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Protocol: Effectiveness of message content and format on individual and collective efficacy in reducing the intention to consume sugar-sweetened beverages

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Abstract

The strategic use of media is a common approach to promote health. A large body of evidence identifies specific features that increase message efficacy, including tailoring messages to the target audience and using a storytelling format. Yet most message testing research has focused on individual-level outcomes, ignoring the social and environmental determinants of health behaviors, which require collective action and political will to change. Grounded in an ecological approach to communication, we will carry out two double-blinded randomized experiments to test the relative effectiveness of message tailoring (culturally-tailored vs. standard) and format (narrative vs. didactic) to increase the intention to reduce individual sugar-sweetened beverage consumption, the understanding of social and commercial determinants of health, and the sense of empowerment among young adult Latinas. Based on power analyses (80% power at alpha = 0.05), we will randomize 438 participants to two groups (traditional standard infographic and culturally-tailored infographic) in the first study, and 662 participants to two groups (culturally-tailored infographic and culturally-tailored comic book) in the second study. All participants will be measured by a pre-treatment test and an immediate post-treatment test. We hypothesize that culturally-tailored comic book will be most effective, and traditional standard infographic will be least effective, on all levels of outcomes. This study will provide empirical evidence in communication strategies to help young Latinos or other racial/ethnic minority young people to pursue positive dietary behaviors that both benefit themselves and contribute to change of social norms.

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Author contributions

All authors contributed to the study design and commented on the manuscript. MZ wrote the manuscript and developed the analysis plan; DS assisted with study design and theoretical conceptualization of the culturally-tailored messages; DC developed and pre-tested the outcome measures; MZ will manage data collection and cleaning; MZ and SH will conduct the data analyses; ASR conceptualized the study, obtained the funding, developed the theoretical framework, and will supervise the entire research process.

CRedit authorship contribution statement

Mi Zhou: Conceptualization, Methodology, Software, Writing – original draft. **Deepti Chittamuru:** Conceptualization, Investigation. **Sandie Ha:** Software, Validation. **Dean Schillinger:** Writing – review & editing. **A. Susana Ramírez:** Conceptualization, Methodology, Supervision.

Declaration of Competing Interest

The authors declare no competing interests.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.cct.2022.106711>.

Keywords

Cultural tailoring; Narrative; Individual behavior; Social changes; Sugar-sweetened beverages; Latinas

1. Introduction

Sugar-sweetened beverages (SSB), including sweetened carbonated drinks, sweetened fruit juices, energy or sports drinks, and sweetened coffee and tea, are the primary source of added sugar in the American diet [1,2]. SSB consumption has been associated with increased risk of serious chronic diseases such as obesity, diabetes, metabolic syndrome, and multiple cancers [3,4]. According to the findings from Bleich et al. [5] and Rosinger et al. [6,7] by analyzing the National Health and Nutrition Examination Survey data, nearly half of all adults and over half of youth ages 2 to 19 in the United States (U.S.) consume SSBs at least once per day, and young adults have the highest daily SSB intake compared to older adults and youth [6,7]. The same studies find that Latinos consume SSBs in greater quantities than Whites [7], contributing to the greater incidence of diet-related chronic diseases in this group [2,8].

Corporate investments in targeted marketing create compelling messages and environments for increasing consumption of SSBs. For example, food and beverage marketing efforts intentionally and disproportionately target Latino communities by incorporating ethnic cues or cultural symbols to resonate with Latino youth, especially those who have strong ethnic identity [9-12]. Young adults of color also are disproportionately targeted and influenced by SSB marketing, especially for energy drinks that are even more harmful than regular soda [13-15]. Moreover, young adults are less protected by government and industry self-regulated marketing policies [16]. Therefore, it is critical to empower Latino young adults to understand the social and commercial factors that have shaped their health disadvantages and to engage in changing social norms.

Effective communication is essential to address public health issues [17]. Two specific message features increase effectiveness: tailoring and storytelling structure. Message tailoring that aims to personalize messages based on demographic, social, cultural, psychological, or physical traits is considered an effective way to connect with the audience [18,19]. According to the elaboration likelihood model (ELM), tailored messages are more effective than standard messages by stimulating central route processing – leading to increased attention to the message – which in turn triggers more active information processing (elaboration) that results in increased retention of the messages and improves likelihood of persuasive effects [19-22]. Tailored messages that integrate identifiable ethnic cues, values, norms, and beliefs of the target groups have demonstrated more substantial and sustainable effects than standard messages about cancers and healthy dietary behaviors [23-26].

While message tailoring works by increasing attention to messages, the effectiveness of narrative messages (i.e., storytelling) is explained by the extended elaboration likelihood model (EELM). According to the EELM, stories work by transporting audiences into

scenes, by facilitating identification or a sense of similarity with characters, and by invoking emotional responses [27,28]. Narrative-based messaging is more effective than non-narrative messaging at increasing knowledge and changing related attitudes and behaviors in cancer prevention, alcohol reduction, and sexual and mental health promotion [29-34].

Messaging strategies have been well-recognized and applied, yet research examining the effectiveness of health communication has primarily focused on individual-level health behavior outcomes. This individualistic approach has limited potential impact because human behaviors like SSB consumption are highly influenced by social and commercial factors that are beyond any single individual's control [35,36]. The prominent public health framework, socio-ecological model, acknowledges the multi-level nature of health determinants and the implications of public health interventions at different levels [37]. However, the role of corporate or commercial factors has not been systematically incorporated into the conceptual framework for social determinants of health, which may obscure corporate responsibility for health [38]. Recently, researchers have specifically called out the role of industry in population health and health disparities, referring to their targeted advertising of junk foods, public relations efforts, product and store placement, and other marketing and policy strategies as the “corporate and commercial determinants of health” [39,40]. We thus sought to elaborate potential effects on individuals as related to their social and commercial environments.

The emerging concept of critical health literacy has linked the individually-focused communication interventions with collective social change. Measured on the individual level, critical health literacy assesses understanding of social and environmental determinants of health, ability to question the status quo, and the sense of power to engage in collective action for social and political change [36]. Critical health literacy has attracted attention in health promotion, but there is no agreement about how to operationalize the construct [41,42]. We argue that critical health literacy comprises several dimensions. Firstly, media literacy enables people to critical analysis of media content, to see through corporations' manipulations that bias their own and their communities' health choices [43]. In addition, public health literacy allows people to recognize that health outcomes are a function of larger social and environmental contexts beyond individual biology or choices [44]. Lastly, empowerment makes people critically analyze social, environmental and political circumstances and engage in change of social norms [36,45]. We thus propose that critical health literacy—the sum of these three components—can be considered a collective-level message effect.

The overarching goal of this study is to improve understanding of the mechanisms through which an ecological approach to message design influences individual behavioral intention and critical health literacy to reduce SSB consumption. There is evidence for the effectiveness of message content (tailored vs. standard) and format (narrative vs. didactic), but content and format have generally been tested separately as described above; therefore, the first aim of this study is to test the effects of both culturally-tailored messaging and narrative format. We will use group-level cultural cues to design the messages, but we recognize that individuals comprising the group vary on the adherence to their ethnic identity and values; therefore, the second aim of this study is to assess the moderating

effects of the strength of pre-held ethnic identity and social-cultural values. Research on the mechanisms by which message cues persuade has focused largely on narrative messages; few studies have compared narratives with non-narratives [27,46-48]. Therefore, our final aim is to assess the mediating effects of message persuasive cues across format.

We hypothesize that when content is presented in didactic format, culturally-tailored messages will be more effective than standard health promotion messages, and when both messages use culturally-tailored appeals, narrative format will be more effective than the usual care didactic format. We also hypothesize that the perceived effectiveness of culturally-tailored messages is moderated by the strength of pre-held socio-cultural values. Finally, we hypothesize that message persuasive cues positively predict the perceived effectiveness of messages, and the pre-held ethnic identity will moderate this association. A summary of research questions, hypotheses, sampling, analysis plan, and potential outcome interpretation is listed in supplementary Table 1.

2. Materials and methods

2.1. Study design

Grounded in an ecological approach to communication, we will test the effects of message content and format in two double-blinded randomized control trials. Experiment 1 will test the effectiveness of culturally-tailored vs. standard messages when both presented in didactic format. Infographics have been increasingly used in health promotion due to their concise, visual communication of information [49]. We will use an infographic incorporating Latino cultural cues as the culturally-tailored stimulus and a standard (not culturally-tailored) infographic as the standard stimulus. In experiment 2, we will test the relative effectiveness of narrative vs. didactic messages when both are culturally-tailored. Comic books, combining images and narrative text, are a culturally-consonant narrative form [34]. We will use the same culturally-tailored message from Experiment 1 as the didactic stimulus, and an information-equivalent comic book as the narrative stimulus. Outcome measures for both experiments will be the same.

2.2. Participants

Inclusion criteria are: 1) Young adult Latinas of Mexican origin living in the U.S.; 2) between 18 and 29 years; and 3) able to read and write in English. Recruitment criteria are based on theoretical and practical considerations. Firstly, young adult women play a core role in food purchase and preparation, which may influence dietary choices for their entire families [50]. In addition, dietary behaviors are highly associated with Mexican American identity and values [50]. Moreover, acculturation has been associated with less healthy dietary quality; among immigrants, rejection of traditional country-of-origin dietary patterns in favor of adoption of the less-healthy Standard American Diet has been used as an indicator of behavioral acculturation to “American” culture [50]. We thus argue that dietary interventions to improve Latino health must focus on more-acculturated Latinos. Consistent with prior studies, we consider English-language ability as a rough proxy to include participants with a higher level of acculturation and thus a higher risk of unhealthy diet. Finally, this study is part of a large ongoing project exploring strategies for nutrition

messaging (clinicaltrials.gov ID: NCT04352530). The goal of the larger project is to improve understanding of factors that influence Latinas' dietary behaviors as a primary prevention strategy for breast cancer. This current study focuses on Mexican American women, and we will draw study samples separately from the bigger project, which allows us to avoid selection bias.

We will collect the data through a professional research management company (company to be confirmed) that offers a web-based participant pool with pre-registered participants roughly representing the U.S. population. The platform can screen participants by different demographic features based on researchers' choices, and individuals cannot participate in each study more than once. Participants will need internet and a digital equipment to access the survey and basic English literacy to understand, consent and complete the study. Pew Research Center data show that more than 95% of Latinos between 18 and 29 years use internet and those who speak primarily English are more likely to be online [51]. We thus expect our participation requirements to result in a sample that largely represents the intended target population.

2.3. Interventions

2.3.1. Intervention stimulus identification and development—We identified stimuli from the universe of real-world messages to respond to typical experimental concerns about external validity. Following a process of evaluation by the research team, we selected the infographic titled “Added Sugar is not So Sweet” developed by American Heart Association (AHA) as the standard material for Experiment 1 [52] (Supplementary fig. 1). For the narrative message that will be used in Experiment 2 and the didactic culturally-tailored messages that will be used in both experiments, we were unable to identify ready-to-use materials. Therefore, we created the two culturally-tailored messages by adapting real-world materials, as described below.

The Bigger Picture (TBP) project is an award-winning diabetes prevention campaign launched by the University of California, San Francisco's Center for Vulnerable Populations in collaboration with the nonprofit organization Youth Speak [53]. The *TBP* project was a series of workshops among public health experts, poetry mentors and youth poets, and is grounded in the knowledge that including members from the target audience in message development is critical for designing messages intended to reduce health disparities [53]. These low-income and ethnically diverse youth artists of color were taught about the risk factors for diabetes: not just individual risk factors, but also the manipulative practices of the food industry. The poets then reframed the learned information into narrative poems and performed as actors in the videos that were transferred from their poets [53]. We selected the poem “A Taste of Home” for our narrative stimulus [54]. The poet, Monica Mendoza, vividly demonstrates how the beverage industry's deliberate, targeted marketing strategies have shaped the outsize role of sugary beverages in Mexican and Mexican American culture. The poem directly links the targeted marketing with the high rates of diabetes among Mexicans and Mexican Americans, with key cultural elements including Spanish-language cues, values of familism, respect, and sense of social justice represented in words and images. Our team of researchers worked with the poet and a comic book company to

develop a four-page comic book that is equivalent in content and imagery to the video (Supplementary fig. 2). For the final condition, the culturally-tailored didactic message, we adapted a publicly-available infographic about Latino children and sugary drinks produced by Salud America [55] (Supplementary fig. 3).

2.3.2. Intervention stimulus validation—Since the two culturally-tailored messages are not strictly real-world materials, to ensure that the key message features are perceived consistently by the target audience and researchers, we conducted a multi-step, multi-method validation. Once the internal team was satisfied with equivalency, in the second phase, we validated the messages with members of the target audience ($n = 19$) using an online survey. The final phase was an online focus group among 7 volunteers of these 19 participants to further explore the shared and distinct opinions regarding their understanding of the two messages. As a result of the research, to improve infographic equivalence to comic book, we added Spanish language cues and the value of respect to the infographic. After this modification, we are confident that the resulting infographic is perceived to have the same key information as the comic.

2.3.3. Intervention process—Since the culturally-tailored infographic will be used as the stimulus in both experiments, we will conduct the two experiments in parallel as if it were a three-arm experiment (Fig. 1). Invited participants from the research panel who are interested in our study will access the survey through a web link hosted by Qualtrics survey software (Qualtrics, Provo, UT). Participants will enter the survey interface after reading the consent form and confirming their participation.

We will first assess baseline measures of the intended outcomes: intention to reduce SSB consumption and critical health literacy. Pre-treatment questions also assess SSB intake, the strength of ethnic identity, and social-cultural values. Following pre-treatment questions, participants will be randomized to one of three experimental conditions. After the treatment, participants will answer questions about the message effect and persuasive cues, SSB consumption intention and critical health literacy questions for the second time, and finally, demographic measures. The entire study includes 150 questions, counting each row of a matrix as an independent question. Based on pilot testing with volunteers from the target population, we estimate the total time to completion of the study is 20–25 min, depending on treatment. Participants will be compensated in U.S. dollars, based on their agreed compensation rate with the research panel platform (not by researchers).

2.4. Outcomes

The conceptual framework guiding this study integrates the socio-ecological model with the EELM (Fig. 2). We propose that compared with standard messages, culturally-tailored messages generate greater perceived effectiveness, individual intention to reduce SSB, and improved critical health literacy and the effect is higher in the narrative condition. The perceived effectiveness of narrative messages is mediated through transportation, identification with characters, and emotional response, while the perceived effectiveness of didactic messages is mediated through the elaboration of arguments. Further, we propose that the strength of self-held socio-cultural values moderates the treatment effect

of culturally-tailored messages on perceived effectiveness and the strength of ethnic identity modifies the association between message format and message persuasive cues. Greater perceived effectiveness leads to greater individual behavior intention to reduce SSB and improved critical health literacy. We then designed the survey instrument (Table 1) based on the conceptual framework by adapting previously validated measures.

2.5. Sample size

We determined the sample size from a series of analyses using G*Power version 3.1 (University of Passau, Passau, Germany, 2016) and will choose the largest recommended sample. The effect sizes estimation process followed three steps: 1) our other ongoing experiments that tested other features of nutrition messages but measured similar outcomes [72]; 2) The existing literature; and 3) Cohen's conventional small effect size (i.e. $d = 0.2$, 0.5 or 0.8 represents a small, medium or large effect, respectively) that can be converted to different values based on different methods of statistical analyses [73]. We will fit multiple linear regressions for the primary outcome analyses, so the power analyses were conducted based on regression statistics, and effect size values were reported as Cohen f^2 indicated by G*Power.

For experiment 1, the effect size to test a difference in perceived effectiveness between the cultural values-based and fear-based videos from the other ongoing studies of the larger project was calculated as $f^2 = 0.10$, and the average effect size to test a difference of collective level outcomes between the two types of messages was calculated as $f^2 = 0.04$.⁴⁴ However, this study did not show a statistically significant difference for individual SSB intention between the two groups, so we used the effect size reported in Bryan et al. [24] regarding the SSB consumption intention difference between adolescent participants in the culturally-tailored group and the control group. The effect size value is Cohen $f^2 = 0.03$, which was converted from the reported Cohen d value. Therefore, the smallest effect size for culturally-tailored vs. standard messages is $f^2 = 0.03$, which requires us to enroll a sample size of $n = 398$ to provide a statistical power of 80% at $\alpha = 0.05$.

For experiment 2, our other ongoing experiments have not tested message format features, and we were not able to find any statistically appropriate effect sizes that compared the effectiveness of narrative versus didactic messages in reducing SSB consumption and social empowerment. Therefore, we used the conventional small effect size $f^2 = 0.02$ for all three primary outcomes in this regard. The effect size $f^2 = 0.02$ for narrative vs. didactic messages requires us to enroll a sample size of $n = 602$ to provide a statistical power of 80% at $\alpha = 0.05$. The detailed power analyses are described in the supplementary Table 1. Accounting for 10% attrition, the required total sample size would be 1100 (438 in experiment 1 and 662 in experiment 2). The three-arm design allows us only to need 881 participants (explained below).

2.6. Randomization

The randomization was automatically processed in Qualtrics by setting up the randomizer in the survey flow with presetting quotas. We will first randomize people into three arms until we get 219 for each condition to meet the required sample size for experiment 1. After that,

we will randomize more people into the two groups of experiment 2 until we get 331 for each group to meet the required sample size. Even though it is a non-standard randomization approach, it allows us to ensure that participants for each experiment will have equal chances to be randomized into any of the two treatment groups of each experiment. Study investigators and participants were both blinded to treatment allocation.

2.7. Statistical methods

We will use descriptive statistics to summarize participants' characteristics at baseline. The dependent variable will be the message effect outcomes and the individual intention and collective level outcomes. The main explanatory variables are the various treatment conditions. Data analyses will include multiple steps to test different hypotheses. We will use baseline SSB intention and critical health literacy score, baseline SSB intake, and social economic status as covariates to adjusted general linear regression model to test the difference in main treatment effect of culturally-tailored vs standard in experiment 1 and narrative vs. didactic messages in experiment 2 on different levels of outcomes. Both individual outcome and index outcome that calculated by averaging or adding up individual outcomes will be tested. In experiment 1, we will also conduct path analysis to build linear regression models to test the moderation effect of the pre-held socio and cultural values on the relationship between message content (culturally-tailored or not) and messages perceived effectiveness. In experiment 2, not all questions regarding message persuasive cues will be answered by both groups since it makes no sense for the didactic group to ask message transportation and character identification questions (Table 1 and Supplementary Table 1); therefore, we are not able to literally test the mediating effect of message persuasive cues on the relationship between message format and (narrative or not) and the message perceived effectiveness; instead, we will build linear regression models to test the predicting effects of the narrative or didactic persuasive cues on the message perceived effectiveness, respectively. For the same reason, we are not able to literally test the moderation effect of ethnic identity on the relationship between message format and message persuasive cues; instead, we will build linear regression models to test the association between ethnic identification and the narrative or didactic persuasive cues, respectively. The two-experiment study design, equal opportunities of randomization process, and the representativeness of the sample recruited from the research panel company reduced the uncertainty of this study to some extent. Statistically, we will show the confidence interval and standard errors to further report estimates of uncertainly. The detailed data analysis and the interpretation given to different outcomes can be found in Supplementary Table 1. All analyses will be completed using R (Version 4.1.0) (R Foundation for Statistical Computing, Vienna, Austria).

3. Summary

Despite the declined trend of per capita SSB intake among U.S. children and adults, SSB consumption remained high among Latino consumers [5,74], which calls for an urgent need to reduce Latino's SSB intake. Traditional individual-oriented health education approaches often result in small-scale personal health impacts, which is inadequate because they are not able to overcome the compelling corporate messaging that mislead vulnerable communities. This study proposes using intervention materials that incorporate culturally-

tailored elements and narrative message format as ways to counteract positive resonance created by the targeted marketing that uses the same strategies to manipulate consumers' food and beverage choices, aiming to develop public health education strategies to fundamentally address the health disparities. If successful, findings could identify Latino's health communication preferences and further inform material design for larger scale of public health interventions such as advocating or social marketing campaigns. Additionally, showing the effectiveness of counter marketing communication and education strategies to empower Latinos to consider the root causes of disease on a personal and collective level, this study could strengthen the role of policy-level actions such as SSB tax and warning labels to systematically address the health disparities across populations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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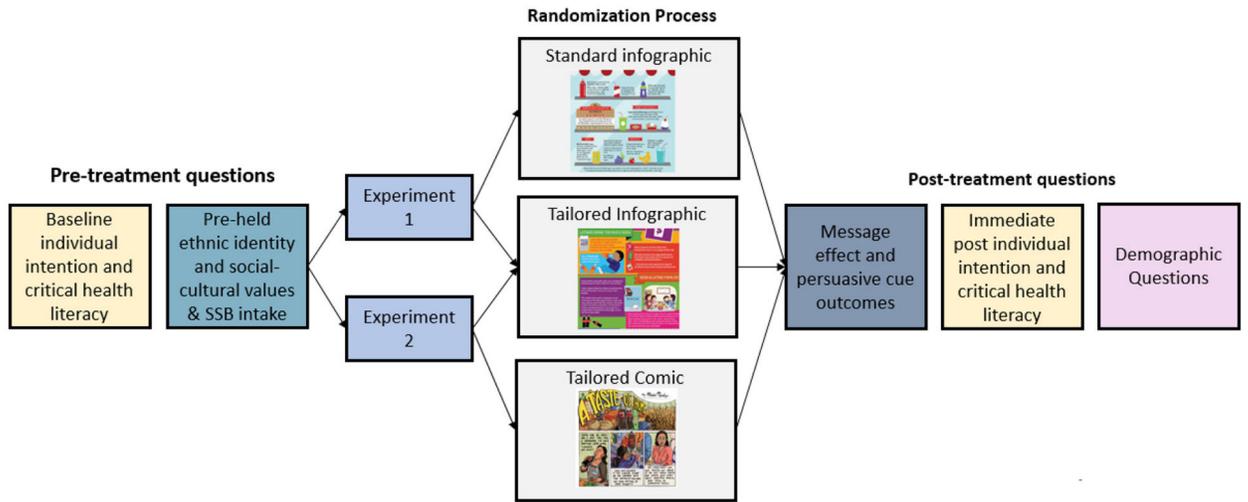


Fig. 1.
Study intervention process.

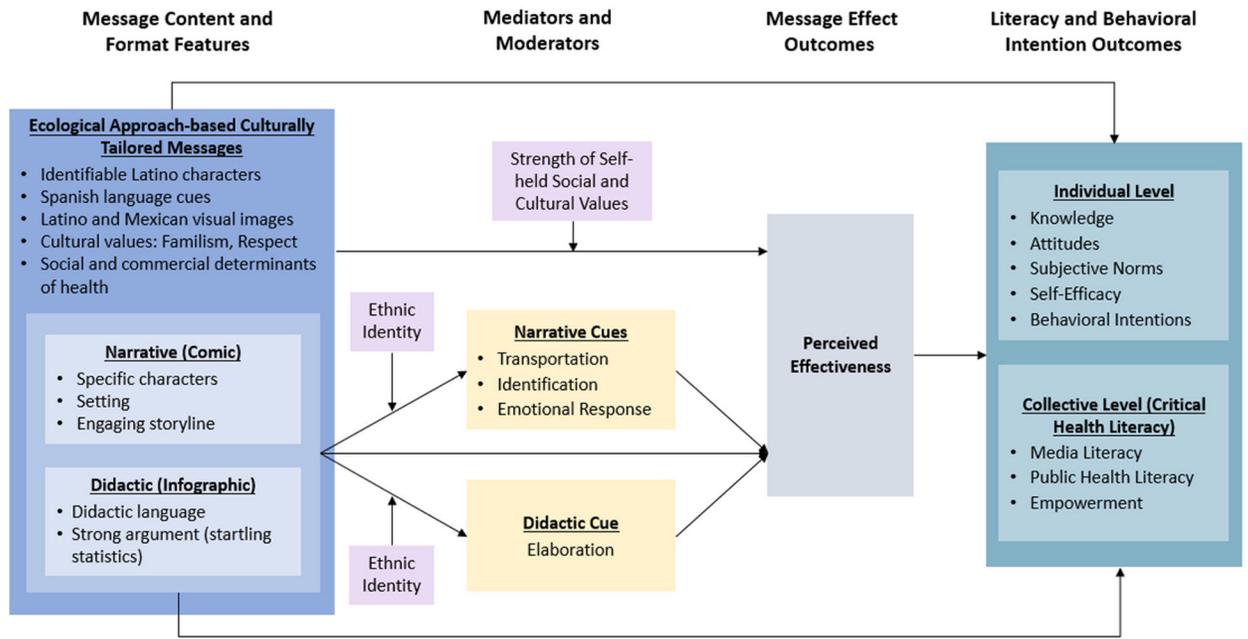


Fig. 2. Conceptual Framework to Test Message Features.

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Table 1

Outcome measures.

Outcome category	Scales	Subscales	Measures	One Example
Individual intention to reduce SSB (Guided by the Theory of Reasoned Action) [56]	Attitudes	n/a	5-point, 1-item Likert scale; Very Good = 5 to Very Bad = 1 adapted from Zoellner et al. [56] (Cronbach's Alpha = 0.79)	Reducing my consumption of sugary beverages over the next 3 months would be:
	Subjective norms	n/a	5-point, 1-item Likert scale; Strongly agree = 5 to Strongly disagree = 1 adapted from Zoellner et al. [56] (Cronbach's Alpha = 0.55)	Most people who are important to me would approve of my drinking less than 1 cup of sugary drinks each day for the next 3 months.
	Self-efficacy	n/a	5-point, 1-item Likert scale; Strongly agree = 5 to Strongly disagree = 1 adapted from Zoellner et al. [56] (Cronbach's Alpha = 0.51)	If I really wanted to, I am confident that I could reduce my consumption of sugary beverages over the next 3 months.
	Intention	n/a	5-point, 1-item Likert scale; Strongly agree = 5 to Strongly disagree = 1 adapted from Zoellner et al. [56] (Cronbach's Alpha = 0.93)	I plan to reduce my consumption of sugary beverages over the next 3 months.
Collective-level effects (Critical health literacy)	Media literacy	n/a	5-point, 8-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Chen et al. [57] (Cronbach's Alpha = 0.83)	Sugary drink ads link drinking these beverages to things people want, like love, good looks, and power.
	Public health literacy	n/a	5-point and 6-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from The Rapid Risk Factor Surveillance System [58] (Cronbach's Alpha = 0.78).	Having money is important for being healthy.
	Empowerment	Community control	4-point and 2-item Likert scale; Strongly Agree = 4 to Strongly Disagree = 1 adapted from Zimmerman et al. [59] (Cronbach's Alpha = 0.68).	I can influence decisions that affect my community.
		Perceived effectiveness of actions to influence community decisions	4-point and 3-item Likert scale; Very Effective = 4 to Not Effective = 1 adapted from Zimmerman et al. [59] (Cronbach's Alpha = 0.79).	How effective would it be to use social media to convince corporations to stop pushing sugar to vulnerable groups?
		Perceived difficulty	4-point and 2-item Likert scale; Strongly Agree = 4 to Strongly Disagree = 1 adapted from Zimmerman et al. [59] (Cronbach's Alpha = 0.78).	Community problems are often so complicated that even informed people can't figure out what should be done about them.
Message effect outcomes	Perceived effectiveness of the message	Message Acceptance	5-point and 2-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Dixon et al. [60] and other prior research [61] (Cronbach's Alpha = 0.89).	The message was easy to understand for me.
		Argument Strength	5-point and 4-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Dixon et al. [60] and other prior research [61] (Cronbach's Alpha = 0.88).	This message was effective.
		Personalized Perceived Effectiveness	5-point and 7-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Dixon et al. [60] and other prior research [61] (Cronbach's Alpha = 0.91).	The message was relevant to me.
Mediators	Transportation of messages (Will be	n/a	5-point and 2-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted based on scales by Green & Brock [62] and Kim [63] (Cronbach's Alpha = 0.85).	My attention was fully captured while viewing the message.

Outcome category	Scales	Subscales	Measures	One Example
	answered only by narrative group)			
	Identification with characters (Will be answered only by narrative group)	Identification with the character	5-point and 4-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from scales by Cohen [47] and Phua [64] (Cronbach's Alpha = 0.92).	During viewing, I felt I could really get inside the person's head.
		Perceived similarity with main characters	5-point and 2-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Cohen et al. [65] (Cronbach's Alpha = 0.93).	I feel the person in the message, and I have many things in common.
	Emotional response to messages (Will be answered by both narrative and didactic group)	Positive emotion	5-point and 7-item Likert scale; Not at all = 1 to Extremely = 5 adapted from Dixon et al. [60] (Cronbach's Alpha = 0.95)	Disgusted, Anxious, Ashamed, Fearful, Guilty, Sad and Angry.
		Negative emotion	5-point and 4-item Likert scale; Not at all = 1 to Extremely = 5 adapted from Dixon et al. [60] (Cronbach's Alpha = 0.95)	Proud, Validated, Hopeful and Empathetic.
	Elaboration of arguments (Will be answered by both narrative and didactic group)	General elaboration	5-point and 4-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Kahlor et al. [66] (Cronbach's Alpha = 0.77).	I found myself making connections between the video and what I've read or heard elsewhere.
		SSB specific elaboration	5-point and 3-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Dixon et al. [60] (Cronbach's Alpha = 0.92).	The message made me stop and think about how much sugar I consume.
Moderators	Acculturation	Proxy indicator of acculturation assessing generational status	7-item scale; combining respondents' country of birth with their parents' and grandparents' country of birth. US = 1, Mexican = 2 and Other = 3	Which country were you born?
		Attitudinal dimensions of acculturation	11-item scale from Unger et al. [67] assesses relative preference for Mexican versus American cultures; Four possible responses: US, The country my family is from, Both, and Neither. (1 = US and 0 = Every other response)	I am most comfortable being with people from...
		language-based short acculturation scale	5-item scale capture language preference in various situations; 5 = English only to 1 = Spanish only; Adapted from Marin and colleagues' [68] (Cronbach's Alpha = 0.90).	In general, what language do you speak?
	Familism	Support	5-point, 4-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Knight et al. [10] (Cronbach's Alpha = 0.58)	Family provides a sense of security because they will always be there for you.
		Obligation	5-point, 4-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Knight et al. [10] (Cronbach's Alpha = 0.55)	Older kids should take care of and be role models for their younger brothers and sisters.
	Respect	n/a	5-point, 4-item Likert scale; Strongly Agree = 5 to Strongly Disagree = 1 adapted from Knight et al. [10] (Cronbach's Alpha = 0.52).	No matter what, children should always treat adults with respect.
	Ethnic identity	Open-ended	One question adapted from Deshpande et al. [69] and Sellers et al. [70].	In terms of ethnic group, I consider myself to be: [Free response]
		Closed-ended	5-scale, 2-item Likert scale; Very Important = 5 to Not at all = 1 adapted from Deshpande et al. [69] and Sellers et al. [70].	How strongly do you identify as a [Free response from Q1]
Baseline SSB intake	n/a	n/a	BevQ-15 adapted from Hedrick et al. [71] that ask the intake for 15 categories of beverages including water, soft drinks, sweetened tea, etc.	In the past month, how often do you drink each beverage? How much do you drink each time?
Demographic questions	Age	n/a	Open ended question	What is your age?
	Gender	n/a	3-point, 1-item multiple choice: Female = 1; Male = 2; Other = 3	What is your gender?

Outcome category	Scales	Subscales	Measures	One Example
Ethnicity		n/a	9-point, 1-item multiple choice: Latina/o/x = 1; Hispanic = 2; Mexican = 3; Mexican-American = 4; Chicana/o/x = 5; White/Caucasian = 6; Black/African American = 7; Asian = 8; Other = 9	How would you describe your ethnicity?
Education level		n/a	7-point, 1-item multiple choice: Master's degree or above = 1; Bachelor's degree = 2; Highschool = 3; Some high school = 4; Elementary = 5; Never attended school = 6; I prefer not to say = 7	What is the highest degree or level of education you have completed?
Household income		n/a	10-point, 1-item multiple choice: \$0-19,999 = 1; \$20,000-29,999 = 2; \$30,000-39,999 = 3; \$40,000-49,999 = 4; \$50,000-59,999 = 5; \$60,000-69,999 = 6; \$70,000-79,999 = 7; \$80,000-99,999 = 8; More than \$100,000 = 9; I don't know = 10	Thinking about all sources of income, including your parents and any other working adults who live in the household where you grew up, how much income did your family make last year?
Food assistance		n/a	2-point, 1-item multiple choice: Yes = 1; No = 0	In the past year, have you received food assistance from any source, including CalFresh, WIC, TEFAP, or a local food pantry?
Food insecurity		n/a	2-point, 1-item multiple choice: Yes = 1; No = 0	In the past year, have you run out of food before the end of the month?