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CHANGING ATTITUDES ABOUT CONCURRENCY AMONG YOUNG AFRICAN AMERICANS: RESULTS OF A RADIO CAMPAIGN

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Abstract

We created and evaluated an 8-month campaign of provocative radio ads to change attitudes about concurrent (overlapping) sexual partnerships among young African Americans. Using focus groups, vignette-based items, and factor analysis, we created a concurrency attitude scale and compared its score distributions in independent samples of African Americans, ages 18-34 years, interviewed by telephone before (n=678) and after (n=479) the campaign. Pre-and post-campaign samples reflected similar response rates (pre: 32.6%; post: 31.8%) and distributions of personal characteristics. Reported exposure to concurrency messages was greater after the campaign (pre: 6.3%, post: 30.9%), and mean scores became less accepting of concurrency (pre: 3.40 (95% confidence interval: 3.23, 3.57); post: 2.62 (2.46, 2.78)). Score differences were not a function of differences in composition of the two samples (adjusted means: pre: 3.37 (3.21, 3.53); post: 2.62 (2.47, 2.76)). Findings demonstrate that a carefully targeted, intensive mass media campaign can change attitudes about concurrency, which should facilitate behavior change.

Keywords

Concurrent partnerships; HIV interventions; African Americans; media campaigns; sexually transmitted infections; sexual behavior

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INTRODUCTION

Concurrent partnerships (partnerships that overlap in time) can facilitate HIV transmission at both individual and population levels. In the US, concurrency is more prevalent among people who are younger, men, unmarried; and report earlier age of sexual debut, binge drink, or use illicit drugs; and also more common among people whose partners have concurrent partners (Adimora, Schoenbach, & Doherty, 2007; Adimora, Schoenbach, Taylor, Khan, & Schwartz, 2011). This last finding underscores the network implications of concurrency and its potential population impact on HIV transmission. Several studies have documented a higher prevalence of concurrency among African Americans compared to Whites, a difference that may contribute to African Americans' substantially higher rates of heterosexually transmitted HIV infection (Adimora & Schoenbach, 2005; Adimora et al., 2007; Adimora et al., 2011; Morris, Kurth, Hamilton, Moody, & Wakefield, 2009). Moreover, while both partners sometimes approve of each other's non-monogamy, in other situations concurrency destroys long-term relationships and causes considerable distress (Adimora et al., 2001; Cates et al., 2015; Gorbach, Stoner, Aral, Whittington, & Holmes, 2002)

Qualitative and quantitative research indicate that powerful contextual forces, such as poverty and the unbalanced sex ratio among African Americans, promote concurrency in this population – and also suggest that structural interventions could influence this network pattern (Adimora & Schoenbach, 2002, 2005; Adimora et al., 2001; Adimora et al., 2013). However, the important influences of economic, criminal justice, and other societal factors in shaping sexual behavior do not exclude the possibility that knowledge and other interventions can influence attitudes, and in this way change concurrency behavior (Fishbein & Cappella, 2006).

Even a relatively small change could be beneficial, since simulation data suggest that slight decreases in concurrency could significantly disrupt network connectivity and yield substantial reductions in HIV transmission (Morris et al., 2009). For example, the decrease in HIV prevalence in Uganda following its multicomponent HIV prevention campaign targeting concurrency and condom use may reflect such an impact (Green, Halperin, Nantulya, & Hogle, 2006).

Mass media can reach more people than individual-level behavioral interventions (Noar, 2006). Studies reveal that radio is a powerful medium for delivery of health messages, including narrative-style health messages (Pappas-DeLuca et al., 2008; P.W. Vaughan, Regis, & St. Catherine, 2000), which can facilitate conversations between listeners and their partners about sexual health issues (Pappas-DeLuca et al., 2008). These narrative messages can connect the listening audience with the narratives' characters, thus engaging listeners and leading to attitude and behavior change (Slater & Rouner, 2002). Radio reaches a substantial proportion of the African American population; more than 90% of African American consumers listen to the radio each week (Arbitron, 2013). Radio stations that focus on African American audiences are a trusted source of information in many African American communities and are often used to disseminate health messages (Hall, Johnson-Turbes, & Williams, 2010).

Studies have demonstrated the favorable effects of media campaigns on behavioral intentions and behavior, such as condom use (Ross, Chatterjee, & Leonard, 2004; P. W. Vaughan, Rogers, Singhal, & Swalehe, 2000). Media campaigns have been developed in international settings to decrease concurrency, but in the U.S., only Andrasik et al. have reported (preliminary) results of a media campaign (Andrasik, Clad, Bove, Tsegaselassie, & Morris, 2015).

We designed and evaluated a radio campaign to change attitudes toward concurrency among young heterosexual African American adults in eastern North Carolina (Cates et al., 2015). Here we report the campaign's results.

METHODS

We used a systematic approach (National Cancer Institute, 2008; Noar, 2006) to design and test messages aimed at reducing acceptability of concurrent partnerships (Cates et al., 2015). Using an integrated theoretical framework, we developed an exploratory conceptual model for understanding African Americans' participation in concurrency. Our framework and model built principally on Fishbein's theory of reasoned action, (Fishbein, 2000; Fishbein & Cappella, 2006; Fishbein & Yzer, 2003) which holds that attitudes are one of the primary determinants of intention to perform a specific behavior and that if an individual with a strong intention to perform a behavior has the ability to perform the behavior and an absence of environmental constraints to its performance, there is a strong likelihood that the behavior will be performed (Fishbein, 2000). The behavior of interest in this research setting is forgoing either initiation of or continuation of a concurrent partnership or a sexual relationship with an individual who has a concurrent partner (Cates et al., 2015). Our model also integrates social constructionist frameworks of gender and power (Whitehead, 1997; Wingood & DiClemente, 2000). The campaign and the analysis presented here focus on changes in attitudes.

CAMPAIGN DEVELOPMENT AND IMPLEMENTATION

The campaign's development has been previously described (Cates et al., 2015). Briefly: We used health communication theories and methods to develop preliminary message concepts. We conducted focus groups with young African Americans in the target counties in order to identify factors that contribute to and/or protect against concurrency and to obtain feedback on draft messages. Messages were refined based on focus group results and then tested in intercept interviews among young African Americans in North Carolina counties outside the study area. Key messages were: stick to one partner at a time, end partnerships when you are not your partner's only partner, and use condoms consistently. The final set of ads included a few traditional (didactic) public service type announcements to introduce the concept of concurrency and brief (30 to 60-second) dramatic narratives involving a total cast of six young African American men and women in situations that illustrated various aspects of concurrent partnerships and included the key messages.

To produce the radio campaign we worked with Motivational Educational Entertainment Productions Inc. (MEE), a communications firm that specializes in developing culturally relevant messages for ethnic populations. A community advisory board of 15 African

American stakeholders from the target area gave feedback on the content of the ads and dissemination strategy, monitored community HIV prevention activities during the course of the campaign, and reported on general response to the ads from community members.

The radio campaign consisted of 11 ads that ran from July 2012 through February 2013; we purchased air-time on three stations with large listening audiences in the six-county study area whose programming was popular with the target audience (Cates et al., 2015). On average each ad was played about 280 times over the eight-month period.

CAMPAIGN EVALUATION

Confidential telephone surveys were administered before and after the 8-month radio campaign in independent samples of young African American adults who resided in one of six contiguous counties in eastern North Carolina (Edgecombe, Greene, Lenoir, Nash, Pitt, and Wilson), a predominantly rural region of the state, with high proportions of African Americans (34%-58% of total population) and high rates of HIV, STIs, and concurrency. (Adimora et al., 2004; Epidemiology and Special Studies Unit, 2015) Both surveys assessed (1) exposure to messages about concurrency and (2) attitudes and behavior related to participants' and their partners' concurrency. The post-campaign survey also assessed recall of campaign messages.

For each survey we used an electronic white page frame (Kish, 1949, 1965) that targeted 18 to 34 year-old African American men and women, with stratification by county so that the samples were proportional to population size. Respondents were non-institutionalized, spoke English, resided in one of the six study counties, lived in a place where they could be reached by a landline telephone, and (for the post-campaign survey) had not participated in the pre-campaign survey. Interviewers were trained; interviews were conducted by African American women, and respondents were paid $10 for participation. The institutional review board at the University of North Carolina at Chapel Hill approved all study procedures.

Of the 15,169 telephone numbers in the call sampling frame for the first survey (pre-campaign), 678 yielded completed interviews, 951 resulted in refusal by eligible respondents, 9,310 did not meet the study's eligibility requirements, and eligibility status could not be ascertained for 4,230. Proportion eligible (e) among individuals of unknown status = (678+951)/15,169 = 0.107. Response rate = 678/(678+951+(4,230*e)) = 32.6% (The American Association for Public Opinion Research, 2011). For the second (post-campaign) survey, 14,120 telephone numbers were in the call sampling frame, 479 interviews were completed, with 716 refusals, 9,244 ineligibles, and 3,681 of unknown eligibility. Proportion eligible (e) among individuals of unknown status = (479+716)/14,120. Response rate = 479/(479+716+(3,681*0.0846))=31.8% (The American Association for Public Opinion Research, 2011).

Pre-campaign interviews (conducted from February 29 through June 25, 2012) and post-campaign interviews (June 19 through November 4, 2013) had average durations of 17 and 27 minutes, respectively.

MEASURES

Attitudes Towards Concurrency—Our initial questions were created from validated items previously used to measure similar concepts (Basen-Engquist et al., 1999; Brafford & Beck, 1991; Pulerwitz & Barker, 2007; Pulerwitz, Gortmaker, & DeJong, 2000; St Lawrence et al., 1999). We pretested and piloted the resulting instrument among African Americans in the target age range outside the study counties, but there was little variability in responses: very few respondents endorsed concurrent partnerships as acceptable behavior. We then attempted to create items that would be more sensitive to differences in concurrency-related attitudes. The new items used vignettes incorporating fictional but realistic scenarios based on themes that emerged in the focus group discussions. In each item the respondent was presented with a situation and asked whether or not they thought the behavior was acceptable. For example: "A man has been in a relationship with his girlfriend for three years but she is always working and cannot fulfill his sexual needs. He has sex with an old girlfriend once every couple of months just to meet his needs. On a scale of 1 to 10, with 1 being not at all okay and 10 being completely okay, what number would you choose? You can choose any number 1 through 10." (Appendix 1 includes additional examples.) A concurrency attitude scale was developed and evaluated through a factor analysis of the vignette-style attitude items (Cope et al., 2016). Testing of the resulting one-factor six-item scale among a random sample of young African American men and women revealed good internal consistency (Cronbach's α =0.79). The scale was positively associated with participation in concurrent partnerships, whether determined by self-report ($r=0.298$, $p<0.0001$) or from sexual partnership dates ($r=0.298$, $p<0.0001$) (Cope et al., 2016). Pre-testing of this scale using the revised questionnaire among 16 male and female African Americans yielded more useful response distributions than the original items. The factor score was calculated as the average of responses to the 6 items in the concurrency attitude scale. Possible scores ranged between 1 and 10. A lower score indicates less acceptance of concurrency; a higher score denotes greater acceptance of concurrency.

Sexual Behavior, Concurrency, and Correlates of Concurrency—Participants were asked whether they were currently in a sexual relationship, how many sexual partners they had in the past year, and the first and last dates of sex for the three most recent partners. For the present report, participants with overlapping sexual partnerships at any point in the past six months were categorized as engaging in concurrency. For each of the three most recent partners, participants were also asked whether they thought the partner had other sexual partners during the relationship with the participant in the past six months. We examined the association between attitudes and variables found to be associated with concurrency in previous studies: age at interview, marital status, education, employment, food insecurity, and substance use (Adimora et al., 2014; Adimora et al., 2002; Adimora et al., 2007; Gorbach et al., 2002; Manhart, Aral, Holmes, & Foxman, 2002) .

Campaign Exposure—Respondents' awareness of the media campaign, including recall of specific motifs and messages, was assessed using both unaided (respondents were asked whether they had seen or heard anything about HIV prevention in the media, and then probed about their recollection of the campaign's messages) and aided recall (respondents were presented with specific phrases or slogans from the campaign and with audio clips of

the ads, and then asked if they remembered hearing them on the radio). Participants who recognized or remembered hearing the phrase ‘Escape the Web’ or who remembered hearing at least one of the ad clips were coded as recalling the campaign.

STATISTICAL ANALYSIS

Sample weights were computed as the product of base weights and adjustment factors (Kalsbeek & Agans, 2008). The base weights were computed using the sampling rate for telephone numbers in each stratum, with adjustment for the number of eligible respondents and landline telephone numbers in the household. The base weights were then further adjusted for differential household-level nonresponse among sampling strata, using the inverse of the stratum-specific household-level response rate as the adjustment factor. The nonresponse-adjusted household sample weight was then calibrated to population counts as estimated from the American Community Survey (US Census, 2010) sample, by cross-tabulating on marital status (married or single), age (18-24 or 25-34), and gender (male or female). Final weights were normalized to the total sample size (Flores-Cervantes & Kalton, 2008). All analyses were conducted using SAS (version 9.3, Cary, NC) and took the sample design features into account by using SURVEY procedures which included WEIGHT and STRATA statements.

Demographic characteristics, sexual behaviors, and other attributes were compared between pre- and post-campaign samples. We examined differences in the mean concurrency attitude factor score (described above) between pre- and post-campaign respondents by age, race/ethnicity, marital status, education, employment, food insecurity, drug use (smoked marijuana at least once in past year), binge alcohol consumption (at least four or five alcoholic drinks for women or men, respectively, on the same occasion on at least one day in the past 30 days), radio listening, sexual behaviors and knowledge of concurrency, using *t*-tests for independent samples. Multiple linear regression models were fit to assess changes in the mean concurrency attitude factor score by campaign wave. Based on a review of the literature, we adjusted models for demographic and HIV- risk characteristics, as well as participant and partner concurrency.

We used the Rao-Scott Chi-Square test for one-way tables, taking into account survey weights and strata to analyze the proportion of respondents in the post-campaign survey with high levels of campaign recall in relation to demographic, sexual behavior, and substance use characteristics. All statistical analyses (estimation, statistical tests, and regression models) accounted for the sampling design and sample weights.

RESULTS

DEMOGRAPHIC AND RISK CHARACTERISTICS OF PRE-AND POST-CAMPAIGN RESPONDENTS

A total of 1,157 people participated in the surveys (pre-campaign: 678; post-campaign: 479) (Table 1). Overall median age of respondents was 25 years (IQR pre-campaign: 20-30; post-campaign: 21-31). 57.6% were women. Most had never married (73.8%), had a high school diploma but less than a 4-year college degree (74.4%), and were employed (76.8%). A

substantial proportion reported food insecurity (14.6%). Almost one-third (30.2%) reported binge alcohol consumption, and almost one-quarter (23%) smoked marijuana during the preceding year. The largest differences between baseline and post-campaign survey respondents were in age (24.3% age 31-34 years for pre-campaign respondents vs. 31.4% for post-campaign) and marital status (pre-campaign respondents were more likely (76.3%) to have never married and not be cohabiting than post-campaign respondents (69.8%).

CAMPAIGN-RELATED BEHAVIOR AND KNOWLEDGE

Almost all respondents listened to the radio. Overall, 14.6% of respondents had a concurrent partnership during the past year, and 22.1% believed that a sex partner had a concurrent partner during their relationship with the respondent within the past year. Substantially greater proportions of post-campaign respondents reported having seen, heard, or read messages about concurrency (pre-campaign: 6.3%; post-campaign: 30.9%). Most respondents correctly identified concurrency from definitions provided during the interview, but a greater proportion of post-campaign respondents correctly identified concurrency (pre-campaign: 72.1%; post: 79.2%).

CONCURRENCY ATTITUDES

Overall, as quantified by the concurrency attitude score, attitudes became substantially (22.9%) less accepting of concurrency after the campaign (pre-campaign: 3.40; 3.23, 3.57; post: 2.62; 2.46, 2.78). In the unadjusted analysis (Table 2), the change was noted in all categories, though the change and the statistical evidence were weaker among those who were in the oldest age category (age 30-34), smoked marijuana, had a partner who had concurrent partners, had three or more partners during the preceding year, or did not listen to the radio.

We compared concurrency attitude scores between pre- and post-campaign respondents, adjusting for demographic and risk characteristics (Model A) and also for participant and partner concurrency (Model B), with and without stratification by gender (Table 3). All models indicated less acceptance of concurrency following the campaign, suggesting that the changes were not a function of the differences in demographic or risk characteristics of the pre- and post-campaign respondents.

CAMPAIGN RECALL

To assess the delivery of campaign messages, we evaluated campaign recall in relation to demographic and risk characteristics (Table 4). Women (64.5%) (vs men 54.9%) and respondents who were separated, divorced or widowed were more likely to remember the campaign, but there were few other differences in campaign recall by demographic or risk characteristics. As expected, campaign recall was higher for respondents who correctly identified the definition of concurrency or who reported: (1) listening to a campaign station, (2) having ever heard about concurrency, or (3) having discussed the ads with anyone else.

DISCUSSION

We designed and evaluated a radio campaign in eastern NC to test the feasibility of modifying young African American men and women's attitudes to become less accepting of concurrent partnerships. Pre- and post-campaign random sample telephone surveys that evaluated the campaign's efficacy demonstrated a substantial shift in attitudes, with a decrease in acceptability of concurrency across essentially all demographic and risk groups within the target population. This analysis suggests that culturally tailored radio ads may be an effective method of influencing young African American men and women's attitudes about concurrency.

This study is, to our knowledge, the first report of the efficacy of a radio campaign concerning concurrency in the US. Andrasik et al.'s 3-month media campaign in Seattle to educate Black residents about concurrency and HIV transmission consisted of flyers in local store windows, palm cards, advertisements in ethnic newspapers plus several ads on local public radio and community cable channels (Andrasik et al., 2015). The Seattle preliminary post-campaign evaluation demonstrated high reach, acceptability, and self-reported impact on concurrency-related knowledge and attitudes among the 116 people interviewed through street-intercept surveys. In contrast, our campaign focused exclusively on ads played on commercial radio stations — and evaluated randomly selected samples of the target population before and after the campaign.

The radio campaign reached a substantial proportion of our non-urban target population. Despite the proliferation of media vehicles, over 90% of survey respondents reported listening to the radio. Moreover, the campaign strategy ensured that the ads received considerable air time. During the eight months of the campaign, each of the 11 ads was played an average of 283 times, including during prime listening times, on radio stations that were popular with the target audience. About 60% of post-campaign respondents reported some recollection of the ads, and almost one-third reported having seen, read, or heard about concurrency after the campaign, compared to only 6% of controls (pre-campaign respondents). Although many people correctly identified concurrency before the campaign began, the proportion of respondents who correctly defined concurrency was significantly higher after the campaign.

The direction and consistency of the shift in attitudes among young adults — a developmental period often marked by increased risk-taking — are noteworthy. Acceptability of concurrency did not increase in any demographic or risk category. As anticipated, we observed only slight reductions in reported participation in concurrency itself; we believe more time would be required to observe a change in concurrency at the population level resulting from this level of campaign exposure. A longer, more extensive (e.g., television) campaign may be able to accomplish behavior change, although given the significant sociopolitical and economic forces that promote current sexual network patterns among African Americans, structural interventions that effect meaningful economic and demographic changes will be important for decreasing concurrency (Adimora & Schoenbach, 2005; Adimora et al., 2013). Nevertheless, the study's results demonstrate a shift in attitudes, which helps set the stage for future behavior change.

We encountered no resistance from either community members or radio stations, despite the politically and socially conservative nature of the target geographic area. In fact, community advisory members anecdotally reported that community response was positive, noting expressions of appreciation that partnership patterns were being addressed. In contrast, although the Seattle ads proved acceptable to the study's street intercept respondents, the company responsible for advertising on buses and trains in target areas refused to carry the study-developed PSAs (Andrasik et al., 2015). The different community responses might reflect the different content of the Seattle campaign, which aimed to inform the community about concurrency but did not explicitly recommend a specific behavioral change, and our campaign, which discussed the consequences of concurrency and urged listeners to "stick with one partner" and to use condoms. In addition, our campaign involved only radio ads without visual representation, as opposed to photographs. Also, rather than PSAs, the vehicle for our messages was commercial radio ads, where the radio station has a direct financial incentive, and somewhat provocative content is common. Finally, key community stakeholders were included in the planning of the campaign: one of the radio station owners, an African American man who resided in the region, sat on the community advisory board.

This study has several limitations. Our ads were developed specifically for the general young adult African American listening audience in Eastern NC. The ads' efficacy and acceptability for individuals of other racial/ethnic backgrounds or age groups — or even African Americans of the same age range in other geographic areas — are unknown. Nevertheless the acceptability of our ads in other areas can be tested, and the strategies used to develop this intervention can readily be adapted for similar campaigns in other populations.

For logistic and financial reasons, we limited our sampling frame for the surveys to households with landlines, a strategy that can result in selection bias (Hu, Balluz, Battaglia, & Frankel, 2011) through its exclusion of people who live in households with only wireless phones (Blumberg & Luke, 2014). At the time of this study, it was not possible to target age, race, or geographic region by cell phone use. Although respondents in our surveys had to live in households with a landline, most (84%) had cell phones themselves, similar to the 92% prevalence of cell phone ownership among African Americans estimated by national surveys (Smith, 2014).

Our response rates (just over 30%) were much lower than response rates for respondents in 18 states surveyed for the Behavioral Risk Factor Surveillance System by landline in 2008 (range 36.8% - 64.4%) (Hu et al., 2011). Phone survey response rates, however, have substantially declined in recent years. The Pew Research Center's phone survey response rate fell from 36% in 1997 to 9% by 2012; increasing the time frame for data collection boosted the response only to 22% (Pew Research Center, 2012). Thus, our response rates compare relatively favorably to recent trends.

Our study design does not exclude the possibility that the observed changes in attitudes were due to factors other than the radio campaign. However, discussions with community advisory board members who lived and worked in the study area revealed no evidence of

interventions that targeted concurrency or new community HIV prevention initiatives during the course of the study.

A strength of the intervention we tested is its use of mass media, an intervention strategy that is capable of reaching a large number of people, many of whom are at risk for infection but would not be reached by traditional behavioral interventions that target individuals or small groups. Radio dissemination of the messages was relatively inexpensive and enabled coverage of a large rural area that would have been difficult to cover with posters and flyers. Testing the intervention's efficacy with independent cross-sectional surveys instead of repeat testing on the same study population decreased the potential for testing sensitization.

CONCLUSIONS

The results of this study suggest that a carefully tailored, intensive mass media campaign can change attitudes about concurrency. Future studies should assess mass media campaigns' efficacy in changing attitudes toward concurrency among other populations – and ultimately evaluate media campaigns' efficacy in effecting behavior change and decreasing HIV transmission.

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Appendix A: Vignette Items Included in Concurrency Attitude Factor Scale

A man doesn't want to be tied down in a serious relationship so he has a couple of girlfriends that he hooks up with on a regular basis.
A woman does not want to be in a serious relationship so she has a couple of male friends who she sometimes has sex with.
A man had a serious girlfriend in high school and they have a child together. They are both having sex with other people but sometimes when the man comes to pick up or drop off his child, they have sex.
A woman and the man she used to be with still have feelings for each other and have sex once in a while.
A man and his girlfriend are living together but have been having relationship problems for months. A week ago a woman he met at a party came on to him really strongly, and they end up having sex at her place.
A man has been in a relationship with his girlfriend for three years but she is always working and cannot fulfill his sexual needs. He has sex with an old girlfriend once every couple of months just to meet his needs.

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Table 1

Changing Concurrency Attitudes: Characteristics of the Pre- and Post-Campaign Study Populations

	Pre-Campaign N=678			Post-Campaign N=479			
	N	%[1]	95% CI	N	%	95% CI	p[2]
Age							
18-24	256	46.4	42.1, 50.7	190	45.7	40.8, 50.6	*
25-30	223	29.3	25.6, 33.1	131	23.0	19.1, 26.9	
31-34	198	24.3	20.9, 27.7	158	31.4	27.0, 35.7	
Gender							
Male	237	40.9	36.5, 45.2	177	44.4	39.5, 49.3	
Female	441	59.1	54.8, 63.5	302	55.6	50.7, 60.5	
Marital status							
Married	98	11.2	8.8, 13.5	67	12.0	9.0, 15.0	*
Cohabitating	61	7.3	5.2, 9.4	68	12.6	9.4, 15.8	
Separated, Divorced or Widowed	38	4.8	3.1, 6.4	26	5.4	3.2, 7.5	
Never married	479	76.3	73.0, 79.7	317	69.8	65.4, 74.1	
Education							
College (4 years or more)	127	17.1	14.0, 20.1	95	19.8	15.9, 23.7	
High School & Some College	502	74.5	70.8, 78.2	354	74.2	69.9, 78.5	
Some high school	46	8.0	5.5, 10.5	30	6.0	3.7, 8.3	
Less than high school	2	0.3	0.0, 0.7	0	0.0	–	
Employment Status							
Employed for wages	518	77.5	73.9, 81.1	364	75.8	71.6, 80.1	
Food Insecurity							
Concerned about having enough food in the past month	97	13.1	10.3, 15.9	81	16.6	13.0, 20.2	
Alcohol & Drug Use							
Binge Drinking in past month [3]	203	30.1	26.2, 34.1	141	30.6	26.0, 35.2	
Smoked marijuana in past year	144	23.2	19.5, 26.9	99	22.9	18.6, 27.1	
Sexual Behavior (past 6 months)							
Concurrent Partnerships [4]	69	14.2	10.7, 17.7	41	12.7	8.9, 16.6	

	Pre-Campaign N=678			Post-Campaign N=479			
	N	%[1]	95% CI	N	%	95% CI	p[2]
Partner Concurrency [5]	43	8.1	5.4, 10.7	28	8.6	5.4, 11.9	
Campaign Related Behavior & Knowledge							
Listened to the radio [6]	643	94.7	92.7, 96.6	441	91.6	88.8, 94.3	
Ever seen, heard or read any messages about sexual concurrency	39	6.3	4.1, 8.5	144	30.9	26.3, 35.4	***
Correctly identified concurrency via definition	496	72.1	68.3, 76.0	379	79.2	75.2, 83.3	**

Note.

[1] Weights were developed as described in the methods section and used to calculate percentages and 95% confidence intervals.

[2] P values

* <0.05;

** <0.01;

*** <0.0001

[3] Having five or more (men) / four or more (women) alcoholic drinks on the same occasion on at least one day in the past 30 days.

[4] Overlap in reported dates of sexual partnerships.

[5] Participant said that partner had other sexual partners during the relationship with the participant.

[6] Spending one or more hours per week listening to the radio.

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Table 2

Mean Concurrency Attitude Factor Scores Among Pre-Campaign and Post- Campaign Respondents (Unadjusted)

	Pre-Campaign Score N=678*		Post-Campaign Score N=479		Difference between Pre & Post-Campaign Scores		
	Mean Score	95% CI	Mean Score	95% CI	Difference in Scores	95% CI	p [1]
Mean Concurrency Attitude Factor Score [2]	3.40	3.23, 3.57	2.62	2.46, 2.78	−0.78	−1.01, −0.54	***
Age							
18-24	3.49	3.24, 3.74	2.78	2.52, 3.04	−0.71	−1.07, −0.36	***
25-30	3.71	3.38, 4.05	2.52	2.21, 2.82	−1.20	−1.65, −0.75	***
31-34	2.84	2.57, 3.11	2.47	2.20, 2.75	−0.37	−0.76, 0.03	
Gender							
Male	3.96	3.65, 4.27	3.20	2.91, 3.48	−0.76	−1.18, −0.34	**
Female	3.01	2.84, 3.18	2.16	2.00, 2.32	−0.85	−1.08, −0.61	***
Marital status							
Married	3.21	2.76, 3.66	2.38	1.88, 2.89	−0.82	−1.50, −0.14	*
Cohabitating	3.44	2.86, 4.02	2.41	2.00, 2.81	−1.03	−1.73, −0.33	**
Separated, Divorced or Widowed	3.39	2.77, 4.01	2.22	1.69, 2.76	−1.16	−1.98, −0.35	**
Never married	3.42	3.22, 3.61	2.74	2.54, 2.93	−0.68	−0.96, −0.40	***
Education							
College (4 years or more)	3.37	2.99, 3.75	2.46	2.08, 2.84	−0.91	−1.45, −0.38	**
High School & some College	3.30	3.12, 3.49	2.65	2.46, 2.83	−0.66	−0.92, −0.39	***
Some high school	4.26	3.47, 5.05	2.87	2.30, 3.43	−1.39	−2.37, −0.42	**
Less than high school	5.79	−4.53, 7.05	–	–	NA	NA	
Employment Status							
Employed for wages	3.36	3.17, 3.55	2.53	2.34, 2.71	−0.83	−1.10, −0.57	***
Unemployed	3.47	3.09, 3.84	2.90	2.56, 3.24	−0.57	−1.07, −0.06	*
Food Insecurity							
Concerned about having enough food in the past month	3.76	3.30, 4.21	2.70	2.29, 3.11	−1.05	−1.67, −0.44	**
Not concerned about having enough food in the past month	3.34	3.16, 3.52	2.61	2.43, 2.78	−0.74	−0.99, −0.49	***
Alcohol & Drug Use							
Binge drinking in past month [3]	3.94	3.63, 4.26	3.12	2.79, 3.44	−0.83	−1.28, −0.37	**

	Pre-Campaign Score N=678*		Post-Campaign Score N=479		Difference between Pre & Post-Campaign Scores		
	Mean Score	95% CI	Mean Score	95% CI	Difference in Scores	95% CI	p [1]
No Binge drinking in past month	3.17	2.97, 3.36	2.40	2.22, 2.58	−0.77	−1.03, −0.50	***
Smoked marijuana in past year	4.06	3.73, 4.40	3.79	3.39, 4.18	−0.27	−0.79, 0.25	
Did not smoke marijuana in past year	3.20	3.01, 3.39	2.28	2.12, 2.43	−0.92	−1.16, −0.68	***
Sexual Behavior (past 6 months)							
Concurrent partnership [4]	4.95	4.50, 5.41	3.98	3.37, 4.60	−0.97	−1.74, −0.20	*
No concurrent partnership	3.27	3.08, 3.45	2.61	2.41, 2.81	−0.66	−0.93, −0.38	***
Partner concurrency [5]	4.92	4.39, 5.45	4.25	3.46, 5.04	−0.67	−1.62, 0.29	
No partner concurrency	3.30	3.12, 3.47	2.51	2.34, 2.67	−0.79	−1.02, −0.55	***
Number of sex partners in past year							
0	2.79	2.09, 3.49	1.90	1.43, 2.36	−0.89	−1.73, −0.05	*
1	3.05	2.83, 3.27	2.29	2.10, 2.48	−0.76	−1.05, −0.47	***
2	3.86	3.56, 4.16	3.09	2.61, 3.57	−0.77	−1.34, −0.20	**
≥3	4.97	4.51, 5.43	4.53	4.03, 5.03	−0.44	−1.12, 0.24	
Campaign Related Behavior & Knowledge							
Listened to the radio [6]	3.39	3.22, 3.57	2.60	2.44, 2.77	−0.79	−1.03, −0.55	***
Did not listen to the radio	3.47	2.66, 4.28	2.83	2.19, 3.48	−0.64	−1.67, 0.40	
Ever seen, heard or read any messages about concurrency	4.14	3.31, 4.98	2.58	2.29, 2.87	−1.56	−2.45, −0.68	**
Never seen, heard or read any messages about concurrency	3.35	3.18, 3.52	2.66	2.45, 2.86	−0.69	−0.96, −0.43	***
Correctly identified concurrency via definition	3.38	3.18, 3.58	2.65	2.47, 2.84	−0.72	−1.00, −0.45	***
Did not correctly identify concurrency via definition	3.46	3.15, 3.77	2.47	2.13, 2.81	−0.99	−1.45, −0.52	***

Note.

[1] P values

* <0.05;

** <0.01;

*** <0.0001

[2] The score was derived from the concurrency attitude scale, which was developed from the vignette-style items (described in methods). Possible scores ranged between 1 and 10. A lower score indicates less acceptance of concurrency; a higher score denotes greater acceptance of concurrency.

[3] Having five or more (men) / four or more (women) alcoholic drinks on the same occasion on at least one day in the past month.

[4] Overlap in reported dates of sexual partnerships.

[5] Participant said that partner had other sexual partners during the relationship with the participant.

[6] Spending one or more hours per week listening to the radio.

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Table 3

Mean Concurrency Attitude Factor Scores (MCAFS) Among Pre- and Post-Campaign Respondents, by Gender

Unadjusted					
	MCAFS [1]	**95% CI**	**Difference Between Pre-and Post-Campaign Scores**	**95% CI**	**p** [2]
Total Cohort (N=1157)					
Pre-Campaign	3.40	3.23, 3.57	−0.78	−1.01, −0.54	***
Post-Campaign	2.62	2.46, 2.78			
Men (N=414)					
Pre-Campaign	3.96	3.65, 4.27	−0.76	−1.18, −0.34	**
Post-Campaign	3.20	2.91, 3.48			
Women (N=743)					
Pre-Campaign	3.01	2.84, 3.18	−0.85	−1.08, −0.61	***
Post-Campaign	2.16	2.00, 2.32			
Model A: Adjusted for demographic and risk characteristics [3]					
	MCAFS [1]	95% CI	Difference Between Pre-and Post-Campaign Scores	95% CI	p [2]
Total Cohort (N=1157)					
Pre-Campaign	3.37	3.21, 3.53	−0.75	−0.97, −0.54	***
Post-Campaign	2.62	2.47, 2.76			
Men (N=414)					
Pre-Campaign	3.85	3.55, 4.15	−0.77	−1.17, −0.38	**
Post-Campaign	3.08	2.82, 3.34			
Women (N=743)					
Pre-Campaign	3.04	2.87, 3.21	−0.80	−1.03, −0.57	***
Post-Campaign	2.24	2.08, 2.40			
Model B: Adjusted for variables in Model A + participant and partner concurrency (previous 6 months)					
	MCAFS [1]	95% CI	Difference Between Pre-and Post-Campaign Scores	95% CI	p [2]
Total Cohort (N=1157)					
Pre-Campaign	3.37	3.21, 3.52	−0.74	−0.94, −0.53	***
Post-Campaign	2.63	2.48, 2.77			
Men (N=414)					
Pre-Campaign	3.85	3.56, 4.13	−0.77	−1.15, −0.39	***

Unadjusted					
	MCAFS [1]	**95% CI**	**Difference Between Pre-and Post-Campaign Scores**	**95% CI**	**p** [2]
Post-Campaign	3.07	2.82, 3.33			
Women (N=743)					
Pre-Campaign	3.05	2.89, 3.21	−0.78	−0.99, −0.55	***
Post-Campaign	2.27	2.11, 2.44			

Note.

[1] MCAFS: Mean concurrency attitude factor score was derived from the concurrency attitude scale, which was developed from the vignette-style items (described in methods). Possible scores ranged between 1 and 10. A lower score indicates less acceptance of concurrency; a higher score denotes greater acceptance of concurrency.

[2] P values

* <0.05;

** <0.01

*** <0.0001

[3] Age, gender, marital status, education, employment, food insecurity, binge drinking in past month, marijuana use in past year.

Table 4

Demographic and Radio Listening Characteristics of the 296 Post-Campaign Participants Who Recalled the Campaign[1]

	N	%[2]	CI	p[3]
Age				
18-24	108	57.1	49.4, 64.8	
25-30	86	62.7	53.3, 72.1	
31-35	102	62.9	54.8, 71.0	
Gender				
Male	98	54.9	47.0, 62.8	
Female	198	64.5	58.5, 70.4	
Marital status				
Married	41	62.1	49.2, 75.1	*
Cohabitating	51	71.8	59.4, 84.1	
Separated, Divorced or Widowed	20	81.3	65.4, 97.2	
Never married	184	56.4	50.5, 62.4	
Education				
College (4 years or more)	52	52.0	40.6, 63.4	
High School & Some College	223	61.3	55.8, 66.9	
Some high school	21	73.1	55.5, 90.7	
Less than high school	0			
Employment Status				
Employed for wages	230	62.4	56.9, 67.8	
Unemployed	66	54.3	44.2, 64.4	
Food Insecurity				
Concerned about having enough food in the past month	55	66.0	54.4, 77.6	
Not concerned about having enough food in the past month	241	59.1	53.8, 64.4	
Alcohol & Drug Use				
Binge drinking in past month [4]	93	64.5	55.8, 73.2	
No Binge drinking in past month	200	57.9	52.1, 63.7	
Smoked marijuana in past year	59	57.9	47.0, 68.8	
Did not smoke marijuana in past year	236	60.7	55.3, 66.1	
Sexual Behavior (past 6 months)				
Concurrent partnership [5]	28	66.1	50.5, 81.6	
No concurrent partnership	268	59.6	54.5, 64.6	
Partner concurrency [6]	18	64.5	49.2, 79.7	
No partner concurrency	278	60.2	55.3, 65.2	
Number of sex partners in past year				
0	18	42.0	25.3, 58.8	*
1	178	66.3	60.1, 72.5	
2	36	64.7	51.3, 78.1	

	N	%[2]	CI	p[3]
≥3	30	57.2	44.0, 70.3	
Campaign Related Behavior & Knowledge				
Listened to one or more campaign stations	281	66.8	61.7, 71.8	***
Did not listen to any campaign stations	15	21.6	11.6, 31.6	
Ever seen, heard or read any messages about concurrency	123	82.4	75.3, 89.5	***
Never seen, heard or read any messages about concurrency	165	50.1	44.1, 56.1	
Correctly identified concurrency via definition	255	66.0	60.7, 71.2	***
Did not correctly identify concurrency via definition	36	39.5	28.4, 50.7	
Discussed the ads with anyone else	114	89.3	83.6, 94.9	***
Did not discuss the ads with anyone else	181	56.4	50.5, 62.3	

Note.

[1] A total of 479 people participated in the post-campaign survey. This table displays characteristics of the 296 post-campaign survey participants who were categorized as having a high recall (score of 3 or 4) (weighted percent=60.2%). Participants with high recall remembered the campaign slogan and were able to identify at least one of the ads.

[2] Percentages were calculated as the proportion of total post-campaign respondents in each category (e.g, age 18-24, etc) who had high recall of the campaign. Weights were developed as described in the methods section and used to calculate percentages and 95% confidence intervals.

[3] P values

* <0.05;

** <0.01

[4] Having five or more (men) / four or more (women) alcoholic drinks on the same occasion on at least one day in the past 30 days.

[5] Overlap in reported dates of sexual partnerships.

[6] Participant said that partner had other sexual partners during the relationship with the participant.