB ads link drinking these beverages to things people want, like love, good looks and power."

Two items were substantially modified from the original scale to reflect the different marketing practices between tobacco products and SSBs. However, we ensured that the modified items were theoretically consistent with aspect of the domain. One of the original items in the Messages & Meanings domain was modified to "Nutrition information is often hidden in SSB ads" from "There are often hidden messages in cigarette ads." The other item, from the Representation & Reality domain, was changed from "Cigarette ads show green, natural, healthy scenes to make people forget about the health risks" to "SSB ads show a healthy lifestyle to make people forget about the health risks, such as weight gain and

diabetes." We also modified the scale from a 4-point to a 7-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7). This was done to ensure consistencies across other measures used in the intervention study and to avoid confusion among participants. Finally, research staff examined the face and content validity of the SSB-ML through two rounds of revision. When pretesting the scale, the items and subscales performed well. See the Results section for the scale and its subdomains' psychometric properties.

Health Literacy

Measured with validated Newest Vital Sign (Weiss et al., 2005) and administered by trained research assistants, this health literacy instrument assesses participants' written, numeracy, and analytical skills using an ice cream nutritional panel label with six questions. Sample questions include: If you eat the entire container, how many calories will you eat? If you usually eat 2500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving? Is it safe for you to eat this ice cream? Using a standardized scoring procedure, participants were scored from 0 to 6. Participants were then categorized into health literacy levels based on their score: low (0–3) and high (4–6).

BEVQ-15

A validated instrument that measures participants' habitual SSB beverage intake using laptop, BEVQ-15 can be administered in approximately 2 minutes (Hedrick et al., 2012). This instrument assesses the frequency (never or less than 1 times per week to 3+ times a week) and amount of participants' beverage intake (less than 6 fl oz to more than 20 fl oz) in the past month. Example beverages include water, fruit and juice drinks, milk (plain and sweetened), soft drinks (regular and diet), and energy and sports drinks and so on. Daily SSB intake kilocalories are calculated from the frequency and intake amount.

Demographic Questions

Demographic questions, including age, sex, race/ethnicity, education level, income, and insurance, were included in the baseline survey.

Statistical Analysis

Statistical analyses were performed using SPSS v21 (IBM, 2012) with statistical significance designated at $p < .05$. To explore the first aim, the interitem reliability of the overall SSB-ML scale and its respective subdomains using Cronbach's alpha was calculated. Subsequently, an average of all questions to form an overall media literacy scale and an average score for each specific subdomain was calculated. To address the second aim, differences by demographic characteristics were explored using one-way analyses of variance (ANOVAs) with Tukey HSD post hoc analysis and independent samples *t*-test.

For the third aim, two regression analyses were used to explore the relationship between SSB-ML and SSB intake. The first regression model (Model 1) included overall SSB-ML as a predictor and SSB intake as a dependent variable, while controlling for demographic variables that have been found to predict SSB consumption (Davy et al., 2014; Kit et al., 2013; Park et al., 2014) in the first block. Considering that certain subdomains in prior research were strongly associated with behavior patterns, the second regression model

examined how the subdomains each uniquely impacted participants' SSB intake by controlling for demographic variables in the first step and entered the three subdomains in the second block (Model 2).

Results

Aim 1: The Modified Sugar-Sweetened Beverage Media Literacy Scale (SSB-ML) and Its Psychometric Properties

Cronbach's alpha for the overall scale and three subdomains are 0.89 for the overall scale, 0.65 for Authors & Audiences, 0.83 for Messages & Meanings, and 0.84 for Representation & Reality, demonstrating acceptable to strong levels of internal consistency scores. Although the Authors & Audiences alpha could be enhanced from 0.65 to 0.70 by deleting one item (i.e., When designing an ad campaign, sugary drink companies think very carefully about the people they want to buy their beverages), we chose to keep this item in keeping with the theoretical structure in prior established literature (Primack, Gold, Switzer, et al., 2006). Chronbach's alphas in the range of 0.5–0.7 are acceptable, given the pilot nature of this study (Churchill, 1979; Sax, 1997, p. 167; p. 167). See Table 1 for item descriptions and reliability scores. See Table 2 for correlation among the three subdomains.

Aim 2: SSB-ML across Demographic Characteristics

The average score across SSB-ML for all the participants was 5.89 ($SD = .79$). For specific subdomains, participants had a higher agreement with Messages & Meanings ($M = 6.18$, $SD = .69$), followed by Representation & Reality ($M = 5.80$, $SD = 1.05$) and Authors & Audiences ($M = 5.70$, $SD = .96$). No variation was found with regard to SSB-ML across demographic characteristics, including age, race, gender, education, employment status, insurance status, and health literacy. See Table 3.

Aim 3: SSB-ML's Association with SSB Intake

When including the overall SSB-ML scale in the regression model (Model 1), only age predicted SSB intake (see Table 4). Older participants were less likely to consume SSB. In Model 2, which included SSB-ML subdomains, results showed that age (beta = −.20, $p < .001$), education (beta = −.14, $p < .05$), and Representation & Reality (beta = −.24, $p < .01$) significantly predicted daily SSB intake in kilocalories. Older participants, participants with above a high school education, and participants with a higher level of Representation & Reality scores consumed less daily SSB kilocalories (see Model 2 in Table 4).

Discussion

This study presents the first known scale to use existing media literacy theory to comprehensively assess SSB-specific media literacy skills in adults. Findings suggest that the (SSB-ML) scale is valid and reliable among a rural Appalachian population that consumed high levels of SSBs.

By modifying an existing, validated smoking-specific and theory-based media literacy scale, we provided face and content validity to the SSB-ML scale. This scale and its respective

subdomains also have satisfactory internal consistency scores, demonstrating strong psychometric properties for the entire scale and each subdomain. Overall, participants had moderate agreement with SSB-ML statements and other subdomains, indicating that they had a general level of SSB-specific media literacy skill sets, including advertising awareness and persuasion techniques. Finally, Representation & Reality, a subdomain of SSB-ML, is negatively associated with SSB intake, suggesting a certain level of concurrent validity for the scale.

SSB-ML Across Demographic Characteristics

When looking at the distribution of media literacy skills across demographic characteristics, scores on the SSB-ML scale were similar across age, gender, race, education, employment status, insurance status, and health literacy. Given that prior adult media literacy has largely ignored health- and context-specific media literacy acquisition and skill sets among adults (Livingstone, Van Couvering, & Thumim, 2005), our finding adds new evidence to the literature.

The Relationship Between SSB-ML and SSB Intake

Representation & Reality and age and education were significantly associated with SSB intake. The significant association between age and SSB consumption is consistent with prior research (Davy et al., 2014; Kit et al., 2013; Park et al., 2014), confirming key information about who to recruit and target for behavioral interventions.

Moreover, a significant relationship between the Representation & Reality and SSB intake indicates the sub-domain's utility in assessing SSB intake. Adults scoring higher in this subdomain may be more skeptical toward the intention of SSB marketers—which, in turn, is associated with lower SSB consumption. It is likely that Representation & Reality captures a specific type of critical thinking skill that drives behavior, while the other two subdomains mainly focus on identification of marketing tricks and advertising intentions. This finding echoes results from prior tobacco media literacy with adolescents and college students in urban settings (Primack, Gold, Land, et al., 2006; Primack & Hobbs, 2009).

Furthermore, Representation & Reality's predictive ability and shared similarity with perceived realism in the MIP model further emphasize the importance of demystifying the media production process to highlight lack of accuracy in SSB messages. This finding has implications for including media literacy in behavioral interventions to reduce SSB intake. For instance, enhancing adult participants' understanding of Representation & Reality by asking critical questions in a constructive manner (e.g., What is missing in SSB ads? What health consequences are selectively represented in SSB ads?) may lead to behavior changes in the long run.

Limitations

This study is not without limitations. First, the study population was homogeneous in racial/ethnic and gender backgrounds. However, with the exception of underrepresented males, our sample demographic distribution is consistent with county demographic profiles, including low rates of education achievement and employment. Therefore, our research findings can

be generalized to areas where heavy consumption of SSBs is also observed. This is noteworthy, given the documented persuasive media targets by the beverage industry in rural, low-income communities (Alwitt & Donley, 1996; Ethan et al., 2013) and the excessive intake of SSB in certain parts of Appalachia (Zoellner et al., 2012). Second, the ways in which some items in the Authors & Audiences dimension are worded (e.g., the sugary drinks companies are powerful) may not adequately capture the purpose of the subdomain, which explores how authors target audiences for profits. Fine-tuning the subdomain may enhance its content validity. Third, given the cross-sectional nature of this study, causality between media literacy and SSB consumption cannot be inferred. Despite these limitations, this study provides meaningful insights, potential clinical assessment implications, and recommendations for SSB-based behavioral interventions and identifies necessary future directions for this research.

Study Implications and Next Steps

Overall, the SSB-ML scale could be a useful and effective tool for assessing SSB-specific media literacy skill sets among adults. The concurrent validity of Representation & Reality with SSB intake is quick and easy to administer if researchers are particularly interested in exploring the link between behavior and media literacy in their population of interest. Future research should further validate the SSB-ML scale in other populations also targeted by the beverage industry, including underserved populations, minorities, and children, to further understand skill set variations across different populations. Finally, our randomized controlled trial found improvements in SSB-ML scores and SSB consumption, when compared to the baseline data (Zoellner et al., 2016). Considering the link between the specific subdomain and behavior, future research is needed to further explore whether enhanced media literacy skill sets through effective behavioral interventions could mitigate the pathway between the beverage industry's persuasive intent and SSB consumption in population of interest.

Conclusion

This study contributed to the literature by first establishing an internally consistent assessment tool and describing media skills across an adult population. Our results suggest a relationship between media literacy and education. Representation & Reality, an important subdomain of SSB-ML, also has the potential as an assessment tool to predict consumption patterns. Strategies for health educators to consider include incorporating the developed SSB-ML scale as a diagnostic and evaluation tool and providing media literacy education to adults.

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Table 1

Media literacy subdomains and their reliability scores (Cronbach's alpha) at baseline.

Media literacy questions	**Cronbach's α (*n* = 293)**
Overall SSB-ML	0.89
Authors & Audiences: Assesses how SSB authors target specific audiences for profits	0.65
1. Grocery store or convenient store deals on sugary drinks, like buy-one-get-one free and other sales, are designed to get people addicted to sugar.	
2. Sugary drink companies are very powerful, even outside of the beverage business	
3. Sugary drink companies only care about making money	
4. Certain sugary drink brands are designed to appeal to people like me	
5. When designing an ad campaign, sugary drink companies think very carefully about the people they want to buy their beverages	
Messages & Meaning: Assesses participant agreement with the values, points of views and multiple production techniques SSB media messages contain	0.80
6. Wearing a shirt with a sugary drink logo on it makes you a walking advertisement	
7. Sugary drink ads link drinking these beverages to things people want, like love, good looks, and power	
8. Two people may see the same movie or TV show and get very different ideas about it.	
9. Different people can see the same sugary drink ad in a magazine and feel completely different about it.	
10. A sugary drink ad may catch one person's attention but not even be noticed by another person.	
11. People are influenced by TV and movies, whether they realize it or not.	
12. People are influenced by advertising.	
13. When people make movies and TV shows, every camera shot is very carefully planned.	
14. There are hidden messages in sugary drink ads.	
Representation & Reality: Assesses the extent to which SSB messages omit health and nutrition information	0.83
15. Most movies and TV shows that show people drinking sugary drinks make it look more attractive than it really is.	
16. Sugary drink ads show a healthy lifestyle to make people forget about the health risks, such as weight gain and diabetes.	
17. When you see a buy-one-get-one-free or other type of sugary drink sale, it's usually not actually a good deal in the long run.	
18. When you see a sugary drink ad, it is very important to think about what was left out of the ad.	
19. Advertisements usually leave out a lot of important information.	

Table 2

Correlation matrix among the three SSB-ML subdomains.

	Authors & Audiences	Messages & Meanings	Representation & Reality
Authors & Audiences	—	.64***	.63***
Messages & Meanings	.64***	—	.65***
Representation & Reality	.63***	.65***	—

*** $p < .001$.

Table 3

Demographic characteristics of enrolled participants at baseline and differences across three media literacy subdomains.

	All participants (n = 293), n (%)	Overall SSB-ML, mean (SD)	Authors & Audiences, mean (SD)	Messages & Meaning, mean (SD)	Representation & Reality, mean (SD)
Age (years)					
18–25	44 (15 %)	6.02 (.73)	5.83 (.89)	6.28 (.57)	5.94 (.96)
26–40	88 (30.0%)	5.80 (.79)	5.63 (.95)	6.12 (.72)	5.65 (1.08)
41–55	110 (37.5%)	5.82 (.84)	5.60 (.98)	6.10 (.76)	5.74 (1.12)
56–81	51 (17.4%)	6.12 (.67)	5.91 (.97)	6.38 (.54)	6.08 (.87)
Statistic (p value)		F(3, 287) = 2.59, (p = .05)	F(3, 287) = 1.62, (p = .19)	F(3, 287) = 2.36, (p = .07)	F(3, 287) = 2.19, (p = .09)
Gender					
Female	239 (81.6%)	5.92 (.74)	5.72 (.93)	6.21 (.63)	5.83 (1.00)
Male	54 (18.4%)	5.76 (.98)	5.60 (1.08)	6.05 (.92)	5.65 (1.25)
Statistic (p value)		t(289) = −1.34 (p = .18)	t(289) = −.86(p = .39)	t(289) = −1.61(p = .11)	t(289) = −1.17 (p = .24)
Race/ethnicity					
White	274 (93.5%)	5.89 (.77)	5.70 (.95)	6.19 (.66)	5.80 (1.04)
Other	19 (6.5%)	5.87 (1.07)	5.66 (1.10)	6.12 (1.06)	5.84 (1.28)
Statistic (p value)		t(289) = .11(p = .92)	t(289) = .17(p = .86)	t(289) = .41(p = .69)	t(289) = −.19(p = .85)
Education level					
< High school	90 (30.7%)	5.83 (.90)	5.60 (1.05)	6.06 (.85)	5.84 (1.12)
≥ High school	203 (69.3%)	5.92 (.73)	5.74 (.91)	6.23 (.61)	5.78 (1.02)
Statistic (p-value)		t(289) = −.88(p = .38)	t(289) = −1.20 (p = .23)	t(289) = −1.96 (p = .05)	t(289) = .40(p = .69)
Employment status					
Employed	148 (50.5%)	5.87 (.74)	5.65 (.88)	6.16 (.68)	5.78 (1.00)
Unemployed	33 (11.3%)	5.66 (.91)	5.42 (1.18)	6.00 (.82)	5.56 (1.20)
Other (homemaker, student, retired, unable to work)	112 (38.2%)	6.00 (.80)	5.85 (.97)	6.26 (.66)	5.90 (1.07)
Statistic (p value)		F(2, 288) = 2.61, p = .08	F(2, 288) = 2.97, p = .05	F(2, 288) = 1.90, p = .15	F(2, 288) = 1.33, p = .27
Insurance[a]					
Uninsured	98 (33.6%)	5.94 (.75)	5.73 (.95)	6.20 (.67)	5.91 (1.01)
Insured	194 (66.4%)	5.87 (.80)	5.69 (.97)	6.17 (.71)	5.75 (1.07)
Statistic (p value)		t(288) = .81(p = .42)	t(288) = .37(p = .71)	t(288) = .31(p = .76)	t(288) = 1.28 (p = .20)

	All participants (n = 293), n (%)	Overall SSB-ML, mean (SD)	Authors & Audiences, mean (SD)	Messages & Meaning, mean (SD)	Representation & Reality, mean (SD)
Health literacy[b]					
High health literacy	199 (67.9%)	5.82 (.97)	5.59 (1.06)	6.08 (.90)	5.79 (1.25)
Low health literacy	94 (32.1%)	5.93 (.69)	5.76 (.88)	6.23 (.59)	5.80 (.96)
Statistic (p value)		$t(253) = -1.00$ ($p = .32$)	$t(253) = -1.53$ ($p = .13$)	$t(253) = -.04$($p = .97$)	$t(253) = -1.34$ ($p = .18$)

Note. Age was measured as a continuous variable. Data were collapsed into four categories to simply the relationship between media literacy skill sets and age. Age remains to be a continuous measure in subsequent regression analysis. Education was measured as an ordinal variable with the following options: grades 0–8, grades 9–11, high school, some college, college graduate, and graduate school. Data were collapsed into two categories for this analysis. Employment status was measured with a 7-point scale. Data were collapsed into three categories for this study. SSB-ML stands for sugar-sweetened beverages media literacy.

[a]Missing data = 1.

[b]Missing data = 29.

Table 4

Regression models examining the relationship between SSB-ML, demographics, and SSB intake (kcal)

	Model 1			Model 2		
Predictor variables	**β (final model)**	***F***	***R*²**	**B (final model)**	***F***	***R*²**
Block 1						
Age	−.21***	8.57***	.06	−.20***	8.57***	.06
Education	−.11			−.14*		
		ΔR² = .00				ΔR² = .03*
Block 2						
Overall SSB-ML	−.05	6.00**	.06	—	—	—
Authors & Audiences	—	—	—	.08	5.28***	.09
Messages & Meanings	—	—	—	.11		
Representation & Reality	—	—	—	−.24**		

Note. Age was measured as a continuous variable. Education was measured as an ordinal variable with the following options: grades 0–8, grades 9–11, high school, some college, college graduate, and graduate school. SSB-ML stands for sugar-sweetened beverages media literacy. — Indicates variable not included in the model.

* $p < .05$;

** $p < .01$;

*** $p < .001$.