THE BRAVE STUDY: FORMATIVE RESEARCH TO DESIGN A MULTIMEDIA INTERVENTION FOR AMERICAN INDIAN AND ALASKA NATIVE YOUNG ADULTS

Stephanie Craig Rushing, PhD, MPH, Allyson Kelley, DrPH, MPH, Steven Hafner, PhD, David Stephens, RN, Michelle Singer, BS, Dyani Bingham, MPH(c), Colbie Caughlan, MPH, Bethany Fatupaito, MPH, Amanda Gaston, MAT, Thomas Ghost Dog, Paige Smith, CADC1, CPS, Danica Love Brown, PhD, MSW, and Celena McCray, MPH

Abstract: American Indian and Alaska Native (AI/AN) young adults are strong and resilient. Interventions designed to improve their mental health and help-seeking skills are especially needed, particularly those that include culturally relevant resources and relatable role models. This paper presents formative research from the BRAVE study, a five-year community based participatory research project led by the Northwest Portland Area Indian Health Board. Formative research included three phases and more than 38 AI/AN young adults and content experts from across the United States. Results indicate that behavioral interventions can be feasibly delivered via text message to AI/AN young adults and that including Native youth in the formative research is critical to designing a comprehensive, culturally-responsive intervention. Lessons learned from this five-year process may help other youth-serving organizations, prevention programs, policymakers, researchers, and educators as they support the next generation of AI/AN leaders.

INTRODUCTION

American Indians or Alaska Natives (AI/AN) under the age of 24 make up 37.6% of the AI/AN population (US Census, 2017). As a population, they have a multitude of strengths, including connection to culture, strong social support networks, extended families, and individual and community resilience (Anderson, et al., 2016). These strengths are challenged by high unemployment rates, lower educational attainment, high rates of trauma and loss, loss of culture and traditional values, and unhealthy behaviors (Center for Native American Youth, 2019). AI/AN young adults experience violence, substance misuse, aggression, and limited opportunities to

develop help-seeking skills; AI/AN young men experience these inequities at higher rates than females (Schonert-Reichl & Muller, 1996; National Center for Health Statistics, 2016).

A recent study published by the National Institute of Justice (Rosay, 2015) found that 82% of AI/AN men had experienced some type of violence in their lifetimes. Among AI/AN men, rates of violent victimization were 1.3 times higher than for non-Hispanic White men. Further, 73% of AI/AN men had ever experienced psychological aggression by an intimate partner, 43% of AI/AN men had ever experienced physical violence by an intimate partner, 27% of AI/AN men had ever experienced sexual violence, and 19% of AI/AN men had ever experienced stalking. In addition to high rates of victimization, AI/AN men also experience a disproportionate rate of incarceration. In 2015, 75% of all persons in jails in Indian Country were male (Minton, 2016). A high-risk segment of the population for violence involvement is young people (Division of Violence Prevention, 2020).

Substance misuse among AI/AN young adults also presents a major public health challenge. Data from the 2018 National Survey on Drug Use and Health show that one in five AI/AN young adults ages 18-25 has a substance use disorder (Substance Abuse and Mental Health Services Administration, 2019). Previous research indicates that they have a higher prevalence of substance use, earlier onset of use, more severe substance-related consequences, and lower perceived risk from harm related to substance use when compared with non-Native youth and young adults (Lawrence et al., 2014; Swaim & Stanley, 2018).

Developing healthy coping strategies and help-seeking skills in adolescence through young adulthood are critical for maintaining lifelong well-being. Previous research with Native American young adults indicates that they are more likely to seek help from informal sources than formal sources (Bee-Gates et al., 1996), and males are less likely to seek help than females (Schonert-Reichl & Muller, 1996). Factors known to promote help-seeking include emotional competence, positive attitudes, and social influences.

Unique behavioral interventions are needed to address these topics, while promoting cultural assets that can reach Native teens and young adults when and where they are ready. Mobile health (mHealth) interventions show promise. A meta-analysis by Badawy and Kuhns (2017) found that 42% of studies that utilized text messaging and mobile apps demonstrated significant improvements in preventive behaviors. Another study among college students found that text messaging was an effective platform for increasing awareness about health (Glowacki et al., 2018).

In sum, technology-based interventions are emerging as an effective strategy for promoting health and well-being among this age group.

AI/AN Media Use

The limited research on media and technology use among AI/AN teens and young adults suggests that social media and technology use is comparable to that of young people of other races and ethnicities (Markham et al., 2016). Focus groups conducted by the Center for Native American Youth (CNAY) with 230 AI/AN youth across the United States in 2015 indicated that youth desired technology-based mechanisms to improve health and wellness, including those delivered via smartphones and social media (CNAY, 2016). In 2016, the We R Native conducted a Youth Health Tech Survey that reached 675 AI/AN teens and young adults to learn more about their technology use and health information seeking practices and preferences. Results indicated that 88% of youth surveyed had regular access to a smartphone, and 63% had regular access to a desk or laptop computer. Over 92% reported accessing the internet from a phone on a daily or weekly basis, and 50% reported going online from a computer as often. Over 62% reported getting health information from the internet on a weekly or monthly basis, and 66% reported getting health information from social networking sites as often (NPAIHB, 2016).

In response to these trends, Rushing and Stephens (2012) developed recommendations for designing culturally appropriate, technology-based health interventions, with guidance to include medically accurate age- and gender- appropriate content, be holistic, be real ("reflect the unique life experiences of Native youth and address the root social determinants of their health"), be based in culture, focus on assets and skills, encourage dialogue with trusted adults, be interactive, and include evaluation plans to monitor use and assess impact. In sum, these findings suggest the potential feasibility of designing technology-based interventions to support health behavior change for AI/AN youth, with sufficient formative research.

This paper describes the development of a multimedia behavioral intervention; the process used to engage Native teens and young adults, content experts, and other stakeholders in the process; findings from the formative research; and lessons learned along the way.

Formative Research

To meet the unique needs of AI/AN young men, and in light of the lack of existing work in this domain, formative research was needed to ensure relevant, effective interventions are

developed. Formative research is used before an intervention is implemented and provides an opportunity to engage stakeholders in the research design process (Vastine et al., 2005), while examining the best ways to reach the target audience and target behavior change. Documenting the formative research processes and key findings with diverse populations like AI/ANs is important because most behavior change interventions are not designed with this population in mind. Results from formative research are rarely reported in the literature, yet results are valuable for informing programs, policies, and future health behavior change interventions (Gittelsohn et al., 2006).

Facilitating Organization and Partners

The Northwest Portland Area Indian Health Board (NPAIHB) is a tribal organization that represents 43 federally recognized tribes in Washington, Oregon, and Idaho (NW). The mission of the NPAIHB is to "eliminate health disparities and improve the quality of life of American Indians and Alaska Natives by supporting Northwest Tribes in their delivery of culturally appropriate, high-quality health care." The NPAIHB's governing board meets quarterly and is composed of one delegate from each member tribe, selected by the individual tribal governments. The Northwest Tribal Epidemiology Center (NW TEC) is housed under NPAIHB and provides support in the way of research, surveillance, and public health capacity building in partnership with the NW Tribes. This formative research was a collaboration between the NPAIHB's THRIVE and We R Native projects, the Department of Social & Behavioral Sciences at the Harvard T.H. Chan School of Public Health, Harvard University, and Sky Bear Media.

Guiding Principles

All of the NPAIHB's research and public health programs are guided by principles of community-based participatory research (CBPR). CBPR assumes that interventions can be strengthened by community insight and community theories and that participation in such efforts enhances the health and well-being of people (Wallerstein & Duran, 2006). As an orientation to research, CBPR was appropriate for this study because it focuses on AI/AN young adults as experts, acknowledges cultural influences, and identifies elements of substance misuse, violence, and aggression that are relevant to Native young adults and communities (Jumper-Reeves et al., 2014).

Principles of social marketing and narrative health communication also informed the design of the intervention. Social marketing is defined by Andreasen (1994) as "the application of

commercial marketing technologies to the analysis, planning, execution, and evaluation of programs designed to influence the voluntary behavior of target audience members in order to improve their personal welfare and that of society" (p. 110). Narrative health communication (i.e., role model videos) is an increasingly common form of behavioral intervention that stands in opposition to more factual approaches that attempt to change health behavior. Generally, it includes a story with a beginning, middle, and end, and with conflict, resolution, and identifiable characters (Hinyard & Kreuter, 2007). Hinyard and Kreuter (2007) posit that narrative communication reduces counter-arguing the messages and that user-engagement with the messages and identification with the characters increases their persuasiveness, improving narrative success. Another important component in narrative communication may be related to how believable participants find characters and situations to be. When characters are similar to participants in their characteristics or social views, participants may feel greater identification with characters that may lead to increased intervention effectiveness (Green & Brock, 2000).

Study Goals

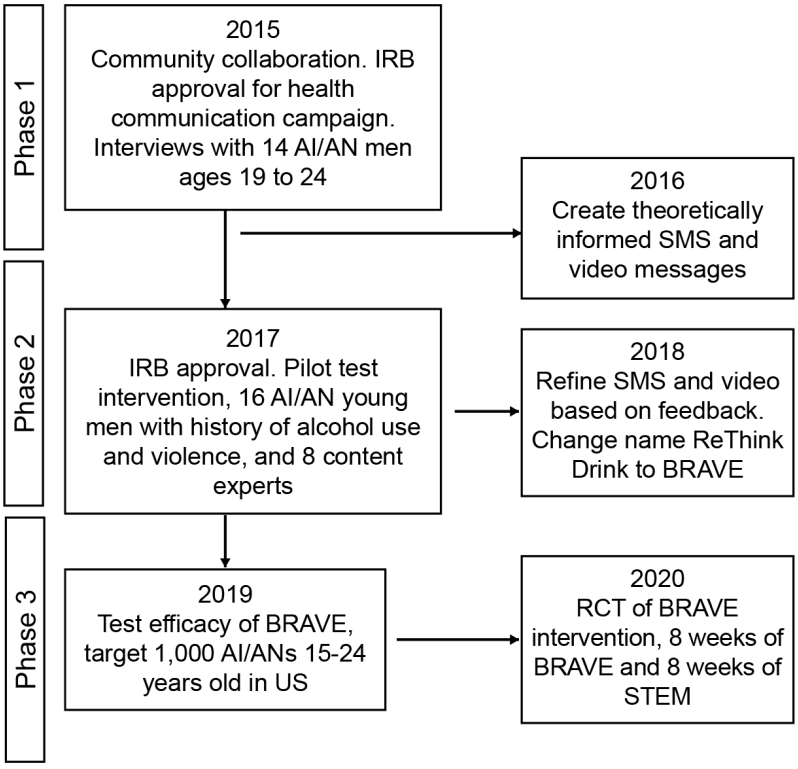
The BRAVE study is a multi-phase, national study to develop and evaluate a text message intervention featuring relatable role model videos. The goals of the formative research activities were to document Native teen and young adult views on safety and violence; design a text message sequence and video script to address violence, substance misuse, and promote help-seeking skills; pilot the intervention; and finalize the intervention text messages and role model videos for a nationwide randomized controlled trial (RCT). This study demonstrates the feasibility of our planed intervention delivery methods using role model videos and text messages and offers new information about how to develop and implement a behavioral intervention with AI/AN young adults.

METHODS

The study team utilized their experiences from a previous study, Texting 4 Sexual Health to guide the formative research process (Yao et al., 2018). Multiple behavior change theories guided the development process, including the health belief model, social cognitive theory, and the theory of planned behavior (Glanz et al., 2008).

All data collection methods were approved by the Portland Area Indian Health Service Institutional Review Board (PA IHS IRB) in Portland, OR (*PI:* Craig Rushing, *Protocol #:* 753252-5). Informed consent was obtained from parents or guardians for participants under 18 years of age. All instruments and data collection approaches were reviewed and revised by the NPAIHB team before data collection occurred. The consort flow diagram guided all phases of the BRAVE research and reporting process. Figure 1 outlines phases and participation throughout the research project. The present paper focuses on Phases 1-2 only.

Figure 1. Flow of Research from the BRAVE Study



Phase 1

The first phase of the study focused on better understanding alcohol misuse and the context of violence among Native males between the ages of 18-24 years. In July 2015, the project received Institutional Review Board (IRB) approval, and participants were recruited via We R Native's social media channels. We R Native is a multimedia health resource for Native youth, by Native youth, that uses web and social channels to reach over 1 million viewers per year. Our team designed an interview guide and conducted interviews with 14 AI/AN men 19-24 years of age, living in 13 states. Ten (10) participants lived in urban communities; four participants lived in rural

communities (Supplement A). The purpose of the interviews was to obtain information that could be used to design a messaging campaign addressing violence and alcohol misuse.

In July 2016, our team designed a series of theoretically informed, culturally relevant text messages (SMS) based on key informant interviews and evidence-based alcohol prevention and treatment interventions. The messages were designed to shift alcohol outcome expectancies, provide normative feedback based on reported behavior, teach non-violent anger management skills, and promote healthy social norms (i.e., offering alternatives to alcohol use, setting and maintaining personal limits, respecting peer's limits, etc.). In collaboration with Sky Bear Media, a Native-run filmmaking crew, we developed role model scripts to accompany the text messages.

Phase 2

In July 2017 we received IRB approval to pilot test the intervention with 16 AI/AN young men with a history of alcohol use and violence, and with 8 topical experts in alcohol prevention, alcohol treatment, violence prevention, health communication, and adolescent health. We put out a call for participants in NPAIHB's Healthy Native Youth eNewsletter. A study interest form was used to identify and select eligible young men who reported current alcohol use and who either witnessed or participated in violent acts. Both the young men and topical experts participated in the pilot test at the same time, and received the same information before, during, and after the study. The purpose of the pilot was to test the tone, content, and frequency of the planned text messages and video episodes (three staff read the role model script for the pilot test).

We collected pre- and post-surveys to document participant feedback on individual text messages, the 12 video episodes, intervention methods, and whether or not the text message series and videos would help achieve desired behavioral outcomes. The pre-survey included 12 questions that asked respondents about their age, work and school status, alcohol consumption, peer communications about alcohol consumption, and violent or aggressive behaviors and the frequency that alcohol was involved in these instances. Post-survey questions included 25 questions, the same pre-survey questions, and additional questions about alcohol consumption, alcohol expectancies, norms about alcohol, and confidence in ability to talk with a friend about alcohol consumption and aggressive or violent behaviors (see Supplement B and C). Participants were also asked for suggestions to improve the text message series or role model videos. During this phase, we changed the intervention name from "Rethink Your Drink" to "BRAVE" and improved the role model script

based on pilot test feedback. In 2019, Sky Bear Media filmed and edited the final BRAVE intervention videos.

Analysis

We used qualitative methods to analyze data collected in Phases 1-2. For Phase 1 data, we used TranscribeMe software to transcribe recorded interviews for analysis. Next, we created a codebook and domains from the original interview guide and used content analysis to allow themes to emerge from the data (Hsieh & Shannon, 2005). Domains included violence causes and effects, public safety, and violence prevention and messaging. We assessed inter-rater reliability for each domain using Dedoose's built-in testing abilities that reports Cohen's kappa. The Cohen's kappa for the domains analyzed were between 0.69 and 0.81, which according to Landis and Kock (1977) indicate substantial agreement. Our team used Dedoose version 7.5.9, a web-based mixed-methods analysis application, to analyze all qualitative data.

Analysis of Phase 2 data followed similar content analysis guidelines but included apriori themes from survey questions and analyzing responses based on feedback received and recommendations for improvement. We analyzed pre- and post-survey data from Phase 2 using similar content analysis methods from Phase 1 but used hand-coding techniques. Analysis followed a deductive process where codes and themes that emerged came from existing theories about health communication campaign messaging. Validity was achieved by using a coding scheme that guided the analysis process and assessing themes independently and as a group (Potter & Levine-Donnerstein, 1999). Overall, inter-rater reliability testing results indicated that there was general agreement between coders. We developed summary reports for each phase with subsequent themes that were reviewed by AI/AN young adults, NPAIHB team members, partners, and content experts. Revisions to the text messaging campaign and video scripts came from this iterative qualitative analysis process.

FINDINGS

Phase 1 – Interviews to design Health Communication Campaign 2015-2016

Key informant interviews with 14 AI/AN young adults ranged in length from 21 minutes to 67 minutes, with an average interview length of 42 minutes. Interviews included three sections:

violence effects and causes, public safety, and violence prevention messaging (see Supplement A). Themes from key informant interviews indicate that violence is widespread, but the effects of violence are not fully understood by respondents. For example, respondents discussed the role of alcohol and substance use in violence perpetration and as a coping mechanism following violence victimization, but these were not always linked to broader impacts to the community. The most prevalent type of violence included bullying and domestic violence. Drugs and alcohol, and other anti-social behaviors, were identified as contributors to violent behaviors and a detriment to public safety. Based on this feedback, we expanded the scope of our messages beyond violence and identified drug and alcohol users as an important target audience for the intervention.

The focus of our formative research at this point was to decrease violence, aggression, and alcohol consumption among Native young adult males ages 18-24 across the United States. Using themes from the key informant interviews, we developed a theoretically informed text message campaign. To create a complementary role model video that could reinforce the skills described in the text messages, we shared the interview themes with Sky Bear Media, who wrote the first draft. The script shared the story of Alex, Christina, and Benny, depicting three relatable character-types (perpetrator, survivor, and bystander), including their personal histories with alcohol and violence, their relationships to one another, and a turning-point for each character that demonstrated behavior change skills and cultural resources. The scenes and dialogue were collaboratively edited and refined by the team over 12 months.

Phase 2 – Piloting Intervention 2017-2018

The pilot test involved 16 AI/AN young men 18-24 years old with a history of alcohol use and violence, and 8 topical experts in alcohol prevention, alcohol treatment, violence prevention, health communication, and AI/AN adolescent health promotion. Altogether, 23 AI/AN young men and topical experts provided feedback on components of the SMS intervention; 14 young men participated in the pre-survey, and 12 participated in the post-survey. On average, participants who gave feedback felt individual text messages were useful or relevant 82% of the time.

Overall, participants thought the intervention was relatable and helpful. One AI/AN young man wrote, “During this time I have been going through very stressful times, I have started drinking a lot and the messages I received kept me grounded during these times. I was a big fan of the videos.” Another participant wrote, “They did a really good job of making you realize you are

responsible for our own actions and how we can better to control them." Recommendations for improvement from AI/AN young men were limited, "I think everything was relevant and helpful… but maybe try giving me a quiz on things I've learned."

Topical experts suggested the first few video episodes could be used to emphasize the family histories that influenced the characters, then shift to vignettes that would encourage the audience to reassess their behaviors and reach out to trusted adults (like counselors and helplines). Experts loved that the intervention had youth sharing their own experiences and recommended that the intervention promote honesty while encouraging youth to reach out to others. One expert said, "My two suggestions are to provide more positive vignettes and to encourage youth to reach out to trusted mentors and role models." Another expert felt more information was needed about the purpose of BRAVE:

> Give a little background into who you are and what you're hoping to accomplish with this series. Also let us know to expect a series of videos from Alex and friends, [that they're] the same group of friends. Also provide some sobriety resources at the end, and say, "You don't have to drink again if you don't want to. Remember when you are ready to stop drinking there are people who will support and help you."

Other changes to the intervention's target audience, content, and age groups were related to shifting funding sources over the course of the project. One agency felt the audience needed to be broadened to include females; they did not ultimately fund the study. A second agency funded the next phase of the project, but required that there be greater focus on demonstrating help-seeking skills and the inclusion of participants 15-18 years old. Inclusion and exclusion criteria were thus modified for Phase 3, when the intervention was evaluated for efficacy. The messages and script were subsequently reviewed by the team to increase focus on trauma and resilience, intimate partner violence, bystander skills, alcohol and drug resources, help-seeking from trusted adults, suicide warning signs, and the power of culture to provide a sense of identity and purpose.

Table 1 outlines changes that that were made to improve the text messages and video script based on key informant interviews, pre- and post-surveys, and content expert recommendations. Exemplars provide statements from data that describe the recommended change. Categories outline formative research guidelines in the areas of feasibility and acceptability with a strong emphasis on content.

Table 1
Changes to Improve Text Messaging and Video Scripts

Phase and Focus	Recommended Changes	Exemplar	Category
Phase 1- Exploring Health Communications Campaign and Violence	Expand to all AI/AN young adults 18-24, men and women	"A broad campaign that is relevant to several different groups would be best for a prevention messaging campaign." - Research Partner	Recruitment
	Include alcohol and drug-related violence	"This project indicates that alcohol- and drug-related violence is an issue that warrants particular attention." - Research Partner	Content
	Use multimedia format	"Multimedia was the only identified format for any campaign." - Research Partner	Delivery
Phase 2- Pilot test intervention videos	Changed the intervention name from Rethink Your Drink to BRAVE	"ReThink Your Drink was already being used by a water promotion campaign." - Principal Investigator	Acceptability
	Define intended audience, intervention goals, expand to help-seeking skills	"…behavioral skills I would suggest is promoting the trait of honesty in their lives- being able to look at their behaviors and honestly share them with someone else." - Content Expert	Delivery and content
	Create stand-alone pre-video trailer, reduce number of episodes, offer two delivery options	"I think we need to cut down the length of the videos. They ended up longer than we originally anticipated." - Content Expert	Content
	Revise storyline, introduce videos	"Be more specific in the messages you try to get across. Keep developing videos." - AI/AN Young Adult Male	Content
	More positive tone, emphasize honesty, responsibility, traditional values	"…describes positive outcomes from living a healthy life." - AI/AN Young Adult Male	Content
	Broaden target age group, include females	"So we moved forward… with 15-18 age group and females…" - Principal Investigator	Audience
Phase 2 Pilot test intervention text messages	Provide mental health and sobriety resources	"…provide some sobriety resources at the end. And say you don't have to drink again if you don't want to." - Content Expert	Content
	Include quiz to test knowledge gained	"…everything was relevant and helpful. But maybe try giving me a quiz on things I've learned." - AI/AN Young Adult Male	Content
	Include message about not drinking before a ceremony	"… drinking before or after ceremony, on the drum or at powwow, things like that are really bad… it directly contradicts teachings of wearing ceremonial items or with the respect of honoring certain objects or moments." -Content Expert	Content
Phase 3 BRAVE		Intervention is active, pending results	

Phase 3 – Randomized Controlled Study 2019-2020

With the formative research and video series complete, the team began the RCT to test the efficacy of the intervention with 1,000 AI/AN teens and young adults aged 15-24 years old nationwide in September 2019, expanding the original inclusion criteria to include females and teens 15-17 years old. Youth who enrolled in the study were randomized to receive either 8 weeks of BRAVE text messages, designed to improve mental health, help-seeking skills, and promote cultural pride and resilience, or 8 weeks of Science Technology Engineering and Math (STEM) text messages, designed to elevate and re-affirm Native voices in science, technology, engineering, math, and medicine. Afterward, the two groups switched, and participants received the other set of messages. Eligible teens and young adults received three to six text messages per week in the evenings and received $40.00 for completing four surveys over 9 months. Results from the BRAVE study will be published when complete.

Lessons Learned from BRAVE Formative Research

- AI/AN teens and young adults are a unique population who experience multiple health inequities. Formative research to design behavioral health interventions in this population has the potential to improve health equity.
- Formative research requires commitments that withstand the test of time – changes to the target audience, health focus, team members, and funding agency occurred over the five-year study.
- Formative research must be funded, but there are limited resources available in AI/AN communities to support this iterative process. BRAVE pulled funding from multiple sources; this required changing the intervention's focus, target population, and intervention strategy over time. Greater flexibility from funding agencies is needed to support formative research and the design of behavioral interventions tailored to the unique needs and experiences of specific populations.
- NPAIHB worked with a Native-owned film crew, Sky Bear Media, to develop, test, and revise the script. This working relationship was essential to the formative research process. Sky Bear Media's willingness to work iteratively, weaving in feedback from youth and topical experts, improved the final video immensely.

- NPAIHB's strong collaborations with THRIVE, We R Native, and the Department of Social & Behavioral Sciences at the T.H. Chan School of Public Health at Harvard University were critical to develop and test the BRAVE intervention. The collaboration was ultimately successful because of a shared mission and values to design an evidence-based intervention that would help Native youth.
- We recognize that experts exist in all places. Formative research requires teams to seek out this expertise and create a collective knowledge base that honors the unique knowledge, skills, and histories of the target population. In this study, it was AI/AN teens and young adults and tribal communities.
- The equitable involvement of communities and stakeholders in the formative research process may increase the likelihood that an intervention will be successful. BRAVE formative research viewed feedback from AI/AN teens and young adults as equal to feedback from content experts.

DISCUSSION

This paper summarizes the process used to develop a theoretically informed, culturally relevant text message intervention with role model videos for AI/AN young adults in the United States. NPAIHB's partnerships and extensive AI/AN social media presence contributed to the overall success of the formative research. Through the key informant interviews in Phase 1, we were able to assess the cause and consequences of violence among young adult AI/AN males. The findings indicated that alcohol was often a contributing factor, so alcohol misuse was portrayed in the role model video script.

In 2015, when the ReThink Your Drink Study began, we did not know how best to address violence in AI/AN young men. Themes from key informant interviews conducted in Phase 1 recommended and expanded the intervention's focus. In Phase 2 of the project, we pilot tested the video scripts and text message series to determine if they were relatable to the audience and could effectively reduce self-reported alcohol use and alcohol-related violent incidents. Reviewers—including AI/AN young adults, content experts, and funding agencies—felt the intervention could be effective, but could be improved by opening the intervention up to female and teen participants, amplifying and reinforcing healthy social norms and cultural values, incorporating suicide warning signs, better-preparing youth to initiate difficult conversations with peers and trusted adults, and

encouraging youth to access health resources (i.e., tribal clinics, chat lines, intimate partner violence counseling).

With Phase 3 of the BRAVE study now underway, we believe the formative research outlined in this manuscript contributed to a better intervention. With few evidence-based interventions designed with AI/AN teens and young adults in mind, this is one of the first interventions of its kind using culturally relevant images, narrative role model videos, and text messages that address alcohol misuse, intimate partner violence, and help-seeking skills, while promoting cultural pride.

Strengths and Limitations

The BRAVE formative research had several strengths and limitations. The length of the project, the commitment and leadership of NPAIHB, the diversity of AI/AN young adults involved, and the assistance from content experts provided consistent support for the BRAVE study. BRAVE's focus on culturally relevant images, language, and the use of peers as role models demonstrated respect for diversity, values, and translation of health communication messaging that AI/AN youth could identify with.

Limitations of the BRAVE formative research mainly relate to the changes in the target audience and approach. Grant funders and community stakeholders recommended that we expand the target audience to include females and younger teens than originally interviewed (and pilot tested). These changes were not pilot tested but integrated into the BRAVE RCT; the team is waiting to see whether the intervention is as effective for female participants and younger teens, as it is for those who met the original inclusion criteria.

We used convenience sampling methods; therefore, the interview and pilot test findings are not representative of the entire population of AI/AN young adults. The sample was recruited largely through We R Native, a multimedia health and wellness resource, which may have influenced how they viewed the BRAVE study and their participation in it. Participants represented 10 communities, and they did not represent the geographic and tribal diversity of all AI/AN young adults in the United States. Qualitative analysis in Phase 1 relied on Dedoose software, which limits how codes are applied to interviews. Additionally, structured interview guides limited the comprehensiveness of responses and additional thoughts that participants may have had if the interviews were less structured and informal.

Next Steps

Phase 3 of the BRAVE intervention is now underway, and staff at the NPAIHB are enthusiastic about the results of this nation-wide study involving nearly 1,000 AI/AN urban and reservation youth. If the BRAVE intervention demonstrates improvements in mental health, help-seeking skills, and cultural pride and resilience, it will be the first evidence-based health intervention of its kind for AI/AN teens and young adults.

CONCLUSION

Native teens and young adults are indeed brave. They come from a long line of ancestors who fought for freedom, defended their culture and homelands, and relied upon kinship systems and community support to live a healthy life. Formative research from BRAVE builds on this history and connects AI/AN teens and young adults to people, stories, resources, and teachings that demonstrate what it means to be strong and resilient.

REFERENCES

Anderson, K.M., & Olson, S. (2016). Contributors to Resilience. In National Academies of Sciences, Engineering, and Medicine (Ed.), *Advancing Health Equity for Native American Youth: Workshop Summary*. Washington, DC: The National Academies Press. https://doi.org/10.17226/21766

Andreasan, A. R. (1994). Social marketing: Its definition and domain. *Journal of Public Policy & Marketing, 13*(1), 108-114. https://doi.org/10.1177/074391569401300109

Badawy, S. M., & Kuhns, L. M. (2017). Texting and mobile phone app interventions for improving adherence to preventive behavior in adolescents: A systematic review. *JMIR mHealth and uHealth*, *5*(4), e50. https://doi.org/10.2196/mhealth.6837

Bee-Gates, D., Howard-Pitney, B., LaFromboise, T., & Rowe, W. (1996). Help-seeking behavior of Native American Indian high school students. *Professional Psychology: Research and Practice, 27*(5), 495. https://doi.org/10.1037/0735-7028.27.5.495

Center for Native American Youth (CNAY). (2016). *Health innovation & equity: Recommendations from Native American youth*. Washington, DC: Center for Native American Youth, The Aspen Institute.

Center for Native American Youth (CNAY). (2019). *State of Native Youth Report, Native Youth Count.* Washington, DC: Center for Native American Youth, The Aspen Institute. https://www.cnay.org/wp-content/uploads/2019/11/2019-State-of-Native-Youth-Report_PDF.pdf

Division of Violence Prevention. (2020). *Understanding youth violence*. Atlanta, GA: Division of Violence Prevention, National Center for Injury Control, Centers for Disease Control and Prevention, US Department of Health and Human Services. https://www.cdc.gov/violenceprevention/pdf/yv/YV-factsheet_2020.pdf

Gittelsohn, J., Steckler, A., Johnson, C. C., Pratt, C., Grieser, M., Pickrel, J., Stone, E. J., Conway, T., Coombs, D., & Staten, L. K. (2006). Formative research in school and community-based health programs and studies: "State of the art" and the TAAG approach. *Health Education & Behavior*, *33*(1), 25-39. http://dx.doi.org/10.1177/1090198105282412

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). *Health behavior and health education: theory, research, and practice.* San Francisco, CA: John Wiley & Sons.

Glowacki, E. M., Kirtz, S., Hughes Wagner, J., Cance, J. D., Barrera, D., & Bernhardt, J. M. (2018). HealthyhornsTXT: A text-messaging program to promote college student health and wellness. *Health Promotion Practice*, *19*(6), 844–855. https://doi.org/10.1177/1524839917754089

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*(5), 701-721. https://doi.org/10.1037/0022-3514.79.5.701

Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: A conceptual, theoretical, and empirical overview. *Health Education & Behavior*, *34*(5), 777-792. http://dx.doi.org/10.1177/1090198106291963

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277-1288. http://dx.doi.org/10.1177/1049732305276687

Jumper-Reeves, L., Dustman, P. A., Harthun, M. L., Kulis, S., & Brown, E. F. (2014). American Indian cultures: How CBPR illuminated intertribal cultural elements fundamental to an adaptation effort. *Prevention Science*, *15*(4), 547-556. http://dx.doi.org/10.1007/s11121-012-0361-7

Landis, R. J., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159-174. https://doi.org/10.2307/2529310

Lawrence, E. M., Pampel, F. C., & Mollborn, S. (2014). Life course transitions and racial and ethnic differences in smoking prevalence. *Advances in Life Course Research*, *22*, 27-40. http://dx.doi.org/10.1016/j.alcr.2014.03.002

Markham, C. M., Rushing, S. C., Jessen, C., Gorman, G., Torres, J., Lambert, W. E., Prokhorov, A. V., Miller, L., Allums-Featherston, K., Addy, R. C., Peskin, M. F., & Shegog, R. (2016). Internet-based delivery of evidence-based health promotion programs among American Indian and Alaska native youth: A case study. *JMIR Research Protocols*, *5*(4), e225. http://dx.doi.org/10.2196/resprot.6017

Minton, T. D. (2016). *Jails in Indian Country, 2015.* Washington, DC: Bureau of Justice Statistics, Office of Justice Programs, US Department of Justice.

National Center for Health Statistics. (2016). *Compressed Mortality File 1999-2015 on CDC WONDER Online Database*. Atlanta, GA: National Center for Health Statistics, Centers for Disease Control and Prevention, US Department of Health and Human Services. https://wonder.cdc.gov/controller/datarequest/D132;jsessionid=CB6D30304A7A062BF98C5C2202BF535B

Northwest Portland Area Indian Health Board. (2016). We R Social: Findings from the 2016 Youth-Health-Tech Survey. http://www.npaihb.org/wp-content/uploads/2016/02/We-R-Social-Youth-Health-Tech-Survey-20161.pdf

Potter, W. J., & Levine-Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. *Journal of Applied Communication Research*, 27(3), 258-284. http://dx.doi.org/10.1080/00909889909365539

Rosay, A. B. (2015). *Violence Against American Indian and Alaska Native Women and Men: 2010 Findings from the National Intimate Partner and Sexual Violence Survey.* Washington, DC: National Institute of Justice, Office of Justice Programs, US Department of Justice.

Rushing, S. C., & Stephens, D. (2012). Tribal recommendations for designing culturally appropriate technology-based sexual health interventions targeting Native youth in the Pacific Northwest. *American Indian and Alaska Native Mental Health Research 19*(1), 76-101. http://dx.doi.org/10.5820/aian.1901.2012.76

Schonert-Reichl, K. A., & Muller, J. R. (1996). Correlates of help-seeking in adolescence. *Journal of Youth and Adolescence*, *25*(6), 705-731. https://doi.org/10.1007/BF01537450

Substance Abuse and Mental Health Services Administration. (2019). *2018 National Survey on Drug Use and Health Detailed Tables*. https://www.samhsa.gov/data/report/2018-nsduh-detailed-tables

Swaim, R. C., & Stanley, L. R. (2018). Substance use among American Indian youths on reservations compared with a national sample of US adolescents. *JAMA Network Open*, *1*(1), e180382-e180382. http://doi.org/10.1001/jamanetworkopen.2018.0382

US Census Bureau. (2017). *S0201 Selected population profile in the United States: 2017 American Community Survey 1-Year estimates*. Washington, DC: US Census Bureau, US Department of Commerce. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_1YR_S0201&prodType=table

Vastine, A., Gittelsohn, J., Ethelbah, B., Anliker, J., & Caballero, B. (2005). Formative research and stakeholder participation in intervention development. *American Journal of Health Behavior*, 29(1), 57-69. https://doi.org/10.5993/ajhb.29.1.5

Wallerstein, N. B., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health Promotion Practice*, *7*(3), 312-323. http://dx.doi.org/10.1177/1524839906289376

Yao, P., Fu, R., Craig Rushing, S., Stephens, D., Ash, J. S., & Eden, K. B. (2018). Texting 4 Sexual Health: Improving attitudes, intention, and behavior among American Indian and Alaska Native youth. *Health Promotion Practice, 19*(6), 833-843. https://doi.org/10.1177/1524839918761872

ACKNOWLEDGEMENTS

We appreciate the support of NPAIHB and the commitment of teens and young adults throughout Indian Country. Thank you for helping us understand more about formative research and the BRAVE intervention.

FUNDING INFORMATION

The BRAVE intervention was developed, in part, with staff funded by grant number H79SM082106 from SAMHSA. The views, opinions and content of this publication are those of the authors and contributors, and do not necessarily reflect the views, opinions, or policies of CMHS, SAMHSA, or HHS, and should not be construed as such.

The final phase of the study was funded by a grant from the Technology and Adolescent Mental Wellness (TAM) program at the University of Wisconsin-Madison. The content is solely the responsibility of the authors and does not necessarily represent the official views of the university or the TAM program.

AUTHOR INFORMATION

Dr. Stephanie Craig Rushing is a Principal Investigator at the Northwest Portland Area Indian Health Board in Portland, OR. Dr. Allyson Kelley is a Senior Community Health Scientist and President at Allyson Kelley & Associates in Sisters, OR. Dr. Steven Hafner (Oglala Sioux) is a Research Scientist for the National Missing and Unidentified Persons System in Washington, DC. David Stephens is a Project Director at the Northwest Portland Area Indian Health Board in Portland, OR. Michelle Singer (Navajo) is Project Manager at the Northwest Portland Area Indian Health Board in Portland, OR. Dyani Bingham (Assiniboine/Blackfeet/Metis) is a Senior Evaluation Associate at Allyson Kelley & Associates in Sisters, OR. Colbie Caughlan is a Project Director at the Northwest

Portland Area Indian Health Board in Portland, OR. Bethany Fatupaito is a Senior Evaluation Associate at Allyson Kelley & Associates in Sisters, OR. Amanda Gaston (Zuni) is a Consultant for the Northwest Portland Area Indian Health Board in Portland, OR. Thomas Ghost Dog (Burns) is a Project Coordinator at the Northwest Portland Area Indian Health Board in Portland, OR. Paige Smith (Modoc, Paiute, Shoshone) is a Project Coordinator at the Northwest Portland Area Indian Health Board in Portland, OR. Dr. Danica Love Brown (Choctaw Nation of Oklahoma) is a Project Director at the Northwest Portland Area Indian Health Board in Portland, OR. Celena McCray (Navajo) is a Project Manager at the Northwest Portland Area Indian Health Board in Portland, OR.

APPENDIX

Appendix A: Phase 1 BRAVE Interview Guide

BRAVE- Interviewer Guide

A sub-set of these questions will be used for each interview/mini focus-group.

Final revisions to this guide will be made in late June/early July in consultation with the PI, Co-PI, and other members of the Northwest Portland Area Indian Health Board.

Script:

Hello! My name is_____ and I am from the Northwest Portland Area Indian Health Board. Thank you for participating in this interview. I am part of a group that is looking at how young adults view violence and safety in their communities. Because you are in this age group, I want to better understand your ideas and thoughts around violence and public safety in your community.

Before we begin, let's go over a few things that will help our conversation:

This discussion will be pretty informal. I will be tape recording and taking notes, so please try to speak up. If there's anything that is unclear, please stop me. If there's anything you feel uncomfortable talking about, you can just say 'pass.'

From time to time, I may interrupt the conversation or change the subject so that we have enough time to cover all our questions. If you feel strongly about a certain subject and we have time at the end, we can continue talking about it, or you can talk to us after the group is over. Any questions so far?

***[Interviews]** Also, everything that is said in this interview will remain completely confidential. If you have any concerns about privacy related to this interview, please let me know at any time. Feel free to ask any questions you want at any time.*

***[Focus groups]** Last thing before we begin, we will be using what's called a "closed talking circle." This means that whatever is said in the group, stays in the group, period. We are doing this to respect each other's thoughts and opinions by not sharing each other's names or any comments people make. These things will not leave this room when we are finished. If you have any concerns about this please come talk to either of us after our session is over.*

Finally, I will be tape recording the discussion, only because I don't want to miss any of your comments. However, I want you to feel confident knowing that no one outside the research team will have access to these tapes. They will be destroyed after we write the reports we need to. If you don't want to be recorded, you can still participate. Do you agree to be recorded?

□Yes □No

Do you have any questions before we begin?

Warm up Questions:

1. Can you tell me about the community in which you live?
    a. PROBE: Is it an urban community or tribal community?
    b. PROBE: Is it mostly Native or non-Native? Are the Natives in your community all from the same tribe or do they come from different tribes?
    c. PROBE: Is your sense of community defined by the people living in the same area as you; as sharing the same attitudes, beliefs, or interests as you; or on some other characteristic?

Violence Prevalence and its Effects

2. Do you feel that violence is an issue in your community as defined above?
3. Which of these types of violence is most prevalent in your community?
    a. PROBE: Why do you think this type of violence is most prevalent in your community? Types of violence include bullying, domestic violence (i.e., within homes), intimate partner violence (e.g., between partners), sexual assault (including rape, reproductive control, etc.), stalking, physical assault, and gun violence.
4. What effect do you think this violence has on your community?
5. What type of people do you believe commit the most violence in your community?
    a. PROBE: Why do you think these types of people are committing violence?
6. To what extent do you believe that violence in your community is related to other issues in your community?
    a. PROBE: What other health behaviors, such as alcohol use, do you think contribute to violence in your community?
    b. PROBE: What other social factors, such as unemployment, do you think contribute to violence in your community?

We are particularly interested in knowing more about "public safety" as it relates to violence.

7. Do you feel safe in your community?
    a. PROBE: What makes your community feel safe or unsafe?
8. To what extent does the physical environment contribute to feelings of safety in your community?
    a. PROBE: What about the physical environment makes your community feel safe or unsafe (e.g., no street lights, cracked sidewalks, trash)?
9. To what extent does the social environment contribute to feelings of safety in your community?
    a. PROBE: What about the social environment makes your community feel safe or unsafe (e.g., gangs, low police presence, drug trade, many bars)
10. What are your attitudes towards law enforcement in your community?
    a. PROBE: What makes it effective at preventing violence in your community?
    b. PROBE: What makes it ineffective at preventing violence in your community?

11. Do you think most people in your community trust the law enforcement in your community?
    a. PROBE: What factors influence a person's trust in their law enforcement?
12. Do you think law enforcement in your community treats Natives the same way as non-Natives?
    a. PROBE: If no, how are they treated differently?
    b. PROBE: What effect does this different treatment have on your views towards law enforcement?
13. Do you think law enforcement is concerned with violence in your community?
    a. PROBE: What issues do you think law enforcement is most concerned with in your community (e.g., drugs)?
14. What types of things could law enforcement do to be more effective at preventing violence in your community?
15. Are there any other government agencies or community organizations that contribute to feelings of public safety in your community, either positively or negatively?
    a. PROBE: How do these organizations contribute in such ways?

Violence Prevention

16. Who do you think is most responsible for preventing violence in your community?
17. What types of resources do you think would be helpful for young adults who are committing violent act?
18. What types of things could someone your age do if they know someone who is committing violent acts?
    a. PROBE: What should someone your age do in that situation?
    b. PROBE: What types of things could any young adult do if they were aware of violence in their community?
19. If you saw something that concerned you, what would cause you to take action?
20. Are there any other people who might be aware of the situation who could take action to help?
21. What are some things that could stop someone from taking action?
    a. PROBE: If you saw something that concerned you, what would stop you from doing something about it?
    b. PROBE: Are there any other things that stop young adults from intervening?

Messaging

22. What types of messages do you think would help in preventing violence in your community?
23. To whom do you think such messages should be targeted (e.g., perpetrators, policymakers, other community members)?
    a. PROBE: How do you think the messages should differ between these groups?
24. What do you think would be the most effective ways to get messages to these members of your community?
    a. PROBE: Social media? If so, which ones?

What tone do you think such messages should take?

Appendix B: Phase 2 Pilot SMS

BRAVE Visual Plot of Pilot SMS Message and Other Questions

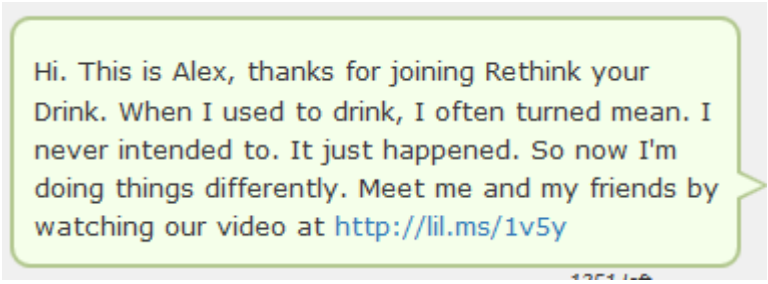
This is an example of the BRAVE pilot SMS messages and follow up SMS messages that were sent after they received the text messages and role model videos. After each video, participants were asked two questions:

1) Did the last text seem useful or relevant? *Yes* or *No*
2) Is there anything you'd change or suggest that we do differently? Open text response

The study team also monitored click-thru numbers to monitor participant engagement with the content.

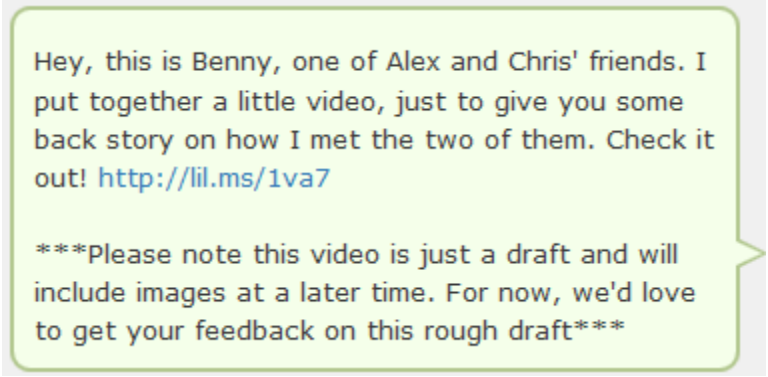
These are the actual text messages that participants received.

1. **Feedback on Video – Episode #1:**



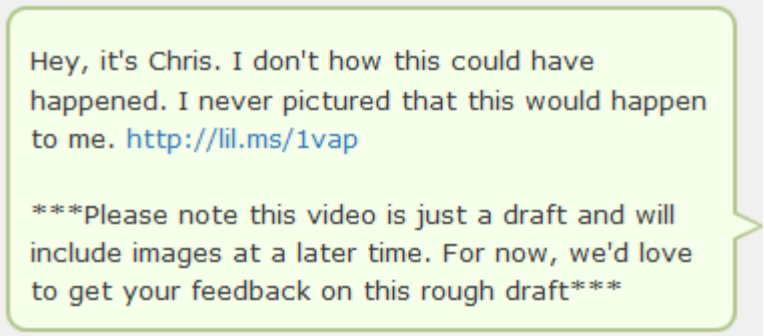
2. **Feedback on Video – Episode #2:**

3. **Feedback on Video – Episode #3:**

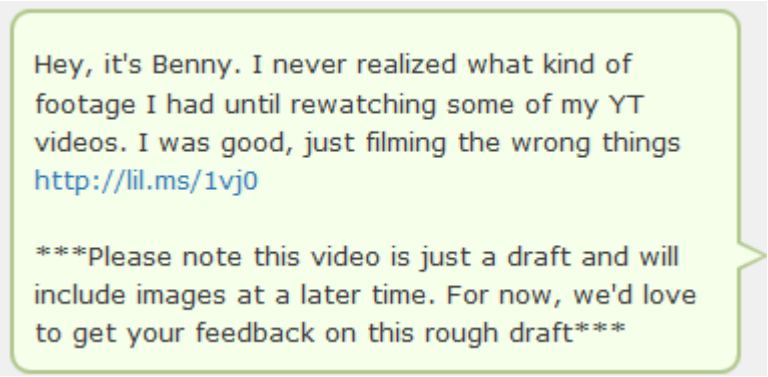


4. **Feedback on Video – Episode #4:**

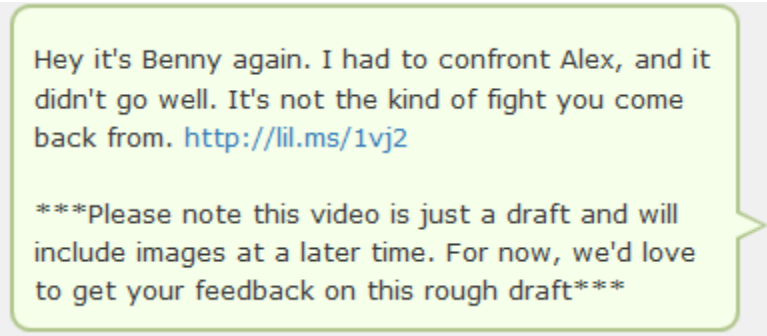
5. **Feedback on Video – Episode #5:**



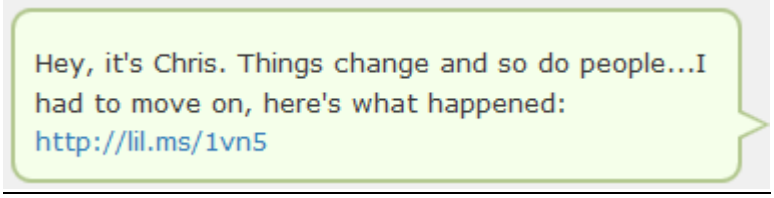
6. **Feedback on Video – Episode #6:**



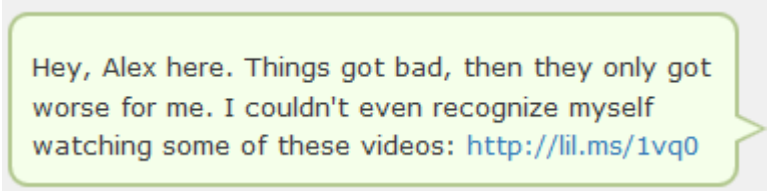
7. **Feedback on Video – Episode #7:**



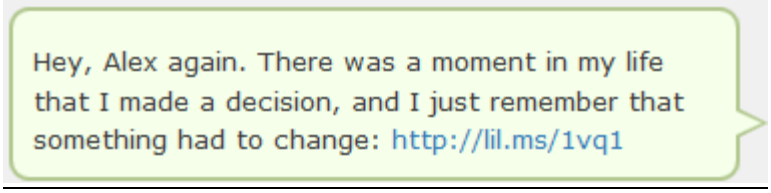
8. **Feedback on Video – Episode #8:**



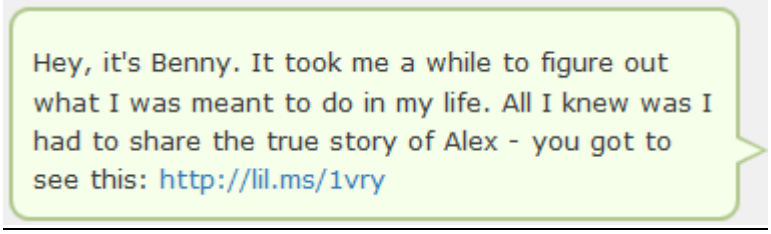
9. **Feedback on Video – Episode #9:**



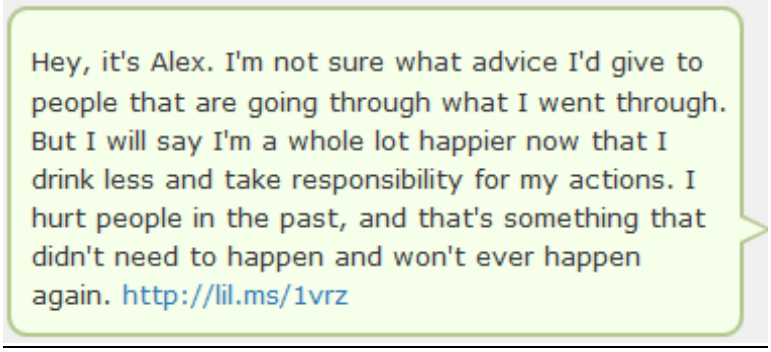
10. **Feedback on Video – Episode #10:**



11. **Feedback on Video – Episode #11:**



12. **Feedback on Video – Episode #12:**

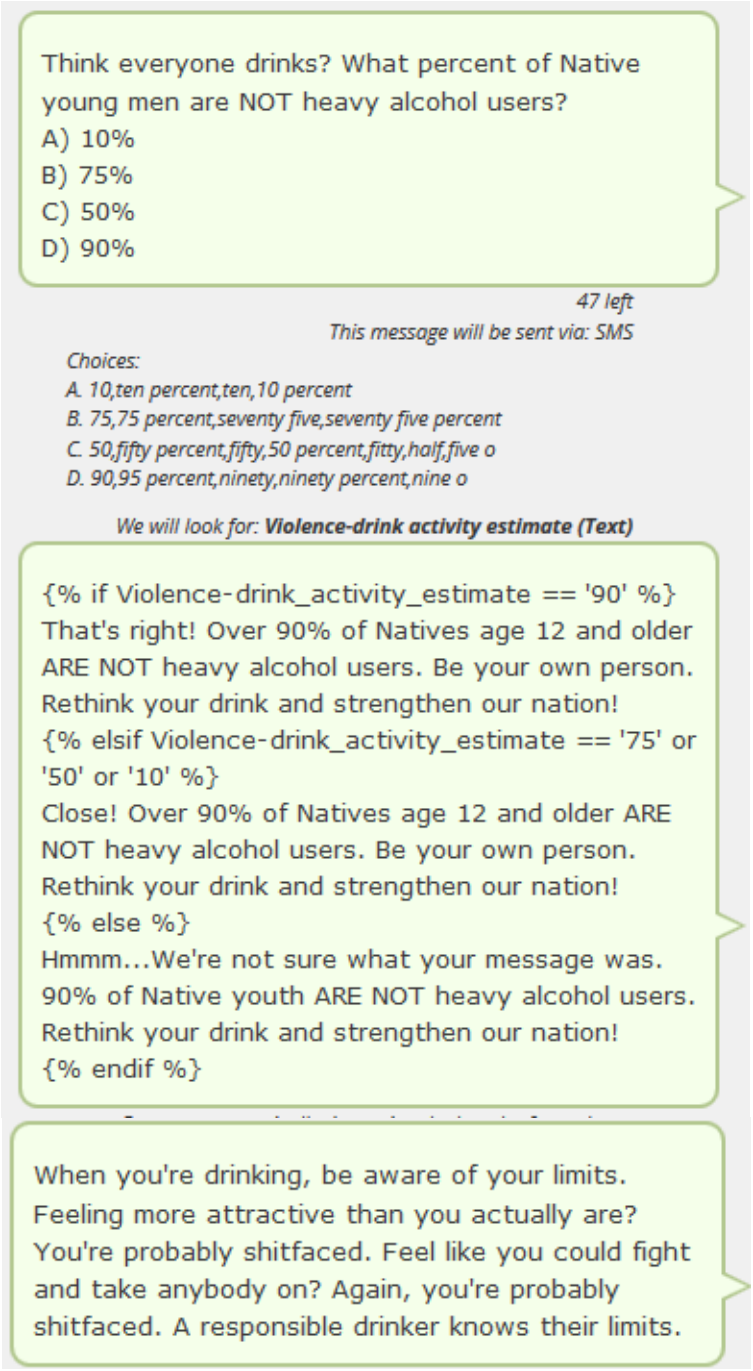


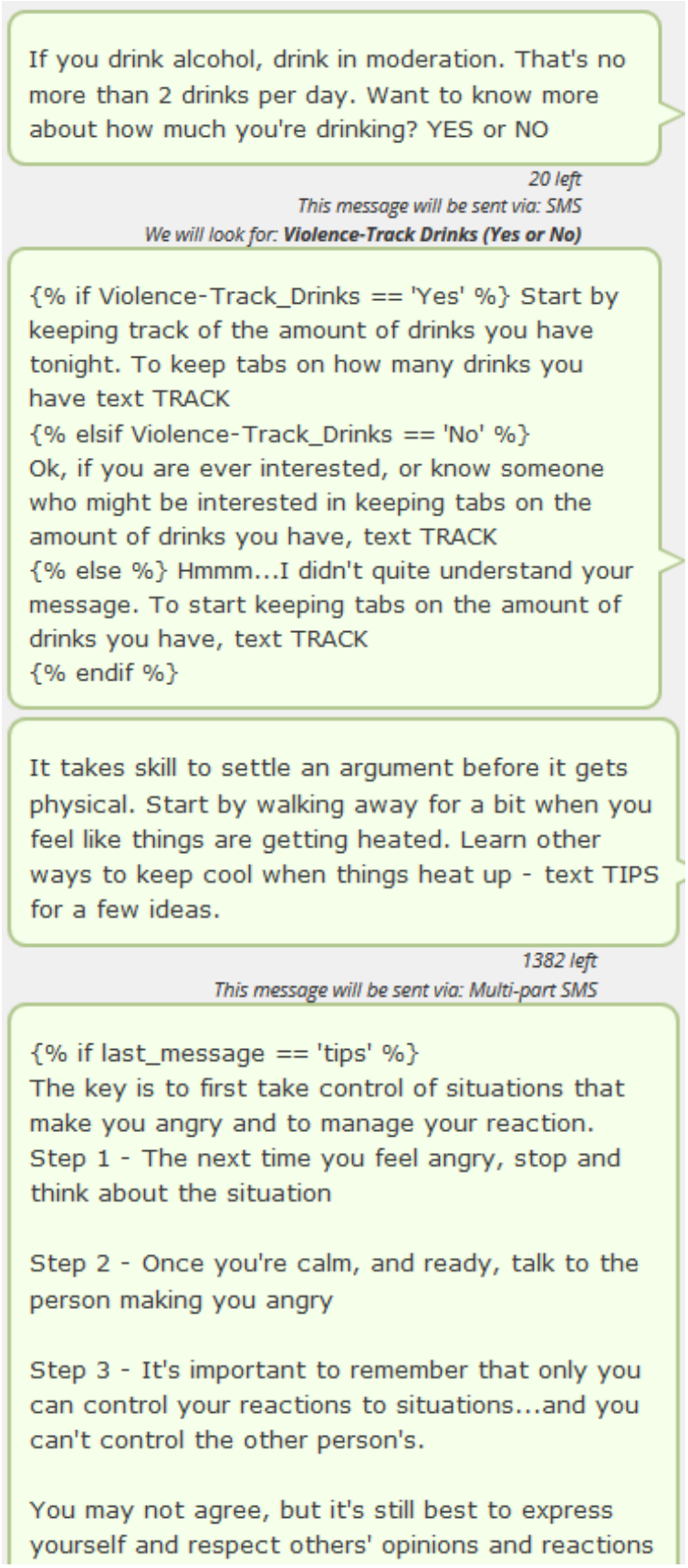
Participants also received individual text messages; these are presented below. After each text message, participants were asked to provide feedback about the message,

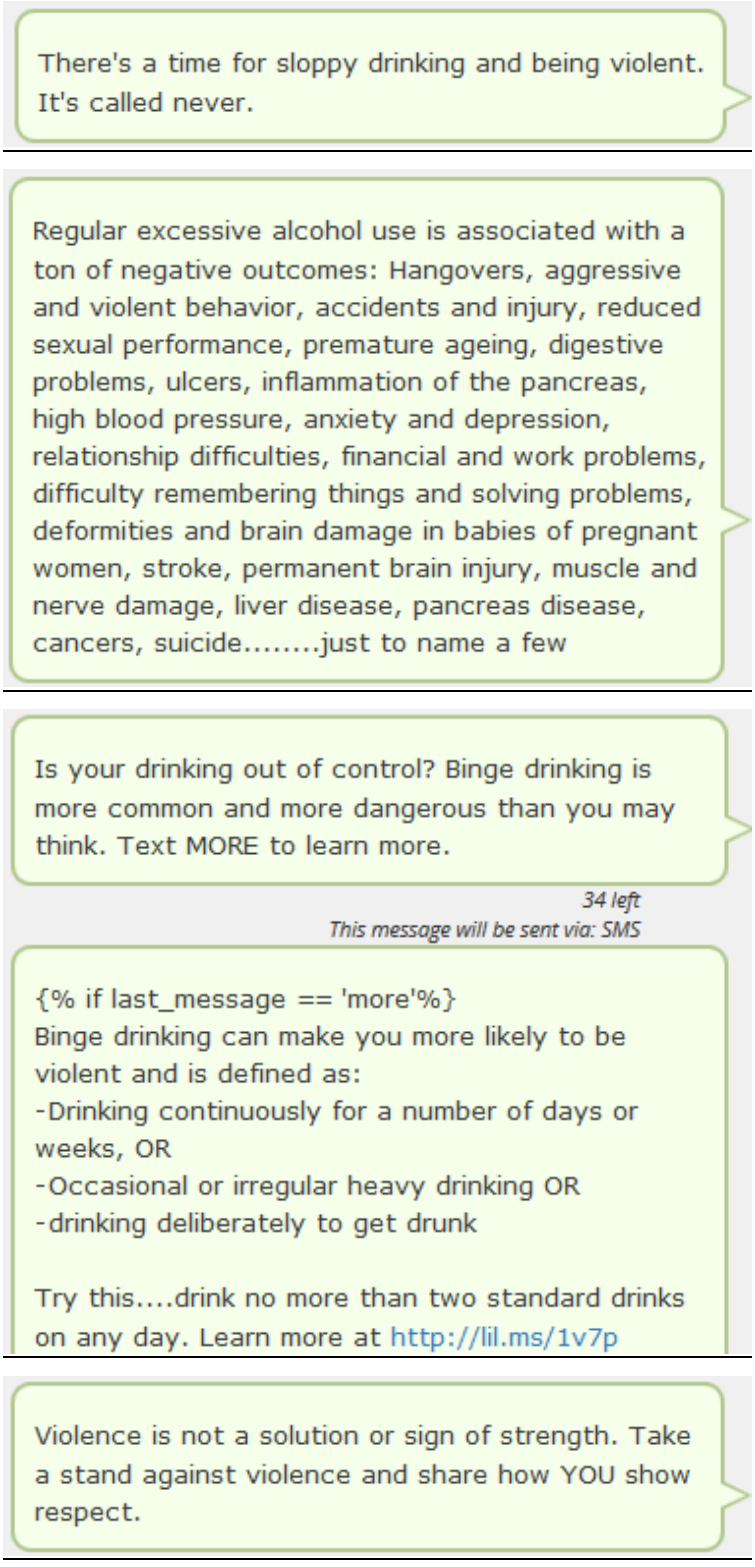
1) Did the last test seem useful or relevant? *Yes* or *No*

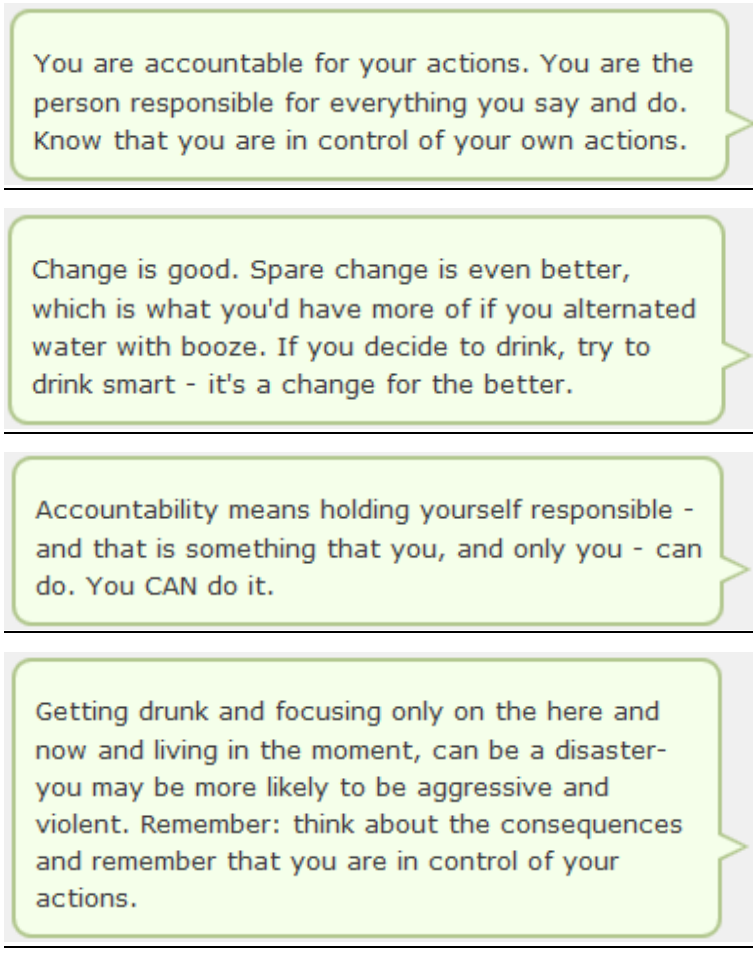
2) Is there anything you'd change or suggest we do differently? Open text response

The study team also monitored click-thru numbers to monitor participant engagement with the content.









Appendix C: Phase 2 Survey Questions

WERNATIVE

Rethink Your Drink Pre-Survey

Please enter the cell phone number that you are using to receive the Rethink Your Drink text messages:

1. What is your date of birth?
2. How old are you?
3. Are you currently enrolled in school?
4. Do you currently have a job?
5. How often do you have a drink containing alcohol?
6. How confident are you that you can talk to a friend about THEIR alcohol consumption, if you were worried about their drinking?
7. How confident are you that you can talk to a friend about THEIR violent or aggressive behavior, if you were worried about them?
8. In the last 3 months, how many times did you get into a physical fight?
9. In the last 3 months, how many times were you verbally mean or aggressive toward someone else?
10. How many times was alcohol involved?
11. In the last 3 months, how many times have you witnessed someone ELSE being verbally or physical aggressive toward someone?
12. How many times was alcohol involved?

Rethink Your Drink Post-Survey

Please enter the cell phone number that you are using to receive the Rethink Your Drink text messages:

1. What is your date of birth?
2. How old are you?
3. Are you currently enrolled in school?
4. Do you currently have a job?
5. How often do you have a drink containing alcohol?
6. How many drinks containing alcohol do you have on a typical day when you are drinking?
7. How often do you have 6 or more drinks on one occasion?
8. In the last 3 months, how often have you failed to do what was normally expected from you because of drinking?
9. Have you or someone else been injured as a result of your drinking?
10. In the next 6 months, how likely are you to drink enough alcohol to feel drunk or intoxicated?
11. In the next 6 months, how likely are you to get into a fight or argument while drunk or intoxicated?
12. Agree or Disagree: Drinking alcohol to feel drunk or intoxicated is completely normal.
13. Agree or Disagree: Drinking alcohol does not cause people to become angry or violent.
14. During the next 3 months, how often do you expect to consume enough alcohol to feel drunk or intoxicated?
15. During the next 3 months, how often do you expect to get in a fight or argument while drinking?

16. In the next 6 months, how confident are you that you can stop drinking before you feel drunk or intoxicated?

17. In the next 6 months, how confident are you that you can avoid getting in a fight or an argument while drinking?

18. How confident are you that you can talk to a friend about THEIR alcohol consumption, if you were worried about their drinking?

19. How confident are you that you can talk to a friend about THEIR violent or aggressive behavior, if you were worried about them?

20. In the last 3 months, how many times did you get into a physical fight?

21. How many times was alcohol involved?

22. In the last 3 months, how many times were you verbally mean or aggressive toward someone else?

23. How many times was alcohol involved?

24. In the last 3 months, how many times have you witnessed someone ELSE being verbally or physical aggressive toward someone?

25. How many times was alcohol involved?