

# Using Facebook as a Platform to Direct Young Black Men Who Have Sex With Men to a Video-Based HIV Testing Intervention: A Feasibility Study

*Thomas Alex Washington,<sup>a</sup> Sheldon Applewhite,<sup>b</sup> and Wendell Glenn<sup>c</sup>*

**Objective:** A randomized control pilot study was conducted with Black men who have sex with men (BMSM;  $N = 42$ ) aged 18–30 years to examine the feasibility of implementing a video intervention delivered using Facebook to motivate HIV testing. **Methods:** At baseline, participants were unaware of their HIV status and had not tested for HIV in the past 6 months, residing in Los Angeles County. The intervention content included topics such as social influence, HIV knowledge, stigma, HIV positive knowledge, and benefits of knowing one's HIV status. **Findings:** Logistic regression revealed that those receiving the video intervention were 7 times more likely to have tested for HIV than those in the control group at 6-week follow-up (odds ratio [OR] = 7.00, 95% confidence interval [1.72, 28.33],  $p = .006$ ). **Conclusion:** Data suggest that the intervention was feasible for motivating HIV testing.

**Keywords:** HIV testing; men who have sex with men (MSM); Black men's health; social media; HIV intervention

**H**IV prevention and testing remain a high priority for reducing HIV infections among young Black men who have sex with men (BMSM; Centers for Disease Control and Prevention [CDC], 2015; Fenton, 2007). The number of new infections among young BMSM was nearly twice that of young White MSM and more than twice that of young Hispanic/Latino MSM (CDC, 2010a, 2010c, 2015). Moreover, young BMSM ages 13–29 accounted for new HIV infections (52%) among all BMSM (CDC, 2015). This disproportionate representation of new infections is greater than any other racial or ethnic age group of MSM (CDC, 2015).

---

<sup>a</sup>College of Health and Human Services, School of Social Work, California State University, Long Beach, CA, USA

<sup>b</sup>Department of Sociology, Borough of Manhattan Community College, City University of New York, New York, NY, USA

<sup>c</sup>ADAM Project, Behavioral Health Services, Long Beach, CA, USA

Previous research (CDC, 2010b) indicated that one in five (19%) MSM in 21 major U.S. cities were infected with HIV, and nearly half (44%) were unaware of their infection; BMSM (28%) accounted for the highest prevalence (CDC, 2010c). Knowledge of HIV status is of major importance for several reasons. Those who are HIV negative may be provided knowledge of current advances for prevention, such as preexposure prophylaxis (PrEP; Pérez-Figueroa, Kapadia, Barton, Eddy, & Halkitis, 2015). Knowing one's HIV positive status allows the individual to link to treatment, reducing viral load and the likelihood of progression of the disease (Kitahata et al., 2009; Robbins et al., 2009). In addition, reduced viral load reduces the risk of transmission to uninfected partners (Castilla et al., 2005; Porco et al., 2004; Quinn et al., 2000; Reynolds, Makumbi, & Kayaagi, 2009; Sullivan et al., 2010). Furthermore, previous research suggests that men who are unaware of their HIV-positive status are more likely to engage in risky behavior, putting their HIV-negative partners at-risk for HIV-infection, than those men who are aware of their positive status (Millet, Peterson, Wolitski, & Stall, 2006; Reynolds et al., 2009; Washington, Robles, & Malotte, 2013).

Given the aforementioned facts, prevention efforts and interventions for motivating HIV testing for young BMSM still remain urgent. The CDC has encouraged and funded HIV prevention programs (i.e., diffusion of effective behavioral interventions) focusing on gay men, young MSM, and other programs geared toward MSM, including ethnic MSM (CDC, 2009b). Although some of these and other HIV prevention programs have encouraged HIV testing (CDC, 2010c; Phillips et al., 1995), and others may have required HIV testing as a precursor to program enrollment, these programs have not focused primarily on motivating HIV testing among BMSM. Many of these programs have focused solely on HIV prevention among injection drug-using MSM (CDC, 2009a). Because of their elevated risk of infection and prevalence of new HIV infections among BMSM, it is critical to ensure that sexually active young BMSM get tested for HIV every 3–6 months (Campsmith, Rhodes, Hall, & Green, 2010; CDC, 2011). Consequently, there is a need to have innovative interventions that aim to encourage HIV testing tailored specifically for BMSM aged 18–29 years. Most studies that have focused on encouraging testing among MSM were not developed as HIV prevention programs tailored specifically for BMSM aged 18–29 years, and did not focus on specific barriers to HIV testing as perceived by these men (Erbelding & Zenilman, 2005).

CDC launched a public campaign, "Testing Makes Us Stronger," to encourage HIV testing among BMSM (Prejean et al., 2011). In addition to promotional material, the campaign features online and print ads. Nonetheless, because of the elevated risk of infection and prevalence of new HIV infections among BMSM aged 18–29 years, it is critical to explore innovative multimedia interventions including videos with social networking chat features to ensure that sexually active young BMSM get tested for HIV every 3–6 months. There is evidence that gay men who have disclosed their sexual orientation with a supportive peer network have reduced internalized homophobia, and thereby, reduced risk behavior (Newman & Zimmerman, 2000; Washington et al., 2006). However, many young BMSM are not in this position and HIV prevention and intervention methods are needed that may be accessible to them.

Social networking technology, such as Facebook and text messaging, is a widely used feature, particularly among youths; more than 3.5 billion text messages are

sent every day worldwide (Kline et al., 2001; Tsirulink, 2008). This technology is being used already in other sectors, such as social networking and sex seeking websites (e.g., Grindr mobile, adam4adam.com; Chiasson, Hirshfield, & Rietmeijer, 2010; Klein, Lambing, Moskowitz, Washington, & Gilbert, 2010; Washington & Thomas, 2010). Recent health related research indicated that multimedia is a feasible method to deliver health intervention (Blas et al., 2007; Cornelius, Cato, St. Lawrence, Boyer, & Lightfoot, 2011; Levine, Madsen, Barar, Wright, & Bull, in press; Whittaker et al., 2011; Whittaker et al., 2008; Wright, Fortune, Juzang, & Bull, 2011; Ybarra & Bull, 2007). As online and mobile text messaging evolve, it is critical to examine the utility of highly used technology and social networking sites, such as Facebook, as a method for delivering HIV prevention information, and interventions to motivate HIV testing among young BMSM (Holt et al., 2011; Kline et al., 2001; Rosser et al., 2011; Wilkerson, Danilenko, Smolenski, Myer, & Rosser, 2011).

Previous studies have examined the impact of online video-based interventions on different outcomes, such as acquisition of new sexually transmitted disease (STD) infections among patients attending STD clinics (Myint et al., 2010; Warner et al., 2008); future planning behaviors among HIV concordant positive and discordant couples in Zambia (Stephenson et al., 2008) and self-disclosure of HIV status and HIV risk behaviors (Chiasson, Shaw, Humberstone, Hirshfield, & Hartel, 2009). One study examined the effectiveness of an online HIV video intervention to increase intentions to test among Peruvian MSM (Caetano, Clark, & Tam, 1998). Although the study included HIV testing intentions as an outcome to assess the efficacy of the intervention, the video intervention did not address specific barriers to HIV testing identified by Black males, aged 18–29, who reside in the United States.

The use of web-based programs has grown, and this growth will most likely continue (Caetano & Clark, 1998; Grimley & Hook, 2009; Kline et al., 2001; Mikolajczak, Hospers, & Kok, 2006). Furthermore, online video-based interventions have been used for HIV prevention and testing (Caetano & Clark, 1998; Stephenson et al., 2008; Warner et al., 2008). Likewise, online campaigns have been used to promote sexual health among MSM (Gilbert, Levandowski, Scanlon, & Peterson, 2010). One study (Caetano & Clark, 1998) provides evidence that a video-based intervention increases intentions to test for HIV in a sample of nongay males in South America. To the best of our knowledge, few studies have examined the efficacy of delivering an online HIV-testing intervention (Lorenc et al., 2011; S. D. Rhodes et al., 2011). Nevertheless, findings from the few studies suggest that chat room-based HIV testing intervention may increase testing among MSM who may be difficult to reach in traditional physical spaces (S. D. Rhodes et al., 2010). For example, S. D. Rhodes et al. (2011) culturally congruent intervention designed to promote HIV testing among MSM within existing Internet chat rooms. The findings from the intervention revealed a significant increase in self-reported HIV testing among chatters overall, increasing rates from 44.5% at pretest to nearly 60% at posttest. Furthermore, a database search revealed few studies that have explored the use of Facebook (Bull et al., 2011). The studies using Facebook have focused on topics, such as sexual health, HIV education, influence of religion on behaviors, recruitment strategies, and social networks (Bull et al., 2011; Bull, Levine, Black, Schmiege, & Santelli, 2012; Hunter et al., 2014; Vial, Starks, & Parsons, 2014; Washington, Patel, & Meyer-Adams, 2015; Young, Dutta, & Dommetty, 2009; Young, Holloway,

et al., 2014; Young & Jordan, 2013; Young, Shakiba, Kwok, & Montazeri, 2014). No studies were revealed that aimed to deliver a motivational video intervention to increase HIV testing uptake among young BMSM with preintervention and postintervention assessment of risk behaviors and HIV testing uptake.

The present study sought to address this gap by examining the feasibility of implementing a video intervention to motivate HIV testing uptake among BMSM using Facebook. It is distinct from previous research in that the content was informed by, and focused explicitly on, young BMSM. The intervention content was developed using qualitative findings from a previous study involving young BMSM. The content was then pretested by young BMSM and finalized using feedback from young BMSM. Facebook features were used to direct participants to the intervention.

The HIV intervention was guided by the *integrative model of behavior change*, which has been expanded into an intervention-oriented model of behavioral action (Fishbein & Ajzen, 1975; Fishbein et al., 2001; F. Rhodes & Malotte, 1996). Theoretical elements and social and environmental factors are linked together in a single conceptual framework emphasizing the components that are most susceptible to change. The elements in this model are considered to be directly influenced by an intervention are as follows: (a) HIV knowledge (including substance use as risk), (b) behavioral beliefs, (c) self-regulation skill and ability, (d) social supports (social network including online peer influences), and (e) engagement in self-management behavior.

## METHOD

### Participants and Procedure

BMSM in Los Angeles County were recruited for this study. The inclusion criteria included the following: Black/African American male, aged 18–30 years, had sex with a man in the past 3 months by self-report, HIV status unknown and have not tested for HIV at least within the past six months, resident of Los Angeles County, California, had condomless receptive or insertive anal sex at least once in lifetime, English speaking, and a valid e-mail address. Potential participants were excluded if they self-reported having received an HIV test (and results) within the past 6 months or if they reported known HIV-positive status. In an effort to recruit BMSM who may not frequent gay-identified spaces, and to reduce the role of stigmatization and bias of recruiting a diverse group of BMSM, the study was advertised as the “TIM Project: A Young Black Men’s Health Study.” Participants were recruited in person at community-based organizations serving Black males at high risk and online via social media (e.g., Facebook, Twitter, Black Gay Chat). There was a cost for the social media banner ads. The online recruitment was limited; the majority of the participants who used the Internet for screening were not eligible because of the strict HIV testing history criterion. The in-person recruitment efforts were more yielding than the online recruitment. The study was approved by the institutional review board, and all participants consented to participate.

Enrollment occurred after screening, and randomization occurred after completion of the baseline survey. Recruitment, enrollment, and follow-up occurred between April 2014 to October 2014 (Figure 1). Follow-up occurred 6 weeks after

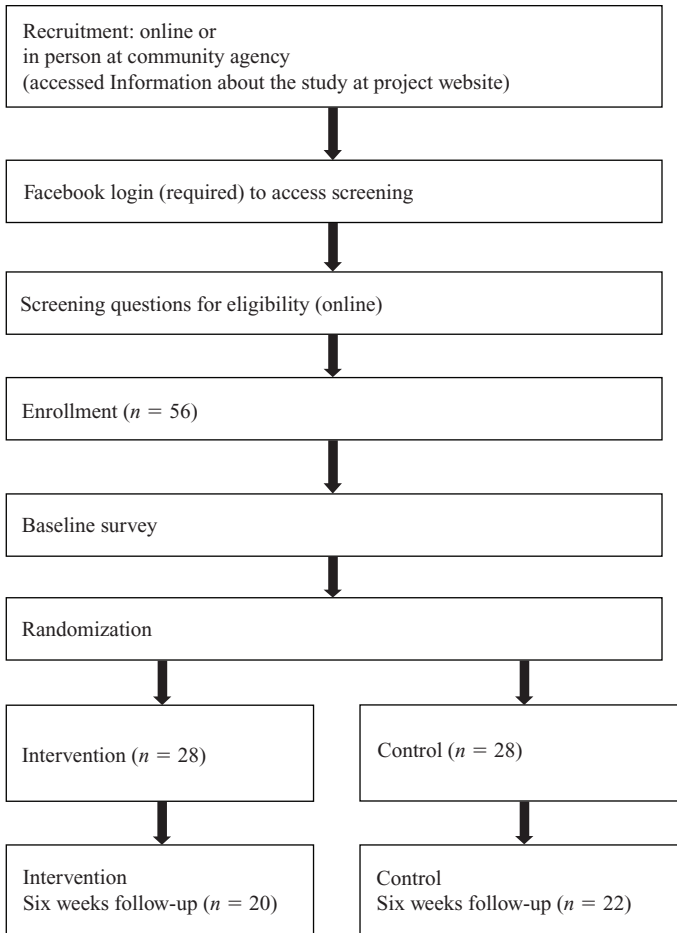


Figure 1. Illustration of flow of the study.

enrollment. All advertisements included the project’s URL link to access the study’s page from their personal computers, smart phones, or tablets were available for those recruited at community-based organizations and community events. Participants were asked to sign in to their Facebook account to complete the screening process. Participants were screened for eligibility online. Eligible participants were given instructions and sent an e-mail to the e-mail associated with their Facebook account. The e-mail included further details about the study and informed consent material. Once the participants had completed the informed consent, they were directed to complete the baseline survey online and were then randomly assigned to either the testing intervention model (TIM) Project group (video intervention) or the Health Information group (control). A final eligibility requirement was to “like” the Facebook group page to which they have been assigned. After clicking the “like” feature, the participant began to receive weekly messages and updates about the study when they logged on to their Facebook page. Both groups were asked to post

comments on the group page in reaction or response to the content they viewed. A private space was set-up on Facebook that participants could “like.” Setting a private space on Facebook to use the like feature, and sending participants messages via Facebook message feature, allowed for greater privacy; participants could access the study information from their own page, which kept the study information from appearing on their personal pages (Bull et al., 2011).

## Intervention

The intervention was conducted online with monitoring by a systems analyst and the research team. The *intervention group* participants were asked to review five 60-second intervention videos, weekly. The content was informed by findings from a formative project with young BMSM regarding barriers and challenges to, and recommendations for, motivating HIV testing uptake among young BMSM. Each video’s scene included young BMSM character actors/peers delivering the content: (Video 1) the content focused on HIV prevention knowledge, risk behaviors and practices, including substance abuse and risky sex practices; (Video 2) the content focused on behavioral beliefs, the benefits of HIV testing and early detection, and treatment available for a person living with HIV; (Video 3) the content focused on self-regulation, the importance knowing HIV risks, the influence of peer-support for testing uptake; (Video 4) the content focused on coping with HIV disclosure to friends and family, and the importance of social support for HIV prevention or HIV treatment and management; and (Video 5) the content focused on engagement in self-management, and testing facilities. At the end of each video clip, participants were asked to post comments on the group page in reaction or response to the video content about HIV prevention and HIV testing uptake messages. A staff member monitored the discussion/responses daily to remove incorrect and inappropriate messages.

Participants in the *control group* viewed standard HIV text information. Control participants received the information weekly. The content focused on the following: (Week 1) HIV prevention knowledge; (Week 2) sexually transmitted infections; (Week 3) drug use and sexual risk behavior; (Week 4) the importance of social support for HIV testing and HIV related stigma; (Week 5) what to expect at HIV testing facilities. As part of the Health information group (control) on Facebook, participants were asked to post comments on the group page in reaction or response to the content about HIV prevention messages. A staff member monitored the discussion/responses daily to remove incorrect and inappropriate messages.

All participants received daily updates via email about the study. Participants also received a reminder message 6 weeks following the initial enrollment to complete the follow-up assessment survey, including questions regarding HIV testing uptake and behavior. Project staff conducted follow-up calls to participants who provided a phone number agreeing for telephone contact regarding the follow-up survey. Only the participants who had not completed the follow-up survey within 7 days of receiving the reminder message on Facebook were contacted. The Facebook/TIM Project web page included the location of free HIV testing sites in Los Angeles and Orange County. Participants received a \$20 gift card for the initial survey and intervention part of the study and a \$25 gift card for the 6-week follow-up survey.

Additionally, the names of participants who completed the study was entered into a drawing for a chance to receive an Apple iPad.

## Data Collection

The study was accessed from Facebook.com/TIM Project. The traffic was managed using a simple computer with a GSM modem attached for programmed e-mail delivery, a LimeSurvey account, a project secure website, and a registered Facebook account with a private space. Facebook allows the host to set security settings, and manage access criteria. The computer modem received the prompt once a participant accessed the link sent to their Facebook e-mail account. Then the modem sent the prompt to the computer and a custom script parsed the consent form, returned the link for the survey to the participant who consented, logged the activity and waited for the next prompt. A “LAMP” web server with a database backend was running the survey, which was hosted by LimeSurvey. The survey data were managed solely on LimeSurvey and was not accessible on Facebook for security and confidentiality measures. Streaming video was used for the multimedia intervention, and a commercial web host was used for streaming the video. The systems analyst managed the programming and development effort for the automated delivery as the system had to be verified on more than one device. For the 6-week follow-up survey, a script was run daily, checked the logs, and checked to see if the recipient completed the survey, and if not, then an automated message was sent as a reminder.

## Assessment

Baseline assessment of demographics and screening for HIV testing history were completed. Data collection for the dependent variable was HIV testing history and occurred at baseline and again at follow-up. Participants were asked, “Have you had an HIV test in the past six months?” Response options were “no” and “yes.” Responses were dichotomized to indicate whether a respondent was untested within the past 6 months. To further assess the consistency of HIV testing history, participants were also asked, “In the past six months, how many times have you been tested for HIV?”

There were eight demographic variables included. Age was self-reported continuous-level variable. Level of education was a categorical variable and the response options were less than high school, high school/general educational development (GED), some college, or more. Employment status was categorized as “full-time/part-time employment” and “no employment.” Lastly, the recruitment venue variable was measured using two categories: “online” or “community agency/event.”

The survey also included items assessing the frequency of two types of sexual practices (condomless insertive anal sex, condomless receptive anal sex) during the past 3 months. Response options were “yes” and “no.” HIV knowledge was measured using 14 questions; for example, “HIV can be transmitted through the saliva of an infected person?” and “People must be sexually promiscuous in order to get infected with HIV?” Response options were “true,” “false,” and “don’t know.” One point was assigned for each accurate response with don’t know scored as inaccurate. The responses were coded as 1 for a correct response and 0 for an incorrect or don’t know response. Overall scores could range from 0 to 14, with 14 being high HIV-related knowledge. The HIV knowledge scale was developed by a team

of renowned researchers with expertise in HIV/AIDS prevention interventions and research, and test–retest reliability are reported elsewhere (Aarø et al., 2011).

Drug using behavior was measured using a four-part item. First, participants were asked, “During the last 3 months, have you consumed drugs that were not prescribed by a doctor? Response options were “yes” and “no.” Participants who responded “yes” were asked, “Please indicate which ones.” Response options were marijuana, crack, crystal meth, cocaine, poppers, heroin, ecstasy, ketamine, GHB, Viagra/Cialis, and other. The remaining two questions asked about problems from drugs use, and risk for acquiring or transmitting HIV because of drug use, during the last 3 months. The “drug use risky sex” variable was measured using the following question: “During the last three months, were you at risk for acquiring or transmitting HIV because of your drug use (e.g., sex without a condom using drugs that were not prescribed by a doctor before or during sex)?” The response options were “yes” and “no.” Similarly, for the “alcohol use risky sex” variable, participants were asked, “During the last three months, were you at risk for acquiring or transmitting HIV because of your alcohol use (e.g., sex without a condom using alcoholic beverages, such as beer, wine, liquor before or during sex)?” The response options were “yes” and “no.” Furthermore, participants were asked questions about the use of the following to seek sex during the last 3 months: “Internet to look for sex,” “sex phone lines,” and “public place (e.g., sex clubs, parks, bookstores, porn stores).” Response options were “yes” and “no.”

### Statistical Analyses

To determine the effectiveness of randomization, we compared the demographic characteristics based on the random group assignments using *t* test for continuous variables or chi-square for dichotomous variables. Considering power ( $1-\beta$ ) set at .80 and  $\alpha = .05$ , and the effect size of 0.205 by using GPower software (Faul, Erdfelder, Buchner, & Lang, 2009), we estimated the total sample size would be at least 40.

The primary outcome was change in self-report HIV testing history at follow-up. Because all participants were screened based on HIV testing history in the past 6 months, chi-square tests were performed to determine whether there was significant difference for testing history at follow-up between those in the intervention and control groups. Furthermore, logistic regression was used to examine the HIV testing outcome. A repeated measures analysis of variance (ANOVA) was conducted to compare the effect of the online HIV prevention knowledge component of the intervention on participants’ HIV knowledge at baseline and 6 weeks later. The *p* value < .05 was considered statistically significant. All analyses were performed using the statistical package PASW Statistics Version 22 (SPSS).

## RESULTS

Fifty-six participants were enrolled in the study ( $n = 28$  randomized in the intervention group and  $n = 28$  in the control group). Because 14 did not complete the follow-up, only 42 participants are in the final reporting. Attrition was similar for both groups ( $n = 8$  intervention,  $n = 6$  control). At baseline, the control and intervention group were comparable in all demographic characteristics and baseline HIV knowledge (Table 1).



**TABLE 1. Sample Characteristics, Pretest/Posttest Measure of HIV Knowledge, and Posttest Only Self-Report HIV Test**

	Total N = 42 N (%) or M	Intervention		Control		<i>p</i>
		N	% or M (SD)	N	% or M (SD)	
Age	23.1 (3.4)	20	23.2 (3.4)	22	22.9 (3.3)	.23
Education						
Less than HS	12 (29)	6	30	6	27	.95
HS grad or GED	22 (52)	10	50	12	55	
Some or more college	8 (19)	4	20	4	18	
Employment						
No employment	12 (29)	6	30	6	27	.55
PT or FT employment	30 (71)	14	70	16	73	
Recruitment type						
Online	9 (21)	4	20	5	23	.56
Community agency	33 (79)	16	80	17	77	
Insertive condomless sex <sup>a</sup>						
Yes	14 (33)	6	30	8	36	.75
No	28 (67)	14	70	14	64	
Receptive condomless sex <sup>a</sup>						
Yes	15 (36)	6	30	9	41	.53
No	27 (64)	14	70	13	59	
Drug use HIV risk <sup>a</sup>						
Yes	23 (55)	11	55	12	54	.89
No	19 (45)	9	54	10	46	
Alcohol use HIV risk <sup>a</sup>						
Yes	25 (60)	14	70	11	50	.22
No	17 (40)	6	30	11	50	
Self-report HIV testing at 6-week follow-up						
No	18 (43)	4	20	14	64	.01*
Yes	24 (57)	16	80	8	36	

Note. HS = high school; GED = general educational development; PT = part-time; FT = full-time.

<sup>a</sup>Past 3 months.

\**p* < .01.

**TABLE 2. Outcome at 6-Week Follow-Up (HIV Testing Self-Report)**

Variable	OR	95% CI	<i>p</i>
Condition			
Control	1.00	Reference	
Intervention	7.00	[1.72, 28.33]	.006

Briefly, as shown in Table 1, participants were aged 18–30 years ( $M = 23$  years,  $SD = 3.4$  years). Majority of the participants (52%) had a high school diploma or GED, 29% had less than high school education, and 8% had some college or more. Majority of the participants (71%) had part-time or full-time employment, and 29% were not employed. Of participants, 79% were recruited through a community agency and 21% were recruited through online advertisements. Sixty-seven percent of participants reported no insertive condomless anal sex, and 33% reported having had insertive condomless anal sex in the past 3 months. As for receptive condomless sex, 64% reported none, and 36% reported having had receptive condomless anal sex in the past 3 months. Fifty-five percent of participants reported HIV risk due to drug use, and 45% reported no risk due to drug use. Majority of the participants (60%) reported HIV risk due to alcohol use before or during sex, and 40% reported no risk.

Table 2 shows the primary outcome, self-report HIV testing. At screening and baseline, all participants reported not having tested for HIV in the last 6 months. Participants were asked about HIV testing again at 6-week follow-up. Logistic regression revealed that the intervention group had a 7 times greater odds of testing for HIV at 6-week follow-up than those in the control group (odds ratio [OR] = 7.00, 95% confidence interval [1.72, 28.33],  $p = .006$ ). A secondary outcome was HIV testing knowledge. HIV testing knowledge was measured at baseline and 6 weeks follow-up for both the control and intervention groups. As shown in Table 3, the repeated measures ANOVA with Greenhouse-Geisser correction determined that the effect of the online HIV testing intervention was significantly different between time

**TABLE 3. Source Table for 2 (Baseline and 6-Week Follow-Up)  $\times$  2 (Intervention-Control) Within Subjects, Within-Between Subject Analysis of Variance of the Study**

Sources	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig <sup>a</sup>
HIV knowledge	7.093	1	7.093	68.44	.001
HIV Know $\times$ Group	0.997	1	0.997	9.62	.004
Error (knowledge)	4.145	40	0.104		
Between group (know)	0.997	1	0.997	9.62	.004

<sup>a</sup>Calculated based on Greenhouse-Geisser correction.

points,  $F(1, 40) = 68.44$ ,  $p = .001$ . There was a significant interaction between the intervention group and time (baseline/follow-up),  $F(1, 40) = 9.62$ ,  $p = .004$ . This effect indicated that the increase in HIV knowledge significantly differed in the intervention as compared to the control group.

## DISCUSSION

We evaluated the feasibility of implementing a video intervention to motivate HIV testing uptake among BMSM using Facebook. The intervention is distinct as the content was informed by, and focused explicitly on, young BMSM. Given the disproportionate representation of new HIV infections among young BMSM, and the high rate of those who are unaware of their infection, having a culturally-centered intervention to motivate HIV testing uptake tailored for this group is a high priority. Our intervention using short video clips delivered a social media platform was tested because such an intervention is cost-effective and useful for engaging young BMSM. Overall our findings suggest that the video-based intervention delivered using Facebook with chat features is feasible provided that it (1) includes short clips about HIV prevention knowledge and the importance of HIV testing uptake for BMSM, (2) share stories from and images of young BMSM, and (3) is available for use in community-based agencies who serve high-risk young BMSM. As previously mentioned, majority of the participants who used the internet for screening were not eligible because of the strict HIV testing history criterion. The in-person recruitment efforts at community-based agencies, particularly substance abuse treatment agencies, were more yielding than the online recruitment. The video intervention was feasible for motivating HIV testing uptake among a high-risk population. The fact that there were small to moderate effect sizes in favor of the intervention in the selected outcome measures indicates that this HIV testing intervention may be promising. This small feasibility pilot study was not expected to show significance because of low power.

Our study suggests that social media platforms such as Facebook may be an effective tool in increasing BMSM's HIV knowledge and HIV testing. This has important implications to the delivery of messaging using wireless technology to young men overall and particularly BMSM to improve health. Our study found that the participants who dropped out of the study and did not complete the intervention, we were unable to reach them because their phones were out of service. Recent literature on the digital divide shows that Black young adults access the Internet primarily through the use of smart phones. The demographics of our sample are similar to those who are negatively impacted by the digital divide, young BMSM who are low income and possess relatively low education attainment. Future studies should take the digital divide and type of devices used to access health information and delivery into consideration ("Who Are Smartphone Users?" 2012).

Similar to other programs and studies including social media to improve health (Blas et al., 2007; Chiasson et al., 2010; Kline et al., 2001; Cornelius et al., 2011; Holt et al., 2011; Klein et al., 2010; Levine et al., in press; Rosser et al., 2011; Tsirulink, 2008; Washington & Thomas, 2010; Whittaker et al., 2011; Wilkerson et al., 2011; Wright et al., 2011; Ybarra & Bull, 2007), our findings indicated that multimedia is a feasible method to deliver a health intervention. Furthermore, con-

sistent with previous research (Caetano & Clark, 1998; Stephenson et al., 2008; Warner et al., 2008), our findings provide evidence that online video-based interventions are useful for providing HIV prevention knowledge and knowledge about the importance of testing. At the same time, our findings suggest that in an effort to engage high-risk young BMSM in interventions using technology and social media platforms must not rely only on social media platforms for outreach. It is important to have technology available in community agencies who serve high-risk young BMSM. Those young BMSM who are untested or infrequently test for HIV (every 3–6 months) may not frequent or yield to social media sites seeking HIV education. However, the use of social media to deliver short video clips with chat features in a community agency or treatment setting can be engaging and effective for motivating HIV testing uptake. Having this available in agencies may be helpful for providers who are busy, or do not have time to provide, or participate in lengthy interventions.

The increase in the use of social media platforms offer an opportunity for HIV prevention service providers and researchers to actively engage young BMSM, increase testing uptake among this population, increase their engagement in their own care, connect with other young BMSM on health-related issues (i.e., HIV testing, PrEP use), and to address health disparities issues among this population such as access, quality, and stigma. However, additional research and practice among clinicians and service providers must address the health disparities within the context of social media platforms as a matter of social justice. While racial/ethnic minorities, such as BMSM use their cell phones to access the Internet and health information, young BMSM may not be able to access the Internet because of the costs of cell phones and phone plans. Therefore, future research should address the use of multimodalities of social media to interact and provide health information such as HIV testing (i.e., texting, SnapChat/Periscope videos, Podcast).

Social media platforms present a unique opportunity for HIV researchers and practitioners to address other social justice issues such as health literacy, which is a major issue with providing health promotion information. Health literacy is a major deterrent to health promotion information, both face to face and online. The expansive use of social media such as the video clips we designed for providing HIV prevention information such as testing, allows BMSM to receive information that is accessible to them, and removes the hindrance of health literacy problems. Research shows that 43% of U.S. adults had basic or below health literacy skills, and typical health materials are written at levels that surpass the average high school students reading skills (CDC, 2017). This results in participants knowing less about their health problems and less engagement in preventive health practices. Future research on social media platforms for health information and interventions should acknowledge and incorporate measures to address health literacy issues, especially among BMSM, who are more likely to have these problems.

Because of its omnipresence, social media platforms like Facebook present health researchers with a real chance to finally address and decrease health disparities. Moreover, by addressing social justice issues such as access, health literacy, and quality, we may be able to make some real strides in the effort to increase HIV testing among BMSM and decrease those who become infected.

Limitations of this study include the small sample and attrition in both groups. In addition, the majority of the sample was recruited at a substance abuse community agency in Los Angeles County and cannot be generalized to other recruitment

settings. Also, the findings cannot be generalized to the young BMSM who may not frequent community agencies. Further research is needed in a larger population to further assess to what extent our findings are replicated. Despite these limitations, the findings have implications for health professionals aiming to impact the HIV/AIDS health disparity that exists among young BMSM. An intervention that is informed by, and explicitly tailored for, young BMSM, to increase HIV testing is an important contribution. The intervention may be sustained through, and adopted by, community organizations and institutions with websites oriented to motivate HIV testing among BMSM and similar populations at high risk for HIV.

We did not ask about HIV status at follow-up. Future research should consider providing an HIV testing home kit or partner with an HIV testing unit to assess HIV testing uptake. Retention rates were adequate for both the intervention and control groups, 71% and 78%, respectively. Nonetheless, it is important to improve retention. We were not able to assess reasons for those who did not complete the study. Future research should assess specific barriers to retention. Having that information would be helpful for addressing retention for retaining high-risk young BMSM.

## REFERENCES

- Aarø, L. E., Breivik, K., Klepp, K. I., Kaaya, S., Onya, H. E., Wubs, A., . . . Flisher, A. J. (2011). An HIV/AIDS knowledge scale for adolescents: Item response theory analyses based on data from a study in South Africa and Tanzania. *Health Education Research, 26*(2), 212–224. <http://dx.doi.org/10.1093/her/cyq086>
- Blas, M. M., Alva, I. E., Cabello, R., Garcia, P. J., Carcamo, C., Redmon, M., . . . Kurth, A. E. (2007). Internet as a tool to access high-risk men who have sex with men from a resource-constrained setting: A study from Peru. *Sexually Transmitted Infections, 83*(7), 567–570. <http://dx.doi.org/10.1136/sti.2007.027276>
- Bull, S. S., Breslin, L. T., Wright, E. E., Black, S. R., Levine, D., & Santelli, J. S. (2011). Case study: An ethics case study of HIV prevention research on Facebook: The Just/Us Study. *Journal of Pediatric Psychology, 36*, 1082–1092. <http://dx.doi.org/10.1093/jpepsy/jsq126>
- Bull, S. S., Levine, D. K., Black, S. R., Schmiege, S. J., & Santelli, J. (2012). Social media–delivered sexual health intervention: A cluster randomized controlled trial. *American Journal of Preventive Medicine, 43*(5), 467–474. <http://dx.doi.org/10.1016/j.amepre.2012.07.022>
- Caetano, R., & Clark, C. L. (1998). Trends in alcohol consumption patterns among whites, blacks and Hispanics: 1984 and 1995. *Journal of Studies on Alcohol and Drugs, 59*(6), 659–668.
- Caetano, R., Clark, C. L., & Tam, T. (1998). Alcohol consumption among racial/ethnic minorities. *Alcohol Health and Research World, 22*(4), 233–241.
- Campsmith, M. L., Rhodes, P. H., Hall, H. I., & Green, T. A. (2010). Undiagnosed HIV prevalence among adults and adolescents in the United States at the end of 2006. *Journal of Acquired Immune Deficiency Syndromes, 53*(5), 619–624. <http://dx.doi.org/10.1097/QAI.0b013e3181bf1c45>
- Castilla, J., Del Romero, J., Hernando, V., Marincovich, B., Garcia, S., & Rodriguez, C. (2005). Effectiveness of highly active antiretroviral therapy in reducing heterosexual transmission of HIV. *Journal of Acquired Immune Deficiency Syndromes, 40*(1), 96–101.
- Centers for Disease Control and Prevention. (2009a). HIV infection among injection-drug users—34 states, 2004–2007. *Morbidity and Mortality Weekly Report, 58*(46), 1291–1295.
- Centers for Disease Control and Prevention. (2009b). *Racial and Ethnic Approaches to Community Health (REACH U.S.). Finding solutions to health disparities*. Retrieved from <https://www.cdc.gov/nccdphp/dnpao/state-local-programs/reach/>

- Centers for Disease Control and Prevention. (2010a). *HIV surveillance report, 2008*. Vol. 20. Atlanta, GA: Author.
- Centers for Disease Control and Prevention. (2010b). Prevalence and awareness of HIV infection among men who have sex with men—21 cities, United States, 2008. *Morbidity and Mortality Weekly Report*, 59, 1201–1207.
- Centers for Disease Control and Prevention. (2010c). *Trends in reportable sexually transmitted diseases in the United States: 2009 National surveillance data on chlamydia, gonorrhea, and syphilis*. Retrieved from <http://www.cdc.gov/std/stats09/trends2009.pdf>
- Centers for Disease Control and Prevention. (2011). *HIV surveillance report, 2009*. Atlanta, GA: Author.
- Centers for Disease Control and Prevention. (2015). *HIV among Black/African American gay, bisexual, & other men who have sex with men*. Atlanta, GA: Author.
- Centers for Disease Control and Prevention. (2017). *Health literacy basics*. Retrieved from <https://www.cdc.gov/healthliteracy/index.html>
- Chiasson, M. A., Hirshfield, S., & Rietmeijer, C. (2010). HIV prevention and care in the digital age. *Journal Acquired Immune Deficiency Syndrome*, 55(Suppl. 2), S94–S97. <http://dx.doi.org/10.1097/QAI.0b013e3181fcb878>
- Chiasson, M. A., Shaw, F. S., Humberstone, M., Hirshfield, S., & Hartel, D. (2009). Increased HIV disclosure three months after an online video intervention for men who have sex with men (MSM). *AIDS Care*, 21(9), 1081–1089. <http://dx.doi.org/10.1080/09540120902730013>
- Cornelius, J. B., Cato, M., St. Lawrence, J., Boyer, C. B., & Lightfoot, M. (2011). Development and pretesting multimedia HIV-prevention text messages for mobile cell phone delivery. *Journal of the Association of Nurses in AIDS Care*. <http://dx.doi.org/10.1016/j.jana.2010.11.007>
- Erbelding, E. J., & Zenilman, J. M. (2005). Towards better control of sexually transmitted diseases. *New England Journal of Medicine*, 352, 720–721.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160. <http://dx.doi.org/10.3758/BRM.41.4.1149>
- Fenton, K. A. (2007). Changing epidemiology of HIV/AIDS in the United States: Implications for enhancing and promoting HIV testing strategies. *Clinical Infectious Diseases*, 45(Suppl. 4), S213–S220. <http://dx.doi.org/10.1086/522615>
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fishbein, M., Hennessy, M., Kamb, M., Bolan, G., Hoxworth, T., Iatesta, M., . . . Zenilman, J. (2001). Using intervention theory to model factors influencing behavior change. *Evaluation & the Health Professions*, 24(4), 363–384.
- Gilbert, L. K., Levandowski, B. A., Scanlon, K. E., & Peterson, R. S. (2010). A comparison of hepatitis A and hepatitis B measures among vaccinated and susceptible online men who have sex with men. *International Journal of STD & AIDS*, 21(6), 400–405. <http://dx.doi.org/10.1258/ijsa.2009.009010>
- Grimley, D. M., & Hook, E. W. (2009). A 15 minute interactive, computerized condom use intervention with biological endpoints. *Sexually Transmitted Diseases*, 36(2), 73–78.
- Holt, M., Rawstorne, P., Wilkinson, J., Worth, H., Bittman, M., & Kippax, S. (2011). HIV testing, gay community involvement and internet USE: Social and behavioural correlates of HIV testing among Australian men who have sex with men. *AIDS and Behavior*, 16, 13–22. <http://dx.doi.org/10.1007/s10461-010-9872-z>
- Hunter, P., Oyervides, O., Grande, K. M., Prater, D., Vann, V., Reitl, I., & Biedrzycki, P. A. (2014). Facebook-augmented partner notification in a cluster of syphilis cases in Milwaukee. *Public Health Reports*, 129, 43–49.

- Kitahata, M. M., Gange, S. J., Abraham, A. G., Merriman, B., Saag, M. S., Justice, A. C., . . . Moore, R. D. (2009). Effect of early versus deferred antiretroviral therapy for HIV on survival. *New England Journal of Medicine*, *360*(18), 1815–1826. <http://dx.doi.org/10.1056/NEJMoa0807252>
- Klein, H., Lambing, T. P., Moskowitz, D. A., Washington, T. A., & Gilbert, L. K. (2010). Recommendations for performing Internet-based research on sensitive subject matter with “hidden” or difficult-to-reach populations. *Journal of Gay & Lesbian Social Services*, *22*(4), 371–398. <http://dx.doi.org/10.1080/10538720.2010.491742>
- Kline, M. W., Boyle, R. J., Futterman, D., Havens, P. L., King, S., . . . Whitley-Williams, P. N. (2001). Adolescents and human immunodeficiency virus infection: The role of the pediatrician in prevention and intervention. *Pediatrics*, *107*, 188–190.
- Levine, D., Madsen, A., Barar, R., Wright, E., & Bull, S. (in press). Asynchronous focus groups on MySpace: Creating cultural and environmental relevance for hard to reach populations. *Journal of Health Communication*.
- Lorenc, T., Marrero-Guillamon, I., Aggleton, P., Cooper, C., Llewellyn, A., Lehmann, A., & Lindsay, C. (2011). Promoting the uptake of HIV testing among men who have sex with men: systematic review of effectiveness and cost-effectiveness. *Sexually Transmitted Infections*, *87*(4), 272–278. <http://dx.doi.org/10.1136/sti.2010.048280>
- Mikolajczak, J., Hospers, H. J., & Kok, G. (2006). Reasons for not taking an HIV-test among untested men who have sex with men: An Internet study. *AIDS and Behavior*, *10*(4), 431–435. <http://dx.doi.org/10.1007/s10461-006-9068-8>
- Millet, G. A., Peterson, J. L., Wolitski, R. J., & Stall, R. (2006). Greater risk for HIV infection of Black men who have sex with men: A critical literature review. *American Journal of Public Health*, *96*(6), 1008–1019.
- Myint, U. A., Bull, S., Greenwood, G. L., Patterson, J., Rietmeijer, C. A., Vrungos, S., . . . O'Donnell, L. N. (2010). Safe in the city: Developing an effective video-based intervention for STD clinic waiting rooms. *Health Promotion Practice*, *11*(3), 408–417. <http://dx.doi.org/10.1177/1524839908318830>
- Newman, P. A., & Zimmerman, M. A. (2000). Gender differences in HIV-related sexual behavior among urban African-American youth: A multivariate approach. *AIDS Education and Prevention*, *12*, 308–325.
- Pérez-Figueroa, R. E., Kapadia, F., Barton, S. C., Eddy, J. A., & Halkitis, P. N. (2015). Acceptability of PrEP uptake among racially/ethnically diverse young men who have sex with men: The P18 study. *AIDS Education & Prevention*, *27*(2), 112–125. <http://dx.doi.org/10.1521/aeap.2015.27.2.112>
- Phillips, K. A., Paul, J., Kegeles, S., Stall, R., Hoff, C., & Coates, T. J. (1995). Predictors of repeat HIV testing among gay and bisexual men. *AIDS*, *9*(7), 769–775.
- Porco, T. C., Martin, J. N., Page-Shafer, K. A., Cheng, A., Charlebois, E., Grant, R. M., & Osmond, D. H. (2004). Decline in HIV infectivity following the introduction of highly active antiretroviral therapy. *AIDS*, *18*(1), 81–88.
- Prejean, J., Song, R., Hernandez, A., Ziebell, R., Green, T., Walker, F., . . . Hall, I. (2011). Estimated HIV incidence in the United States, 2006–2009. *PLoS ONE*, *6*(8), e17502. <http://dx.doi.org/10.1371/journal.pone.0017502>
- Quinn, T. C., Wawer, M. J., Sewankambo, N., Serwadda, D., Li, C., Wabwire-Mangen, F., . . . Gray, R. H. (2000). Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group. *New England Journal of Medicine*, *342*(13), 921–929. <http://dx.doi.org/10.1056/NEJM200003303421303>
- Reynolds, S., Makumbi, F., & Kayaagi, J. (2009, February). *ART reduced the rate of sexual transmission of HIV in HIV-discordant couples in rural Rakai, Uganda*. Paper presented at the 16th Conference on Retroviruses and Opportunistic Infections, Montreal, Quebec.

- Rhodes, F., & Malotte, C. K. (1996). HIV risk interventions for active drug users: Experience and prospects. In S. Oskamp & S. Thompson (Eds.), *Understanding and preventing HIV risk behavior: Safer sex and drug use* (pp. 207–236). Thousand Oaks, CA: Sage.
- Rhodes, S. D., Hergenrather, K. C., Duncan, J., Vissman, A. T., Miller, C., Wilkin, A. M., . . . Eng, E. (2010). A pilot intervention utilizing Internet chat rooms to prevent HIV risk behaviors among men who have sex with men. *Public Health Reports*, *125*, 29–37.
- Rhodes, S. D., Vissman, A. T., Stowers, J., Miller, C., McCoy, T. P., Hergenrather, K. C., . . . Eng, E. (2011). A CBPR partnership increases HIV testing among men who have sex with men (MSM): Outcome findings from a pilot test of the CyBER/testing Internet intervention. *Health Educ Behav*. <http://dx.doi.org/10.1177/1090198110379572>
- Robbins, G. K., Spritzler, J. G., Chan, E. S., Asmuth, D. M., Gandhi, R. T., Rodriguez, B. A., . . . Pollard, R. B. (2009). Incomplete reconstitution of T cell subsets on combination antiretroviral therapy in the AIDS Clinical Trials Group Protocol 384. *Clinical Infectious Diseases*, *48*(3), 350–361. <http://dx.doi.org/10.1086/595888>
- Rosser, B. R., Wilkerson, J. M., Smolenski, D. J., Oakes, J. M., Konstan, J., Horvath, K. J., . . . Morgan, R. (2011). The future of Internet-based HIV prevention: A report on key findings from the Men's INternet (MINTS-I, II) Sex Studies. *AIDS and Behavior*, *15*(Suppl. 1), S91–100. <http://dx.doi.org/10.1007/s10461-011-9910-5>
- Stephenson, R., Mendenhall, E., Muzizi, L., Vwalika, B., Chomba, E., Ahmed, Y., . . . Allen, S. (2008). The influence of motivational messages on future planning behaviors among HIV concordant positive and discordant couples in Lusaka, Zambia. *AIDS Care*, *20*(2), 150–160. <http://dx.doi.org/10.1080/09540120701534681>
- Sullivan, P., Kayitenkore, K., Chomba, E., Karita, E., Mwananyanda, L., Vwalika, C., . . . Allen, S. (2010). Reduction of HIV transmission risk while prescribed antiretroviral therapy (ARVT): Misclassification of ARVT status as a methodological issue. *Aids Research and Human Retroviruses*, *26*(10), A19–A19.
- Tsirulink, G. (2008). *1 Trillion text messages sent in 2008*. Retrieved from <http://www.mobilemarketer.com/cms/trackback/2969-1>
- Vial, A. C., Starks, T. J., & Parsons, J. T. (2014). Finding and recruiting the highest risk HIV-negative men who have sex with men. *AIDS Education & Prevention*, *26*(1), 56–67. <http://dx.doi.org/10.1521/aeap.2014.26.1.56>
- Warner, L., Klausner, J. D., Rietmeijer, C. A., Malotte, C. K., O'Donnell, L., Margolis, A. D., . . . Borkowf, C. B. (2008). Effect of a brief video intervention on incident infection among patients attending sexually transmitted disease clinics. *PLoS Medicine*, *5*(6), 919–927.
- Washington, T. A., Galai, N., Cohn, S., Celentano, D. D., Vlahov, D., & Strathdee, S. A. (2006). The relationship between self-reported sexual orientation and behavior in a sample of middle-aged male injection drug users. *Archives of Sexual Behavior*, *35*(1), 67–74. <http://dx.doi.org/10.1007/s10508-006-8995-9>
- Washington, T. A., Patel, S., & Meyer-Adams, N. (2015). Drinking patterns and HIV risk behaviors among Black and Latino men who have sex with men in Los Angeles County. *American Journal of Men's Health*. Advance online publication. <http://dx.doi.org/10.1177/1557988315605894>
- Washington, T. A., Robles, G., & Malotte, C. K. (2013). Factors associated with HIV-testing history among Black men who have sex with men in Los Angeles County. *Behavioral Medicine*, *39*, 52–59.
- Washington, T. A., & Thomas, C. (2010). Exploring the use of web-based HIV prevention for injection-drug-using black men who have sex with both men and women: A feasibility study. *Journal of Gay & Lesbian Social Services*, *22*(4), 432–445.
- Whittaker, R., Dorey, E., Bramley, D., Bullen, C., Denny, S., Elley, C. R., . . . Salmon, P. (2011). A theory-based video messaging mobile phone intervention for smoking cessation: randomized controlled trial. *Journal of Medical Internet Research*, *13*(1), e10. <http://dx.doi.org/10.2196/jmir.1553>



- Whittaker, R., Maddison, R., McRobbie, H., Bullen, C., Denny, S., Dorey, E., . . . Rodgers, A. (2008). A multimedia mobile phone-based youth smoking cessation intervention: Findings from content development and piloting studies. *Journal of Medical Internet Research*, *10*(5), e49. <http://dx.doi.org/10.2196/jmir.1007>
- Who Are Smartphone Users? (2012). *Library Technology Reports*, *48*(1), 5–8.
- Wilkerson, J. M., Danilenko, G. P., Smolenski, D. J., Myer, B. B., & Rosser, B. R. (2011). The role of critical self-reflection of assumptions in an online HIV intervention for men who have sex with men. *AIDS Educ Prev*, *23*(1), 13–24. <http://dx.doi.org/10.1521/aeap.2011.23.1.13>
- Wright, E., Fortune, T., Juzang, I., & Bull, S. (2011). Text messaging for HIV prevention with young Black men: Formative research and campaign development. *AIDS Care*, 1–8. <http://dx.doi.org/10.1080/09540121.2010.524190>
- Ybarra, M. L., & Bull, S. S. (2007). Current trends in Internet- and cell phone-based HIV prevention and intervention programs. *Current HIV/AIDS Reports*, *4*(4), 201–207.
- Young, S. D., Dutta, D., & Dommety, G. (2009). Extrapolating psychological insights from Facebook profiles: A study of religion and relationship status. *CyberPsychology & Behavior*, *12*(3), 347–350. <http://dx.doi.org/10.1089/cpb.2008.0165>
- Young, S. D., Holloway, I., Jaganath, D., Rice, E., Westmoreland, D., & Coates, T. (2014). Project HOPE: Online social network changes in an HIV prevention randomized controlled trial for African American and Latino men who have sex with men. *American Journal of Public Health*, *104*(9), 1707–1712. <http://dx.doi.org/10.2105/ajph.2014.301992>
- Young, S. D., & Jordan, A. H. (2013). The Influence of social networking photos on social norms and sexual health behaviors. *CyberPsychology, Behavior & Social Networking*, *16*(4), 243–247. <http://dx.doi.org/10.1089/cyber.2012.0080>
- Young, S. D., Shakiba, A., Kwok, J., & Montazeri, M. S. (2014). The influence of social networking technologies on female religious veil-wearing behavior in Iran. *CyberPsychology, Behavior & Social Networking*, *17*(5), 317–321. <http://dx.doi.org/10.1089/cyber.2013.0338>

**Acknowledgments.** The research reported in this publication was supported by the National Institute on Drug Abuse under Award Number 1R21DA033874-01A1, an institute of the National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. A special thanks to Stella Corrales for her administrative support during the duration of the project.

Correspondence regarding this article should be directed to Thomas Alex Washington, PhD, California State University, Long Beach, 1250 N. Bellflower Blvd., SPA 224, Long Beach, CA 90840. E-mail: alex.washington@cslb.edu