

## **Brothers leading healthy lives: outcomes from the pilot testing of a culturally and contextually congruent HIV prevention intervention for black male college students**

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### **Abstract:**

We used a treatment group-only design to pilot test a newly developed intervention to increase condom use among higher risk heterosexually active African American/black male college students. A community-based participatory research partnership developed the intervention called Brothers Leading Healthy Lives. Following an initial screening of 245 men, 81 eligible men were contacted for participation. Of the 64 men who agreed to participate, 57 completed the intervention and 54 of those completed the 3-month follow-up assessment, for a 93% completion rate. Results show significant changes between the baseline and 3-month follow-up assessments in behavioral outcomes, including reductions in unprotected sex, increase in protection during last intercourse, and fewer condom use errors. Most potential mediators (knowledge, attitudes, intentions, and condom use self-efficacy) also changed significantly in the expected direction. These demonstrated changes provide good evidence that men exposed to this intervention will see changes that reduce their risk for HIV.

**Keywords:** HIV infections -- prevention | Action research | Analysis of variance | Behavior modification | Blacks | College students | Condoms | Probability theory | Questionnaires | Research -- Finance | Industrial research | Self-efficacy | Pilot projects | Safe sex | Harm reduction (Human behavior) | Pre-tests & post-tests | Repeated measure design | Descriptive statistics

\*\*\*Note: Full text of article below

## **BROTHERS LEADING HEALTHY LIVES: OUTCOMES FROM THE PILOT TESTING OF A CULTURALLY AND CONTEXTUALLY CONGRUENT HIV PREVENTION INTERVENTION FOR BLACK MALE COLLEGE STUDENTS**

Robert E. Aronson, Kelly L. Rulison, Louis F. Graham, Regina McCoy Pulliam, Warner L. McGee, Jeffrey D. Labban, Deirdre Dingman, and Scott D. Rhodes

We used a treatment group–only design to pilot test a newly developed intervention to increase condom use among higher risk heterosexually active African American/black male college students. A community-based participatory research partnership developed the intervention called *Brothers Leading Healthy Lives*. Following an initial screening of 245 men, 81 eligible men were contacted for participation. Of the 64 men who agreed to participate, 57 completed the intervention and 54 of those completed the 3-month follow-up assessment, for a 93% completion rate. Results show significant changes between the baseline and 3-month follow-up assessments in behavioral outcomes, including reductions in unprotected sex, increase in protection during last intercourse, and fewer condom use errors. Most potential mediators (knowledge, attitudes, intentions, and condom use self-efficacy) also changed significantly in the expected direction. These demonstrated changes provide good evidence that men exposed to this intervention will see changes that reduce their risk for HIV.

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HIV disproportionately burdens African American/black communities in the United States, with men experiencing the highest rates of infection. The most recent data from the HIV Surveillance Report, 2010 (Centers for Disease Control and Prevention, 2012) show that although accounting for only 13% of the population in 2010, African Americans/blacks accounted for 46% of all HIV diagnoses in the 46 states having confidential name-based reporting. Among those who are African American/black and diagnosed with HIV, more than 70% are males. Although an estimated 70% of new HIV cases among African American/black males are attributed to men who have sex with men (MSM), nearly 20% of new cases are attributed to heterosexual contact (Centers for Disease Control and Prevention, 2012). The southern part of the United States has the most people living with HIV/AIDS and the fastest growing epidemic in the nation compared to other regions (Southern AIDS Coalition, 2012). Of the 10 states with the highest rates of HIV infection, 8 are in the South, including North Carolina (NC).

The age range with the largest percentage of new diagnoses and highest rate of HIV infection is 20–24 years. For 2010, the Centers for Disease Control (CDC) reported that 16% of new diagnoses were for this age range, with a rate of 36.9 per 100,000. The infection rate for African Americans/blacks in this age range was a troubling 148.3 per 100,000 (Centers for Disease Control and Prevention, 2012). Although college students have traditionally been considered a low risk group for HIV, a significant spike in the number of HIV cases was noted among college students in NC (Anonymous, 2004), particularly among African American/black males (Hightow et al., 2005). It is widely suggested that college students may have better access to information about and treatment for HIV and sexually transmitted disease (STD) prevention, but this increased knowledge and access to treatment have not resulted in decreased risk (or rates). This lack of translation from knowledge to prevention is particularly observed among African American/black college students (Adefuye, Abiona, Balogun, & Lukobo-Durrell, 2009).

There is a paucity of effective and efficacious HIV prevention strategies targeting heterosexual black men and particularly college-age men. Traditionally, HIV interventions have been targeted toward MSM, injection drug-users (IDUs), and women (Centers for Disease Control and Prevention, 2009). As the current evidence regarding HIV infection among African American/black college men in NC suggests, more needs to be done to reduce the burden of HIV among African American/black male college students. In response, we developed and pilot-tested a CDC-funded HIV prevention intervention—*Brothers Leading Healthy Lives* (BLHL)—that targeted higher risk heterosexually active African American/black male college students.

HIV risk among black/African American men, and particularly those in college, occurs within multiple ecologic contexts and is influenced by a variety of potential factors. Intrapersonal factors influencing risk include the lack of knowledge about transmission and prevention strategies, and attitudes and beliefs that may not support safer sex (Adefuye et al., 2009; Bajos, 1997). A study by Payne and colleagues (2006) reaffirmed the findings of other studies that many African American/black college students do not use condoms consistently. In some relationship contexts, African American/black men may consider the open discussion and “negotiation” of condom use inappropriate and the use of condoms as sacrificing sensitivity, sensation, and passion and interrupting sexual spontaneity (Peterson, Bakeman, Blackshear, & Stokes, 2003; Whitehead, 1997).

Interpersonal factors influencing risk include the meaning of risk reduction strategies (e.g., abstinence, condom use) within relationships, and implications of efforts

to negotiate protection on levels of trust within relationships (Winfield & Whaley, 2005). For example, requesting either abstinence or condom use could threaten the survival of a relationship, and introducing condom use into a perceived monogamous relationship could be seen as a threat to trust, implying either admission or suspicion of infidelity (Whitehead, 1997). Social networks also may play a role in influencing behavior toward greater risk or greater protection. Upon entering college, students may experience weaker protective controls over behavior. The type of influence exerted by these new college networks varies greatly, with some encouraging student success and social responsibility, and some encouraging pursuits related to pleasure, freedom, non-academic endeavors, and even sexual risk (Muraskin, 1997).

African American/black college men's sex practices and sexual relationships also need to be understood in terms of socio-culturally constructed definitions of masculinity, and men's attempts to negotiate social status and power (Courtenay, 2000). In effect, health behaviors can be understood as a means of striving for ideal masculinity or shaping one's gender as a man. The dominant, or hegemonic, form of masculinity in Western societies represents the idealized man. The major tenets of hegemonic masculinity include avoiding feminine behaviors, displaying dominance and power, portraying independence and stoicism, and demonstrating fearlessness, bravery, and competitiveness (Courtenay, 2000; David & Brannon, 1976; Hong, 2000). These attitudes, beliefs, and resulting behaviors of hegemonic masculinity are often associated with increased morbidity, mortality, and low utilization of health care services. In fact, sexual risk behaviors among men are at least explained partially by male gender socialization (Courtenay, 2000; Hong, 2000; Moynihan, 1998). It has been argued that African American/black men who are economically and socially marginalized in society due to racism, discrimination, and cultural incongruence (Graham, Brown-Jeffy, Aronson, & Stephens, 2011) are more likely to exhibit forms of masculinity that are detrimental to their health because they do not have access to the white male dominant power structure (Courtenay, 2000; Hong, 2000).

The current state of knowledge regarding factors influencing HIV risk among African American/black college students offers potential leverage points for interventions designed to reduce HIV risk behaviors, including taking action to: (a) increase knowledge of HIV/AIDS, effective prevention strategies, and appropriate condom use; (b) address issues of intimate relationships, gender role socialization, masculinity, and racism; (c) build skills in communication, assertiveness, and negotiating condom use; and (d) expand networks of support and accountability for men.

We present results of a pilot test of BLHL, a culturally and contextually congruent HIV prevention intervention for heterosexually active African American/black male college students.

## **METHODS**

### **SETTING**

The research and intervention activities were conducted at the University of North Carolina Greensboro (UNCG) and North Carolina Agricultural and Technical State University (NCA&T). UNCG is a predominantly white institution with a 2012 enrollment of approximately 17,000. Among undergraduates, 35% are male and 25% are African American/black. NCA&T is an historically black university with a 2012 enrollment of ~10,650. Among undergraduates at NCA&T, 45% are male and 84% are African American/black. Both institutions are part of the statewide

UNC system and their campuses are located within three miles of each other. Human subject oversight for the study was provided by the UNCG and Wake Forest School of Medicine Institutional Review Boards (the university affiliations for the principal investigators at the time of this study).

#### DEVELOPING BLHL THROUGH COMMUNITY-BASED PARTICIPATORY RESEARCH

The intervention was designed by a community-based participatory research (CBPR) partnership among African American/black college students, university faculty and staff, and community partners involved in HIV prevention. Principles of CBPR were used throughout all phases of this research project. To start, we developed the proposal as part of a five-year collaboration with a network of African American/black male college students known as “Brother 2 Brother” at UNCG. Students in Brother 2 Brother were concerned about the HIV and STD risk behaviors that they and their friends engaged in, the misconceptions among their peers about who is at risk, and the challenges facing African American/black men as they struggle with asserting their masculinity within the contexts of a predominantly white university and within their social networks.

After the project was funded, we established the Research and Intervention Advisory Team (RIAT), comprised of key African American/black student leaders and representatives from campus organizations from both UNCG and NCA&T, student-focused university services (Student Health Center, Multi-Cultural Affairs, Task Force on African American/Black Male Retention and Graduation), and community-based organizations (local public health departments and AIDS service organizations). Many of the RIAT members had previously worked together on other health-related projects, including small research studies. Anyone could join the RIAT if they had a commitment to the population and health issues under study. An expanded network of student volunteers served on the Student RIAT, which had more frequent and less formal contact with the project staff than the RIAT. Both groups helped design the formative phase and analyze data collected during this phase, and both groups helped to develop the intervention based on the formative phase. Student RIAT members attended meetings conducted by a doctoral-level graduate assistant in which they provided feedback on the intervention curriculum content, materials, and delivery strategies. Five members were trained to assist in the facilitation of intervention components.

#### FORMATIVE RESEARCH

The formative research phase of this project explored the relationship between masculinity and other social, cultural, and psychological factors (potential mediators) with behavioral risks for HIV/AIDS. We explored these relationships through surveys, focus groups, and in-depth qualitative interviews with African American/black heterosexually active male college students. Topics of inquiry included masculinity, sexuality, sexual relationships, communication, sexual risks, and protection, as well as practical issues related to reaching and engaging college men in HIV prevention interventions. The in-depth interviews also explored men’s personal reports of facilitators and barriers to condom use, including condom negotiation.

A detailed description of the formative phase, including findings, is forthcoming (Graham et al., in review). Briefly, our findings suggested that HIV efforts should focus on students who are older, those who live off campus, those who use alcohol and drugs, and those who have primary sexual partners. Formative data also revealed

that multiple factors influence HIV risk, including: how men define sex and sexual risk; relationship challenges to honest dialogue about sex; and the importance of masculine and sexual reputation in a college setting. We drew on these findings as we designed the content of the BLHL intervention.

#### INTERVENTION DEVELOPMENT AND DESIGN

In addition to our formative research, we drew on theoretical considerations and evidence from existing interventions to develop the BLHL intervention. We drew on previous research (Aronson, Whitehead, & Baber, 2003) and formative research with African American/black heterosexually active college males, which suggested that aspects of black masculinity and the imbalance of masculine expression (emphasis on reputational vs. respectability attributes) undermine engagement in protective behaviors. The curriculum also was informed by the Information-Motivation-Behavioral Skills Model (IMB) (Fisher, Fisher, & Harman, 2009) and Whitehead's Big Man Little Man Complex (BM/LMC) (Whitehead, 1992). According to the IMB model, to the extent that individuals are well informed, highly motivated, and skilled, they can initiate and maintain HIV preventive behavior. The IMB model views information, motivation, and skills as primary determinants of HIV preventive behavior.

Whitehead's model posits that men's continual goal is to achieve masculine status through a balanced expression and exhibition of *masculine respectability* and *masculine reputation*. Attributes of masculine respectability include economic independence, economic providing, responsibility, self-discipline, employment, and/or a college degree as well as respectable material possessions, such as a house or car. Attributes of masculine reputation to achieve bigness include sexual prowess, risk taking, toughness, and aggressive behavior. Whitehead suggests that men who over-rely on attributes of masculine reputation to achieve bigness have a *fragmented sense of the gender self* (Whitehead, 1997). The implication for intervention design is that there should be male-based intervention programs that promote a sense of masculine gender identity that is *whole*, for example, balanced more heavily on respectability than reputation attributes to achieve high status. Thus, Whitehead's (Whitehead, 1992) BM/LMC provided a theoretical framing of the BLHL intervention to challenge masculine ideologies that contribute to HIV risk for black men. This model of black masculinity was a core element of the intervention design that helped address HIV risk through reducing reliance on reputational attributes of masculinity and increasing use of respectability attributes that decrease HIV risk.

The BLHL intervention informs participants about HIV risks and partner selection, health protective sexual communication, personal and social motivations to engage in HIV prevention behavior, and models of masculinity. Personal motivation includes favorable attitudes toward performance of HIV preventive acts related to respectability attributes, such as responsibility and protection of partners. Social motivation includes perceived social support for performing these acts to encourage behavior change. The BLHL intervention provides practice and skill training in reducing their HIV risk in the following factors as they express their masculinity: HIV and other STI testing, condom use and selection, sexual health and HIV communication, and maintaining healthy relationships.

BLHL has two primary components, a Brotherhood Retreat and a Retreat Message Maintenance Phase. All activities were designed to achieve three primary objectives that were established by the RIAT:

- Support men to identify and develop healthy ways to obtain respect and foster positive reputations.
- Inform, motivate and provide skills for individual men to protect themselves, their partners, and the collegiate community from HIV.
- Influence group-level social norms and create peer support for men to protect themselves.

The Brotherhood Retreat includes five consecutive 2- to 3-hour sessions that were delivered during weekend retreats of up to 20 participants. Table 1 contains a session by session list of objectives and key messages. The key messages defined the content needed in the Retreat to address the objectives of each session. Messages were based on the theoretical models guiding the study (i.e., IMB and BM/LM) and findings from the formative phase. Each retreat was conducted by two trained peer facilitators and supported by two or three trained peer educators. These facilitators and peer educators were male undergraduate or graduate students between the ages of 21 and 30, who were certified and trained as peer health educators using The Bacchus Network (2012) curriculum and who identified with the reference group—black heterosexually active men. They also were trained in the BLHL curriculum by the principal investigators, the project coordinator, and doctoral student graduate assistants.

The BLHL Messages Maintenance Phase was a 3-month follow-up to the retreat during which key messages from the curriculum as well as prevention messages developed by participants during the retreat were delivered as a targeted health communication campaign. Messages were delivered by the graduate assistant working on the project using a variety of approaches including: Twitter tweets five times a day (Monday–Friday) with 140 character-long prevention messages created during the Brotherhood Retreat; biweekly postings of key prevention messages from the curriculum on the BLHL Facebook page; and biweekly text message and e-mail reminders (Monday and Thursday) of elements of the group risk-reduction plans developed during the retreats.

### RECRUITMENT

Student Affairs offices at UNCG and NCA&T provided the research team with the e-mail addresses of all enrolled African American/black male students between the ages of 18 and 24. We e-mailed these students to invite them to complete a brief online screening survey and to learn more about the intervention and study. We also recruited students through peer networking using members of the Student RIAT, campus recruitment tables, and campus events. After providing informed consent, participants either completed the screening survey online or on paper hard copy. To be eligible, students had to: self-identify as male and black or African American; be 18 to 24 years old; report unprotected vaginal and/or anal intercourse with two or more female partners in the past three months; currently be enrolled as a student at UNCG or NCA&T; report HIV negative or unknown status; be fluent in English; and provide informed consent. Students were excluded if they: reported injection drug use in the past three years; reported oral or anal sex with a man in the past five years; reported enrollment in any HIV prevention or substance abuse study in the past six months; served on the Student RIAT; participated in the formative phase of intervention development; or were involved in the development of the intervention. Project staff and graduate assistants informed eligible men about the intervention and invited them to participate in the Brotherhood Retreat on one of three consecutive weekends. We continued recruiting students on a rolling basis until all three Brotherhood Retreat weekends were filled.

TABLE 1. The BLHL Brotherhood Retreat Small Group Intervention Curriculum Outlined

ABBREVIATED OBJECTIVES:	KEY MESSAGES:
<b>Session 1: Big Man/Little Man Model of Masculinity</b>	
1. Learn how masculinity expression for black heterosexually active males is explained by Whitehead's Big Man/Little Man Model.	1. A balanced masculinity is one in which men use respectability and reputational attributes of Big Man/Little Man to maintain healthy masculine expression.
2. Discuss how the ways that men obtain masculine status can lead to risky sexual behavior and decision making in relationships.	2. Key to a healthy masculine expression is being able to control sexual impulses.
3. Identify healthy ways of obtaining respect and positive reputations as heterosexual black men in the college setting.	3. Responsible men protect themselves and their partners from HIV risk by practicing safer methods.
<b>Session 2: HIV Risk Assessment &amp; Protection Options</b>	
1. Demonstrate knowledge and understanding of how HIV is transmitted.	1. Each sexual behavior has its own risk for HIV, and risk can increase or decrease based on the circumstances of the sexual act.
2. Increase understanding of HIV risk and protection for a range of sexual behaviors.	2. Conspiracy beliefs about origins of HIV and cures do not protect against HIV transmission.
3. Address myths and misperceptions about HIV origins, transmission, and treatment.	3. Men should search reliable sources to educate themselves about the misconceptions about HIV origins, transmission, and treatment.
<b>Session 3: Healthy Love: Safe &amp; Satisfying Intimate Relationships</b>	
1. Discover ways of achieving sexual satisfaction while being safe.	1. Safer sex can be pleasurable and enjoyable.
2. Learn correct condom use and how to reduce condom problems during sex.	2. There are a variety of ways to get sexual pleasure that are not risky for HIV.
3. Identify personal components of sexual satisfaction.	3. Planning and being prepared for the possibility of having sex help reduce risk.
4. Identify best practices for planning and carrying out safer sexual encounters for each type of intimate relationship (e.g., wifey, jump-offs, boppers).	
5. Broaden knowledge and skills to use a range of risk reduction strategies.	
<b>Session 4: Sexual Health Communication</b>	
1. Critically consider the criteria men use to select sex partners, sexual values, and ideas of sexual protection before entering into sexual relationships.	1. Having frequent sex or many sex partners is not an essential part of a healthy masculine expression and can be risky for HIV.
2. Discuss societal, interpersonal, and personal expectations of masculinity, gendered ideas of relationships, and their relation to HIV risk.	2. Knowing your sex partners means talking to them about sexual history, HIV testing, and condom use before any sexual behavior with that person.
3. Identify the value of communicating openly and honestly with sex partners.	3. Only enter sexual relationships with women that possess characteristics and values you most want out of relationships to reduce your risk.
4. Recognize importance of health protective sex communication about sex history, condom use practices, and HIV testing.	
<b>Session 5: Bringing It Together: Consensus Building and Peer Advocacy</b>	
1. Think critically about sexual selves and how to have healthy sexual relationships.	1. Peer groups can reduce HIV transmission if members advocate and support risk reduction strategies for each other.
2. Recognize importance of peer support for risk reduction strategies.	2. Notions about gender and masculinity influence sexual risk behaviors, and changes to masculine expression can protect against HIV risk.
3. Develop individual and group risk reduction plans.	

## PARTICIPANTS

A total of 245 men completed the initial screening process, of which 81 were eligible to participate in the intervention. Of these eligible 81 men, 64 (79%) agreed to participate in the intervention and completed the baseline survey, and 57 (89%) attended a Brotherhood Retreat (38 from UNCG and 19 NCA&T). All but three of these 57 men completed a 3-month follow-up survey. The final sample was thus 54 male college students who completed the baseline, immediate posttest, and 3-month follow-up surveys. There were no significant differences between eligible men who chose to participate and those who declined for each of the demographic and risk screening variables. Table 2 provides a summary of participant demographic characteristics at baseline.

## RESEARCH DESIGN

We used a treatment group-only design to pilot test the BLHL intervention. Participants completed baseline, immediate posttest, and 3-month follow-up assessments to measure program effects. Participants completed baseline assessments either online prior to the scheduled Brotherhood Retreat or in paper format prior to attending the Retreat. Each participant completed the immediate posttest assessment at the end of the Retreat, prior to leaving the Retreat site. Three-months after the Retreat, we e-mailed participants a link and asked them to complete the follow-up assessment online. On average, participants took about 30 minutes to complete the baseline and 3-month follow-up assessments, and about 15 minutes to complete the immediate posttest. Participants were paid a total of \$200 to complete the eligibility screening (\$5), baseline, intervention, and posttest (\$160), and the 3-month follow-up (\$35).

## MEASURES

### *Behavioral Outcomes.*

1. Past three-month sexual behavior. Participants answered a series of open-ended questions about the frequency with which they had engaged in different sexual behaviors over the past three months. We used their responses to determine: a) the number of women they had sex with; b) the number of times they had vaginal sex without a condom compared to the total number of times they had vaginal sex; and c) the number of times they had any vaginal, anal, or oral sex without a condom compared to the total number of times they had any sex. For b) and c), we treated non-plausible scores (e.g., proportion scores > 1) as missing.
2. Protection at last vaginal intercourse. Students were asked, "Did you or your partner(s) use a method to prevent pregnancy the last time you had vaginal intercourse?" Students who answered "yes" were then asked to check which specific method(s) they had used. Based on their responses, we created three indicator variables: a) used at least one barrier method (e.g., condom, IUD); b) used at least one hormonal method (e.g., patch, pills, implant); and c) used both a barrier and a hormonal method.
3. Condom errors and problems. We used indices developed by Crosby and colleagues (2008) to assess the frequency with which participants experienced condom errors (i.e., incorrectly using a condom) and condom problems (i.e.,

TABLE 2. Baseline Sample Characteristics of BLHL Retreat Participants ( $n = 57$ )

Variable		
Age in years	20.7 ( $\pm 1.6$ ), range 18–24	
Cumulative grade point average	2.78 ( $\pm .39$ ), range 1.86–3.66	
	Count ( $n$ )	Percent (%)
Year in School		
Freshman	4	7.0
Sophomore	16	28.1
Junior	14	24.6
Senior	12	21.0
Senior 5+ years	7	12.3
Graduate student	4	7.0
School Enrollment Status		
Full-time	56	98.2
Part-time	1	1.8
School of Attendance		
UNCG	38	66.7
NC A&T	19	33.3
Parents' Education Level		
	Mother [count (%)]	Father [count (%)]
Less than high school	2 (3.5)	2 (3.5)
High school/GED	7 (12.3)	16 (28.1)
Some college	13 (22.8)	13 (22.8)
Associates degree	8 (14.0)	4 (7.0)
4-year college degree	12 (21.0)	14 (24.6)
Graduate degree	14 (24.6)	5 (8.8)
Not known	1 (1.8)	3 (5.3)
Involved in Student Organizations		
Non-athletic student organizations	32	56.1
College athletic teams/organizations	8	14.0
No involvement	22	38.6
Relationship Status		
Not in a relationship	27	47.4
In a monogamous relationship, not living together	17	29.8
In a monogamous relationship, living together	5	8.8
In a nonmonogamous relationship, not living together	6	10.5
In a nonmonogamous relationship, living together	2	3.5
How Often You Think About Your Race		
Never	3	5.3
Once a year	5	8.8
Once a month	4	7.0
Once a week	10	17.5
Once a day	16	28.1
Once an hour	3	5.3
Constantly	16	28.1

problems while using a condom). To determine the total number of condom errors, participants were asked, "In the past 3 months, have you done any of the following when using a condom during sex?" (9 items; e.g., "placed condom on upside down and then turned it over"). Not selecting a protective behavior (e.g., "checked for visible damage before use") was counted as an error. Participants were also asked, "In the past 3 months, have you had any of the following problems when using a condom during sex?" (6 items; e.g., "condom slipped off during sex"). Based on their responses, we created a variable to indicate whether a participant had experienced any condom problems in the past three months. Participants who did not report any condom use were treated as missing for both variables.

*Potential Mediators/Proximal Outcomes.* Because of our intervention group-only design, we could not test whether the proximal outcomes mediated the effects of the intervention on the behavioral outcomes, but we did test whether proximal outcomes changed from baseline to posttest and 3-month follow-up.

1. Knowledge. We assessed two types of knowledge that were targeted by the intervention. HIV knowledge measured participants' knowledge about HIV transmission and prevention. All 18 true/false items were drawn from the Brief HIV Knowledge Questionnaire (Carey & Schroder, 2002). Condom application knowledge measured whether participants recalled the steps required to properly use a condom. Specifically, participants were taught to use the acronym "OPRAH" to help them recall the steps for proper condom application. Participants provided open-ended text responses to indicate what each letter in "OPRAH" stood for. We counted any responses that included the main word (i.e., O = "open," P = "pinch," R = "roll," A = "action," and H = "hold") as correct.
2. Attitudes. Three types of attitudes were targeted by the BLHL intervention: participants' own attitudes toward condom use, their perceptions of social norms about condom use, and their attitudes about masculinity. To measure attitudes and norms about condom use, we used two subscales from the Sexual Risks Scale (DeHart & Birkimer, 1997): attitudes (13 items; e.g., "People can get the same pleasure from 'safer' sex as from unprotected sex") and norms (7 items; e.g., "My friends and I encourage each other before dates to practice 'safer sex'"). Participants rated the extent to which they agreed with each item from 1 (*strongly disagree*) to 5 (*strongly agree*). Both subscales were validated with a sample of college students (DeHart & Birkimer, 1997) and demonstrated high internal reliability in the current study ( $\alpha = 0.82$  to  $0.94$ ). We coded all items such that higher scores indicated more positive attitudes and norms about condom use. Masculinity attitudes capture how participants thought that men should behave and the characteristics that men should possess. To measure masculinity attitudes, participants rated the degree to which they agreed with 24 statements from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were developed in a prior ethnographic study (Aronson et al., 2003) and were informed by the dimensions of the BM/LMC model. The items were further refined through in-depth interviews and focus groups with African American/black male college students (Baber, Aronson, & Melton, 2005). These items were divided into three subscales: goodness (12 items; e.g., "A man should have integrity";  $\alpha = 0.91$  to  $0.97$ ), respectability (5 items; e.g., "A man should be self-disciplined";  $\alpha = 0.96$

- to 0.98), and reputation (7 items; e.g., “A man should be feared by others”;  $\alpha = 0.62$  to 0.82).
3. Condom use self-efficacy. Condom use self-efficacy was participants’ confidence that they could effectively use condoms in different situations. We captured different dimensions of condom use self-efficacy using four subscales from the Condom Use Self-Efficacy Scale (Brafford & Beck, 1991), which was validated with a sample of college students. Participants rated the extent to which they agreed with each item from 1 (*strongly disagree*) to 5 (*strongly agree*). The four subscales were: Condom Mechanics (4 items; e.g., “I feel confident in my ability to put a condom on”;  $\alpha = 0.76$  to 0.91), Partner Approval (4 items; e.g., “If I were to suggest using a condom to a partner, I would feel afraid that she would reject me”—reverse coded;  $\alpha = 0.69$  to 0.90), Assertiveness (4 items; e.g., “I feel confident in my ability to discuss condom usage with any partner I might have”;  $\alpha = 0.83$  to 0.94), and Intoxicants (3 items; e.g., “I feel confident that I would remember to use a condom even if I were high”;  $\alpha = 0.74$  to 0.89).
  4. Communication. Sexual Health Communication was operationalized as the frequency with which participants had discussed specific topics with new sex partners over the past three months. To measure sexual health communication, we used nine items from Catania’s (1998) Health Protective Sexual Communication Scale (e.g., “How often in the past three months have you... asked a new sex partner about the number of past sex partners she had?”). We omitted one item from the original scale that asked about discussing homosexual experiences with a new partner because men who had sex with men in the past five years were excluded from this study. To capture health communication specific to the intervention, we also added two items: “asked partner about HIV status” and “partner asked you about HIV status.” Responses ranged from 1 (*always*) to 4 (*never*) ( $\alpha = 0.92$  to 0.96). Sexual self-disclosure was operationalized as the extent to which participants discussed different topics with an intimate partner. To measure sexual self-disclosure, we used six items (e.g., “what I want from a sexual encounter”) from the Sexual Self-Disclosure Scale (Snell, Belk, Papini, & Clark, 1989). Responses ranged from 1 (*I do not discuss this topic with my intimate partners*) to 5 (*I fully discuss this topic with my intimate partners*) ( $\alpha = 0.85$  to 0.86).
  5. Safer sex intentions. To measure the extent to which participants planned to engage in safer sex behaviors, we asked students to rate their level of agreement with four statements from 1 (*strongly disagree*) to 5 (*strongly agree*). All four items were from the Health Belief Model Intentions for Safer Sex Scale (Lux & Petosa, 1994). We excluded two items from the original scale because they do not apply to sexually active college students (i.e., “I do not plan on having sex until I am at least 18 years old”; “I will not have sex until I am married”). The resulting four-item scale had low reliability ( $\alpha < 0.70$ ). Follow-up analyses indicated that two pairs of items were significantly correlated with each other; therefore, we split the full scale into a two-item relationship intent measure (e.g., “I will only have sex with someone I have a long-term relationship with”;  $r = 0.55$  to 0.72) and a two-item condom use intent measure (e.g., “I will not have sex with someone who refuses to use a condom”;  $r = 0.35$  to 0.57).

*Program Acceptability.* To determine whether the BLHL intervention was acceptable to the participants, we asked them to rate whether each session addressed important

TABLE 3. Results for Behavioral Outcomes ( $n = 54$ )

Behavioral Outcomes	Pretest	3 Months	F-value/Z-score
Past 3-Month Sexual Behavior			
Number of Sex Partners	9.08 (12.12)	10.80 (21.72)	0.43
Proportion of Vaginal Sex that was Unprotected	0.56 (0.37)	0.29 (0.34)	15.39***
Proportion of Any Sex that was Unprotected	0.70 (0.23)	0.56 (0.30)	5.36*
Protection at Last Vaginal Intercourse			
Used Protection at Last Vaginal Intercourse	0.72 (0.45)	0.85 (0.36)	2.31*
Type of Protection Used			
Used 1+ Barrier Method	0.51 (0.50)	0.74 (0.44)	2.98**
Used 1+ Hormonal Method	0.39 (0.49)	0.57 (0.50)	2.24*
Used Both Hormone and Barrier Method	0.21 (0.41)	0.46 (0.50)	2.98**
Past 3-Month Condom Errors and Problems <sup>a</sup>			
Total Number of Condom Errors	3.35 (1.41)	1.96 (1.51)	14.46***
At Least One Problem	0.69 (0.47)	0.58 (0.50)	-0.91

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ; <sup>a</sup> $n = 26$ ; any participant who had not used condoms at both assessments was treated as missing.

issues facing black male college students in America and whether each session was presented in ways that black male college students could relate to and understand. Responses could range from 1 (*strongly disagree*) to 5 (*strongly agree*). These questions were asked at the immediate posttest and 3 month follow-up.

#### DATA ANALYSIS

We analyzed outcome variables that included continuous data using repeated measures ANOVA. For behavioral outcomes and proximal outcomes that were only measured twice, we tested for differences from baseline to 3-month follow-up level. For proximal outcomes that were measured at all three assessments, we used planned contrasts to compare (a) responses at immediate posttest to responses at baseline and (b) responses at 3-month follow-up to responses at baseline. In each instance when the assumption of sphericity was not met, we used the Greenhouse-Geisser correction. We analyzed outcome variables that included only binary responses with McNemar's test for the significance of changes and provide Z-values instead of F-values in the table.

## RESULTS

### BEHAVIORAL OUTCOMES

*Past Three-Month Sexual Behavior.* The changes in behavioral outcomes from baseline to 3-month follow-up are summarized in Table 3. The number of sexual partners in the past three months did not change significantly ( $F = 0.43$ , *ns*). Upon further inspection, however, it was clear that this non-significant change was primarily due to a few participants who reported an extraordinarily large number of partners at follow-up. Overall, the proportion of participants who had many sexual partners actually decreased from baseline to follow-up. As shown in Figure 1, 22 participants had six or more partners at baseline, whereas only 12 participants had this many sex partners at follow-up. Further, 32 participants had three or fewer partners at follow-

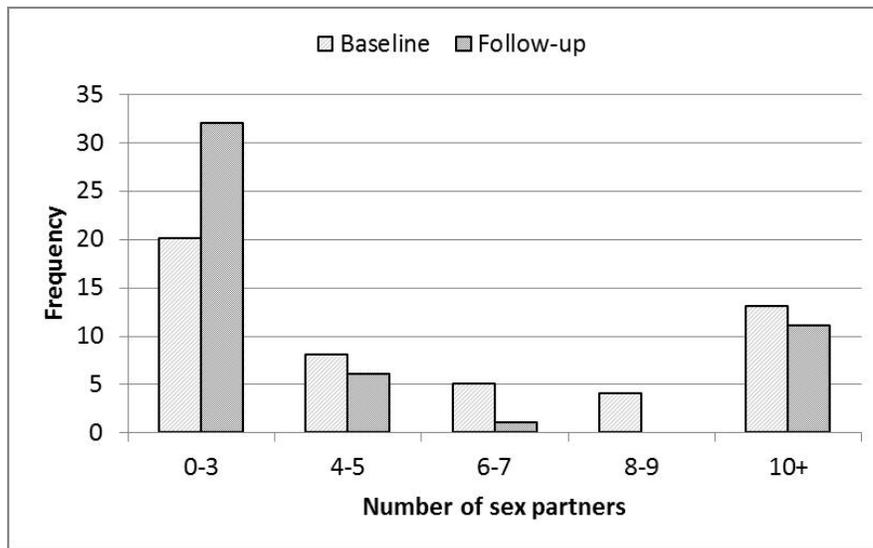


FIGURE 1. Number of Sex Partners at Baseline Compared to 3-Month Follow-Up

Each bar indicates how many participants had a particular number of sex partners at baseline and follow-up. For example, at baseline, 20 people had between 0 and 3 sex partners, whereas at follow-up, 32 people had between 0 and 3 sex partners.

up, compared to only 20 participants at baseline. Framed another way, 44% of participants had fewer partners at follow-up, 28% had the same number of partners, and only 28% had more sexual partners. More importantly, the average proportion of vaginal sexual encounters that were unprotected decreased significantly from 0.56 at baseline to 0.29 at follow-up ( $F = 15.39, p < 0.001$ ). The average proportion of unprotected sexual encounters of any type also decreased significantly from 0.70 at baseline to 0.56 at follow-up ( $F = 5.36, p < 0.05$ ).

*Protection at Last Vaginal Intercourse.* The proportion of participants who reported using any protection the last time they had vaginal intercourse increased significantly from 0.72 at baseline to 0.85 at follow-up ( $Z = 2.31, p < 0.05$ ). Specifically, the proportion of participants who used at least one hormonal method increased significantly from 0.39 to 0.57 ( $Z = 2.24, p < 0.05$ ), the proportion of participants who used at least one barrier method increased significantly from 0.51 to 0.74 ( $Z = 2.98, p < 0.01$ ), and the proportion of participants who used both a hormonal and a barrier method of protection increased significantly from 0.21 to 0.46 ( $Z = 2.98, p < 0.01$ ).

*Condom Errors and Problems.* The average number of condom errors dropped significantly from 3.19 at baseline to 2.15 at follow-up ( $F = 16.79, p < 0.001$ ). The proportion of participants who reported at least one condom problem was lower at follow-up ( $M = 0.58$ ) than at baseline ( $M = 0.69$ ), but the difference was not significant ( $Z = -0.90, ns$ ).

TABLE 4. Results for Mediators ( $n = 54$ )

	Baseline	Posttest	3 Months	F-value
Knowledge				
HIV Knowledge	12.79 (4.14)	16.43 (1.63) <sup>a</sup>	15.02 (3.48) <sup>a</sup>	22.70***
Condom Application Knowledge	0.16 (0.59)	4.65 (0.83) <sup>a</sup>	3.46 (1.87) <sup>a</sup>	226.79***
Attitudes				
Attitudes toward Condom Use	3.26 (0.70)		3.52 (0.86)	5.59*
Norms toward Condom Use	3.24 (0.82)		3.63 (0.66)	13.67**
Masculinity Attitudes: Goodness	4.42 (0.78)		4.61 (0.44)	3.19
Masculinity Attitudes: Respectability	4.60 (0.80)		4.71 (0.67)	0.75
Masculinity Attitudes: Reputation	3.66 (0.70)		3.87 (0.63)	4.39*
Condom Use Self-Efficacy				
Condom Mechanics	4.23 (0.90)	4.85 (0.30) <sup>a</sup>	4.50 (0.57) <sup>a</sup>	17.53***
Partner Approval	4.19 (0.88)	4.51 (0.63)	4.29 (0.84)	2.47
Assertiveness	4.16 (0.95)	4.75 (0.55) <sup>a</sup>	4.63 (0.62) <sup>a</sup>	11.10***
Intoxicants	3.96 (1.03)	4.60 (0.54) <sup>a</sup>	4.37 (0.67) <sup>a</sup>	12.96***
Communication				
Sexual Health Communication	2.88 (0.78)		2.71 (0.91)	1.34
Sexual Self-Disclosure	3.40 (0.97)		3.61 (0.88)	3.37
Safer Sex Intentions				
Relationship Intent	2.96 (1.00)	3.33 (1.12) <sup>a</sup>	3.46 (0.92) <sup>a</sup>	5.91**
Condom Use Intent	3.55 (0.97)	4.46 (0.65) <sup>a</sup>	4.05 (0.84) <sup>a</sup>	23.76***

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ; <sup>a</sup> significantly different from baseline.

### POTENTIAL MEDIATORS/PROXIMAL OUTCOMES

Results for changes in the mediators/proximal outcomes are presented in Table 4.

*Knowledge.* There was a significant overall effect for both HIV knowledge ( $F = 22.70$ ,  $p < .001$ ) and condom application knowledge ( $F = 226.79$ ,  $p < .001$ ). Specifically, HIV knowledge increased significantly from baseline ( $M = 12.79$ ) to immediate posttest ( $M = 16.43$ ) and remained significantly higher than baseline at follow-up ( $M = 15.02$ ). Condom application knowledge also increased significantly from baseline ( $M = 0.16$ ) to immediate posttest ( $M = 4.65$ ), and remained significantly higher than baseline ( $M = 3.46$ ) at follow-up.

*Attitudes.* There was a significant overall increase in both positive attitudes toward condom use ( $F = 5.59$ ,  $p < 0.05$ ) and positive peer norms toward condom use ( $F = 13.67$ ,  $p < 0.01$ ) from baseline to follow-up. There was no significant change in either goodness ( $F = 3.19$ , *ns*) or respectability ( $F = 0.75$ , *ns*) masculinity attitudes, but there was a small increase in reputation masculinity attitudes from baseline to follow-up ( $F = 4.39$ ,  $p < .05$ ).

*Condom Use Self-Efficacy.* There was a significant overall effect for self-efficacy with respect to condom mechanics ( $F = 17.53$ ,  $p < 0.001$ ), assertiveness ( $F = 11.10$ ,  $p < 0.001$ ), and intoxicants ( $F = 12.96$ ,  $p < 0.001$ ), but not partner approval ( $F = 2.47$ , *ns*). Specifically, self-efficacy for condom mechanics, assertiveness, and intoxicants

TABLE 5. Results for Program Acceptability ( $n = 54$ )

	Posttest	3 Months
Importance of Each Session		
Session 1: Masculinity	4.56 (0.79)	4.07 (1.01)
Session 2: HIV Risk Assessment & Protection	4.61 (0.71)	4.31 (1.02)
Session 3: Healthy Love	4.57 (0.79)	4.22 (1.04)
Session 4: Sexual Communication	4.52 (0.82)	4.13 (1.08)
Session 5: Bringing It Together	4.48 (0.82)	4.13 (1.10)
Relevance of Each Session		
Session 1: Masculinity	4.64 (0.79)	4.11 (1.10)
Session 2: HIV Risk Assessment & Protection	4.64 (0.76)	4.23 (1.05)
Session 3: Healthy Love	4.60 (0.77)	4.26 (1.00)
Session 4: Sexual Communication	4.64 (0.76)	4.11 (1.09)
Session 5: Bringing It Together	4.53 (0.85)	4.15 (1.06)

all increased significantly from baseline to posttest, and remained significantly different from baseline at follow-up.

*Communication.* There was no significant change from baseline to follow-up in either sexual health communication ( $F = 1.34$ ,  $ns$ ) or sexual self-disclosure with new partners ( $F = 3.37$ ,  $ns$ ).

*Safer Sex Intentions.* There was a significant overall effect for both relationship intent ( $F = 5.91$ ,  $p < 0.01$ ) and condom use intent ( $F = 23.76$ ,  $p < 0.001$ ). Specifically, both relationship intent and condom use intent increased significantly from baseline to posttest, and remained significantly higher than baseline at follow-up.

#### PROGRAMACCEPTABILITY

At the immediate posttest, participants' average ratings of the overall importance of each session were all above 4.4 on a 1–5 scale (Table 5), as were participants' average ratings of the overall relevance of each session. The average ratings all remained above 4 on the 5-point scale at follow-up.

#### DISCUSSION

This pilot test of the BLHL intervention provides promising evidence of program efficacy with a sample of African American/black heterosexually active college men in North Carolina. The intervention was designed using CBPR that included the collection and analysis of local formative data, and it was implemented using a small-group weekend retreat combined with a three-month maintenance phase. The BLHL intervention was designed to be culturally congruent and tailored to college student men. Results show significant changes between the baseline and 3-month follow-up assessments in behavioral outcomes, including reductions in unprotected sex, increase in protection during last intercourse, and fewer condom errors. The majority of hypothesized program mediators also changed significantly in the expected direction. These demonstrated changes suggest that men exposed to this intervention will

see changes that reduce their risk for HIV. Of the 21 outcomes and mediators that we assessed, only number of sexual partners, masculinity attitudes, sexual health communication, and sexual self-disclosure did not show a significant change after the intervention.

Regarding the number of sexual partners, we noted that most participants reported a decrease in the number of sexual partners. The non-significant change was primarily due to a few men with very high numbers of sexual partners at follow-up who skewed the mean. Regarding communication and sexual self-disclosure, these represent challenging interpersonal factors that may be difficult to change without the involvement of their partners.

Changes in the masculinity scores for respectability and reputation were not significantly affected by the intervention, despite the integration of masculinity messages throughout the intervention and maintenance phases. This may be the result of at least two important factors. First, changes in masculinity attitudes take time and a great deal of support in the contexts in which men express their masculinity. Ideas that are received in the context of a weekend retreat may be difficult to maintain when these men return to their usual contexts and social networks. Second, we lack culturally congruent, thoroughly tested, and validated measurement tools to assess masculinity attitudes. Based on our formative research, we believe that the masculinity items we used were meaningful to the population; however, more work is needed to refine the measure (e.g., frame the questions and response categories appropriately). Further testing of the scales with a larger sample is needed to assess their psychometrics.

Notably, participants perceived the intervention as important and relevant to the context of their lives as students. Our ability to recruit, enroll, and maintain the involvement of 95% of our participants over a three-month time frame provides evidence of intervention feasibility. We attribute much of the success in terms of intervention acceptability and feasibility to the high level of student engagement in the CBPR process.

One important limitation of this study is related to the absence of a comparison or control group. Because of this, we do not know whether the observed changes were exclusively due to our intervention rather than other changes that occurred over the same time period. This study was conducted at two colleges in North Carolina, one predominantly white and one historically black. The two campuses were located within a few miles of each other and had shared social and sexual networks. Generalization of the findings to other populations (such as college-age men not enrolled in college) or other contexts (such as urban low income communities) may not be appropriate. Further, this study relied on self-reported sexual behavior. However, self-reported behavior has been found to be reliable when attention is given to creating a safe and trusted context for participants to honestly share their behaviors (Fishbein & Pequegnat, 2000; Pequegnat et al., 2000). Further research with a larger sample size could use biological outcomes such as new diagnosis with an STI to evaluate the intervention. This study also had a short follow-up period; longer follow-ups must be obtained to test whether behavior change can be maintained.

Given our promising results, a more rigorous evaluation of the BLHL intervention is warranted. A future evaluation study should include a comparison group (preferably a randomized control group); to be acceptable to all members of a CBPR team, the best study design may involve an intervention-delayed group or a comparison intervention that addresses another health priority among African American/black college men. Further, the initial success of this pilot test with exclusively higher

risk men may warrant the testing of the intervention with a more representative sample of African American/black college men.

## CONCLUSIONS

Glaring gaps exist in the current intervention arsenal available to reduce the risk of HIV among some vulnerable populations, including African American/black men. There is a dearth of science-based, culturally congruent interventions to prevent HIV. Our evaluation of the BLHL intervention is promising; we found increases in consistent condom use and HIV testing from baseline to 3-month follow-up among a sample of higher risk heterosexually active African American/black college-age men. This intervention reaches young African American/black men in the campus community as opposed to waiting until they seek clinical services for HIV and/or STD symptoms.

Further research is necessary to explore maintenance of condom use and HIV testing behaviors over longer periods of time. Moreover, determining whether this type of intervention can impact HIV-related behaviors of other college-age communities deserves exploration. For example, this intervention may serve as a foundation for other targeted or enhanced interventions to reduce risk within communities of African American/black MSM and African American/black women.

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