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DEVELOPING AN EVIDENCE-BASED HIV TESTING MESSAGE FOR YOUNG AFRICAN AMERICAN WOMEN

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

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Dedication

In loving memory of my grandmother Mary. I will never forget you.

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Abstract

DEVELOPING AN EVIDENCE-BASED HIV TESTING MESSAGE FOR YOUNG AFRICAN AMERICAN WOMEN

By Melanie Paige Moore, M.S.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2019

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African American women have the highest rates of HIV infection among women of all racial/ethnic groups in the United States, and over 50% of HIV infected young adults are unaware of their infection. HIV testing is a cost-effective mechanism for reducing HIV transmission. Despite this, limited research has been devoted to developing interventions specifically promoting HIV testing. This two-part study proposed to address this gap through developing a culturally tailored HIV testing message aimed at increasing HIV test intentions among young African American women. The Health Belief Model was this study's primary theoretical framework. Study 1 was a quantitative study that examined predictors of HIV testing history and future HIV test intentions among 109 African American women aged 18-24. Participants were recruited at two universities, online, and via word of mouth. Measures on sexual behavior, HIV knowledge, HIV conspiracy beliefs, gender role beliefs, gender ratio imbalance beliefs were included in the survey. Next, a culturally tailored HIV testing message

was developed based on findings from Study 1 which identified significant predictors of HIV testing and HIV test intentions. Findings revealed that number of sexual partners, perceived barriers, and perceived benefits were significant predictors of past HIV testing. Number of sexual partners, perceived importance of HIV testing, and perceived seriousness were significant predictors of intentions to be tested for HIV in the next 3 months. Study 2 compared the exposure effect of the tailored message to a generic HIV testing message on self-reported HIV test intentions in the next 3 months among African American women ages 18-24. Participants first completed measures on HIV test history and sexual behavior at pretest, next they were randomly assigned to the tailored or the generic HIV testing message. Post measure exposure participants were asked how likely they were to get tested for HIV in the next 3 months, followed by several questions that measured the health message's acceptability. Findings revealed no significant differences between the health message groups on future HIV test intentions. There were also no significant differences between groups on the message acceptability outcomes.

Introduction

HIV is a major health epidemic that continues to disproportionately impact African American women in the United States. African American women have the highest rate and risk for HIV infection of all racial/ethnic groups of women (across all age groups). Current prevalence estimates indicate that 1 in 48 Black women will become infected with HIV within their lifetime (Centers for Disease Control and Prevention [CDC], 2019a). While rates of HIV infection among African American women decreased by 42% from 2005 to 2014 (CDC, 2016a), African American women still have alarmingly high rates of HIV infection. African American women currently represent 60% or nearly 2 out of every 3 HIV diagnoses among women (CDC, 2019a). They have the fourth highest HIV infection rates behind Black, White, and Latino men who have sex with men (MSM) (CDC, 2019a), which further highlights their high risk for HIV infection. While progress has been made in decreasing HIV infection rates among African American women, increased HIV prevention efforts are needed to continue declines in HIV infection given that the current risk for HIV infection remains high among this population.

A major impediment to HIV prevention efforts among young African American women, are undiagnosed HIV infections. The CDC estimates that 44% of HIV-positive youth aged 18-24 — the majority which are African American youth — are unaware they are infected with HIV (CDC, 2015a). Across the general population, 15% of HIV-positive persons live with an undiagnosed infection (CDC, 2019b). These figures indicate that the rate of undiagnosed HIV infection among young adults in this age range is at least 3 times that of the general adult population. The high rates of undiagnosed HIV infection among young adults and high rates of HIV infection among African American women support the focus of the proposed research.

The only way for a person to accurately know their HIV status is through HIV testing. The CDC recommends that all persons be tested for HIV at least once in their lives and that persons at high risk be tested more often (Branson et al., 2008). Increased HIV testing is needed to reduce the rate of new transmissions and to link HIV positive individuals to healthcare. Undiagnosed infections are responsible for over 50% of new HIV infections, as persons unaware of their HIV infection are significantly more likely to transmit the virus than those who know their positive status (Marks, Crepaz, & Janssen, 2006). Thus, increased rates of HIV testing can decrease rates of HIV transmission.

Despite the established benefits of HIV testing, the current literature is sparse on HIV testing among young adults including African American women. Much of the existing research examines demographic and sexual behavior correlates of HIV testing. In addition, few studies have developed evidence-based health messages to specifically promote HIV testing among young adults or African American women, despite their high risk of HIV infection. This dissertation conducted formative work to identify variables linked to HIV testing (beyond demographics and sexual risk variables) that were included in the development of a culturally tailored HIV test message for young African American women. This study occurred in three stages: Stage one (Study 1) was a formative quantitative study to identify factors that contributed to HIV testing history and HIV testing intentions. Health message development occurred in stage two. Stage three (Study 2) examined the developed messages through a pilot feasibility study. This research focused on young African American women aged 18-24 given their high risk for HIV infection and increased likelihood of living with an undiagnosed infection.

Review of the literature

HIV Testing Among Young Adults

The CDC recommends that all persons aged 13-64 get tested for HIV at least once in their lives, and that persons at increased risk for infection be tested annually or more often (CDC, 2017). Studies have found that testing rates among young adults range from 18% to 36% (Dennison, Wu, & Ickes, 2014; Gillien & Markey, 2013; Gullette & Lyons, 2006; Marelich & Clark, 2004; Nguyen, et al., 2006; Shapiro, J., Radecki, Charchian, & Josephson, 1999). High rates of undiagnosed HIV infection among young adults is partially explained by low rates of HIV testing in this population (CDC, 2016b). Adolescents and young adults ages 13-24 account for 22% of new HIV infections annually in the United States (CDC, 2016b). Young adults ages 20-24 represent 81% of infections among youth (CDC's 2016b). Despite being a high-risk group for HIV infection, most young adults do not adhere to the CDC's testing recommendations and have never been tested for HIV (CDC, 2016b).

Research on correlates of HIV testing among young adults is limited and the majority of research has examined demographic and sexual risk correlates of HIV testing. Demographic factors such as older age (Dennison, Wu, Ickes, 2015; Moore, 2013), being female (Anastasi, Sawyer, & Pinciaro, 1999; Dennison, Wu, Ickes, 2015), and being African American (Gillen & Markey, 2014; Moore, 2013), are associated with a greater likelihood of HIV testing. Sexual behavioral factors such as a larger number of sexual partners and sex without a condom are also correlated with increased HIV testing (Moore, 2013).

The Importance of HIV Testing in Reducing HIV Transmission

A key part of the National HIV/AIDs strategy is to expand HIV testing among communities and groups most affected by HIV (White House Office of National AIDS Policy, 2010). HIV testing provides numerous benefits. First, it is one of the most cost-effective methods in HIV prevention. Second, receiving an HIV test informs individuals of their HIV status, which

is important given that undiagnosed infections are responsible for more than 50% of new HIV infections. HIV positive persons who are aware of their infection are less likely to pass on the virus (Marks, Crepaz, & Janssen, 2006). It is also important given that 44% of HIV positive young adults ages 18-24 are living with an undiagnosed infection (CDC, 2016b).

Third, routine testing encourages "treatment as prevention." This HIV prevention strategy focuses on identifying HIV positive persons and quickly linking them to health care and antiviral therapy (ART). Studies have shown that initiating ART early can reduce chances of seroconversion (transmission of the virus) by up to 96% (Cohen et al., 2011). HIV positive individuals with low viral loads are less likely to pass on the virus to a sexual partner. Strict adherence to one's medical regimen can even result in an HIV positive person getting the virus under control to the point that they become "undetectable." Having an undetectable amount of the HIV virus does not mean one is cured, but achieving viral suppression is ideal as it greatly reduces the odds of HIV transmission during unprotected sexual contact (Cohen et al., 2011). Relatedly, routine testing may also encourage the uptake of PrEP utilization for women as a treatment as prevention measure for women who have an HIV positive partner or women who engage in high-risk sexual behaviors. If an HIV positive person is aware of their status and their sexual partner take PrEP medication as prescribed, their chances of contracting the virus are significantly reduced (McCormack et al., 2016).

Fourth, routine testing provides an opportunity to discuss and reinforce the importance of safer sex behaviors with a test counselor, healthcare provider or a romantic/sexual partner. These conversations may also prompt or coincide with testing for other sexual transmitted infections (STIs). Given that the presence of an STI during HIV exposure greatly increases the likelihood of transmission, this is also important in HIV prevention (CDC, 2010).

Ethnic Differences in HIV Testing

African Americans are more likely to be tested for HIV than their racial/ethnic counterparts. Studies have found that 41-60% of African Americans report ever being tested for HIV and 13-25% report recent testing in the past 6 months (Payne et al., 2006; St Rose, 2008; Thomas et al., 2008). A longitudinal study of mostly African American young adults (*N* = 80%) found that 76.8% had been tested for HIV at least once, and 40.2% had tested 2 or 3 times (Johns, Bauermeister, & Zimmerman, 2010). Another study using a national sample of U.S. adults ages 18-64 found that 59.7% of Blacks had ever been tested for HIV, compared to 42.4% of Whites and 45.6% of Latinos (Ebrahim, Anderson, Weidle, & Purcell, 2004). While differences in both HIV infection and prevalence rates of HIV testing exist, limited work has examined predictors of HIV testing beyond race/ethnicity.

Predictors of HIV testing have been largely unexamined in a comprehensive manner; however, emerging research has begun to examine these relations. A recent study by Moore, Javier, Abrams, & McGann (2016) examined differences in predictors of HIV testing by race/ethnicity. Findings from this study revealed that a greater number of sexual partners and more positive HIV testing attitudes predicted HIV testing for White students while being in a relationship was a unique predictor of HIV testing for African American students. These findings highlight that there are ethnic differences in factors that influence HIV testing and support the need for a deeper exploration of HIV testing motivations.

HIV Testing Messages and Interventions

Most HIV testing messages have been developed specifically for gay and bisexual MSM largely in the form of mass media campaigns. These messages have been delivered via websites, posters, flyers, radio stations, videos, and social media (French, Bonell, Wellings, &

Weatherburn, 2014; Hecht, Riggs, Hargraves, Wei, & Raymond, 2011; McOwan, Gilleece, Chislett, & Mandalia, 2002; Olshefsky, Zive, Scolari, & Zuñiga, 2007; Solorio et al., 2016). Other studies that have examined messages promoting HIV testing have largely tested gain-framed and loss-framed messages only (Bekalu & Eggermont, 2014; Hull & Hong, 2016). Gain-framed messages emphasize advantages associated with a behavior (e.g., I will obtain health benefits if I get tested for HIV), whereas loss-framed messages emphasized the associated disadvantages (e.g., I will have poor health if I do not get tested for HIV). Studies further examining effective elements of testing messages suggest that including detailed information about where to get tested (McOwan et al., 2002), messages with targeted peer images (McOwan, et al., 2002), and messages that are simple and clear (Hilliam, Fraser, &Turner, 2011), are important elements to include in interventions promoting HIV testing.

HIV Testing Messages and Interventions among African American Women.

Few studies have systemically investigated HIV testing interventions among African American women. Of the studies, two have examined message framing effects on HIV testing and a third developed a social networking intervention to promote HIV testing. An additional study examined preferences for communication of HIV testing messages among African American women.

The first message framing study (Kalichman & Coley, 1995) evaluated the effect of three framed videotapes message conditions on HIV test intentions and behavior among 100 African American women at a women's health clinic. *Condition one* was an ethnicity-matched information control condition. This control condition included a 25.5-minute video tape with an African American man as the primary presenter of HIV/AIDs related information (HIV risk behaviors, transmission, and HIV testing). Although the presenter was of the same ethnic group,

the content in this message condition was not tailored. The goal of this condition was to simply provide information about HIV/AIDS. *Condition two* was a gender-ethnicity-matched condition. The video presented in this condition was identical to the video in condition one, however the primary presenter of the information was delivered by an African American woman. The setting was also different as the woman speaking during the video was in an office setting. *Condition three* was an ethnically-matched message framing condition (loss-framed). This condition included the same information as the previous two conditions but emphasized cultural and personal losses that could result from not getting tested for HIV. Footage in this condition included African American women, families, and couples. Footage also included two HIV positive African American women discussing the losses they would have experienced if they had not received HIV testing when they did. For example, one of the women stated, "If I would not have been tested I don't think I would be as healthy as I am now, because not being tested would mean not knowing if I had it or not. I wouldn't have been taking better care of myself like I do now." Data were collected at three time points across the three study arms: baseline, post-test immediately following message exposure, and at the two week follow up (93% retention). For all conditions the videos were approximately the same length (25 minutes long). Findings revealed that women in the gender-ethnicity-matched condition reported significantly greater HIV test intentions compared to the women in the other two conditions at post-test. However, women in the content-framing group were more likely to report being tested for HIV at the two week follow up period (63%), compared to the gender-ethnicity-matched condition (23%) and the ethnicity-matched condition (0%). These findings demonstrate how gender-ethnicity matched messages can be effective in increasing HIV test intentions. In addition, findings point to the

importance of cultural and personal framed HIV testing messages in increasing HIV test behaviors.

The second message framing study (Apanovitch, McCarthy, and Salovey, 2003) tested the effect of loss or gain framed messages on HIV test behavior. This study's goal was to test how women's perceptions of "knowing" the outcome of their HIV test (if they were to take one) would moderate the impact of a gain or loss framed HIV testing video message on future HIV test behavior. The sample included 531 mostly African American women (66%) from local housing developments and community health centers. Participants were randomly assigned to one of four videotape conditions. This study included two gain-framed and two loss-framed video messages to control for operationalization differences in message framing. The manipulated aspects of the messages were valence (desirable vs. undesirable) and action (attain vs. not attain). For example, of the two gain-framed messages, one was worded to emphasize the benefits to obtaining a desirable outcome and the other was worded to emphasize the benefits of *avoiding* an undesirable outcome. Of the two loss-framed messages, one was worded to emphasize the attainment of an undesirable outcome, and the other was worded to emphasize *failure to obtain* a desirable outcome. Prior to the finalization of the message, a team of 6 experts including members of the target population reviewed each videotape. Message content was identical across all 4 conditions, except for differences in framing of the content. All the videos discussed the importance of HIV testing and associated desirable/undesirable outcomes of being tested for HIV or not being tested for HIV. Data were collected via face-to-face interviews before and after the viewing of the video, and then again at 3, 6, and 9 month follow up intervals via phone and/or in person. Findings revealed that at six month follow up, over one third (38%) of women in the gain-framed conditions reported testing for HIV compared to approximately one

quarter (26%) of women in the loss-framed conditions. Women who perceived HIV testing to be risky and/or were uncertain of the outcome of the test at baseline, were more likely to get tested at 6 month follow up if they had viewed a gain-framed message (although this difference was not significant). Overall women who thought they were at low risk for infection were significantly more likely to get tested for HIV during the follow up period if they viewed a gain-framed message. There were no statistically significant differences in HIV testing by message group for women who believed they were at higher risk for HIV. However, trends indicated a higher percentage of women in this group received HIV testing if they viewed the loss framed message. This study underscores important considerations in message framing for African American women to get tested depending upon their perceived risk of infection.

In a third study, Hawk (2013) developed and tested The Girlfriends Projects (TGP). TGP is a pilot sexual health intervention designed to decrease HIV risk behaviors and promote HIV testing among African American women. Participants (N =1249) were recruited through social networks, in which women received compensation to host parties at their home or another location for other African American women in their social networks. Trained facilitators discussed HIV risk information to participants and provided onsite oral HIV testing and counseling. The parties lasted for two hours on average. Follow-up HIV testing results were provided to participants two weeks after the intervention in the same place that the intervention was held, or in another secure location as selected by the participant. Findings revealed that 87% of women agreed to be tested for HIV following the intervention and 100% returned for their results (two were positive and linked to care). Other findings showed increased HIV knowledge and increased reports of condom use during vaginal and anal sex. Fewer women following the intervention reported never having talked to family members or sexual partners about HIV risk

reduction compared to reports at baseline. The fact that 87% of the women agreed to be tested for HIV suggests social and peer norms can have a positive influence on willingness to get tested, as the parties were hosted by a member of their social network.

A fourth study examined preferences for receiving HIV testing messages among African Americans adults. This study was conducted in response to the CDC's recommendation that adults receive routine HIV testing and a national survey indicating that most African Americans surveyed were interested in receiving HIV testing information. Data were collected from the waiting room of a local community health center between October 2010 and March 2011 from 176 African Americans. Study participants were predominantly female. Participants completed a simple paper survey with a few questions indicating their ranked preferences for media channels delivering HIV testing messages. Participants were also surveyed on questions concerning their preferences for who should deliver the message. Key findings revealed that the top three rated channels for HIV test messages were television, poster, and brochure. The top three rated spokespersons were a doctor, a nurse, and a "real person like me." Findings suggest that persons who are viewed as credible sources of health information may be preferred in HIV test messages. HIV test messages that feature a person who is similar and relatable to the target population may also be effective in communicating persuasive HIV test messages. The top preference for messages to be delivered via television is consistent with previous research indicating that African Americans consume more television than members of other racial/ethnic groups. This article represents one of the first studies to survey African Americans on their preferences regarding the channels of HIV test messages in addition to preferences for spokespersons delivering these messages. Knowledge of which channels to deliver messages and preferences

for spokespersons of HIV testing message may help ensure that HIV prevention efforts are focused and cost-effective.

HIV Testing and Risk Factors During Period of Emerging Adulthood

A discussion of HIV testing should consider the development period in which HIV risk factors are the highest. For example, young adults ages 18-24 have the highest rates of HIV transmission. One explanation is that young adults in this age range are emerging adults, who are in the process of transitioning into full adulthood. Emerging adulthood is a developmental stage that includes young adults ages 18-25, who are likely childless and who may be still financially dependent on others (Arnett, 2000). There is a strong desire to pursue a variety of novel experiences, especially before marriage or having children. The brain is not fully developed at this stage, several connections and structures in the brain are still developing and being strengthened. Complex cognitive changes are underway as emerging adults attempt to gain a better sense of self. Given that the brain is still maturing, this developmental period is often characterized by underdeveloped decision-making ability, sexual exploration, and feelings of being invincible (Arnett, 2000).

Feelings of invincibility may explain why emerging adults have a low perceived risk of HIV infection. The most common reason young adults report not testing for HIV is low perception of risk (Moore, 2013; CDC, 2015a). Low rates of testing may possibly explain the high rate of undiagnosed HIV infection in this population (CDC, 2016b), as individuals with a higher perception of risk are more likely to be tested (Thomas et al., 2008). Emerging adults also report increased feelings of impulsivity and engage in sensation seeking (desire for new experiences), which may explain their underdeveloped decision-making skills and engagement in HIV risk behaviors (Arnett, 2000).

HIV Risk Factors and HIV Testing Among African American Women

A discussion of HIV should also consider risk factors for HIV infection that may in turn influence HIV testing rates. Little research has examined factors that influence HIV testing among African American women; much of research among this population has focused on sexual risk behaviors in HIV prevention.

However, disproportionate rates of HIV infection among African American women are not explained by differences in sexual behavior. Research shows that young African American women do not engage in risky sexual behavior at higher rates than women of other racial ethnic groups (Buhi, Marhefka, & Hoban, 2010). In fact, some research suggests that African American women engage in safer sex practices at higher rates in comparison to women of other racial/ethnic groups. These practices include being more likely to use condoms during sex, to be tested for HIV, or to ask their partners about their HIV status (Buhi, Marhefka, & Hoban, 2010). Given that disparities in HIV infection are not explained by differences in sexual behavior (e.g., not using a condom during sex), understanding and eliminating disparities in HIV infection among African American women requires a thorough examination of non-sexual behavior risk factors that place African American women at increased risk for HIV infection.

Socio-contextual factors, some of which are discussed below, must be incorporated into HIV prevention efforts to increase their effectiveness. In other words, HIV prevention efforts that go beyond the sexual behavior level — interventions that consider and incorporate socio-contextual factors of HIV risk — are needed to adequately address and eliminate HIV infection disparities among African American women. Understanding socio-contextual factors of HIV risk among African American women, can also be used to understand HIV protective factors, barriers

to testing, and factors that influence decisions regarding HIV test seeking, beliefs about HIV testing, and/or routine HIV test taking.

Existing High Rates of HIV Infection (Community Exposure). High rates of HIV infection in a community or social network places individuals within that community or network at higher risk of encountering the HIV virus. African American men and women have the highest burden of HIV infection among all racial/ethnic groups in the United States. Despite comprising only 13% of the U.S. population, they represent 43% of all new HIV diagnoses and have the highest rate of HIV infection among all racial/ethnic groups (CDC, 2019c). Individuals are more likely to have sexual relationships with members of the same racial/ethnic group (CDC, 2016a). Thus, existing high rates of HIV infection in the African American community put African American women at a greater risk of infection with each new sexual partner compared to women of other racial/ethnic groups. Consequently, even though African American women engage in risky sexual behavior at comparable rates (or lower) then women of other racial/ethnic groups (Buhi, Marhefka, & Hoban, 2010), they remain at higher risk for HIV with each new sexual encounter. Knowledge of existing high rates of HIV infection may partially explain higher rates of HIV testing among African American adults and may also encourage young African American women previously unaware of this statistic to get tested for HIV.

Gender Ratio Imbalances and High-Risk Heterosexual Contact. Gender ratio (or sex ratio) imbalances in the African American community are an additional potential explanation as to why African American women are at increased risk for HIV infection, as this imbalance increases the likelihood of an African American women encountering a high-risk sexual partner. Currently, the gender ratio imbalance among African Americans is such that there are 91.4 Black men to every 100 Black women (US Census Bureau, 2011). Higher rates of mortality and

incarceration partially explain the existence of this gender ratio imbalance. Gender ratio imbalances can influence HIV risk of heterosexual African American women, given that there are fewer male partners for each woman — a situation which can create a dating environment that favors heterosexual men, leaving women with a lower ability to negotiate in sexual situations if they want male sexual partner.

Perceptions of gender ratio imbalances are just as important as actual proportions of gender ratios in terms of influencing HIV risk and sexual networking patterns (Ferguson, Quinn, Eng, & Sandelowski, 2006). Gender ratio imbalance beliefs refers to an individual woman's assessment of the percentage of eligible male partners there are for a heterosexual woman within her specific community or social network (Ferguson, Quinn, Eng, & Sandelowski, 2006; Lanier, 2013; Stevens-Watkins, Knighton, Mitchell, Oser, & Leukefeld, 2013).

High risk heterosexual contact is the primary source of HIV transmission among women, as it accounts for 91% of HIV transmissions (CDC, 2016c). The CDC indicates that one reason for high rates of HIV infection among African American women is that they are more likely to encounter high risk male sexual partners. Sexual risk factors of one's sexual partner are just as likely to influence one's transmission risk as one's own sexual risk behaviors. For example, if a woman engages in low risk sexual behavior but has a partner who engages in high risk sexual behavior, she is still exposed to the consequences of her high-risk sexual partner's behavior. This not only increase a women's risk for HIV infection, but also her risk for other STIs as well. Increased awareness of high-risk heterosexual contact risk factors and the influence of gender ratio imbalances on HIV risk may act as a protective factor in HIV prevention in increasing HIV testing rates.

Gender Role Beliefs. Gender role beliefs — internalized socially constructed ideals about appropriate behaviors, activities, practices, and responsibilities according to one's gender group — have an important role in HIV risk (McHugh & Frieze, 1997; Tenebaum & Leaper, 2002). Gender role beliefs can determine who is responsible for decision making about safer sex practices in romantic and sexual relationships (Amaro, Raj, & Reed, 2001; McHugh & Freize, 1997). While gender roles are often thought of as being exclusively feminine or masculine, most African American women have androgynous gender role beliefs, valuing both feminine and masculine traits (Ashcraft & Belgrave, 2005; Binion, 1990; Belgrave & Allison, 2013). Differences in social, economic, and historical factors (e.g., racism, discrimination, etc.) resulted in African American women taking on more traditionally male responsibilities (e.g., being the head of a household in absence of a male presence). Thus, African American women have developed a complex gender role identity, which differs from the traditionally feminine gender role identity held by women of other racial/ethnic groups.

While African American women hold androgynous gender role beliefs in most aspects of their lives, research suggests that they maintain traditional feminine gender role beliefs in their romantic and sexual relationships (Binion, 1990; Fullilove, Fullilove III Haynes, & Gross, 1990; Jones & Shorter-Gooden, 2003). Traditionally feminine gender role beliefs are associated with deference to males in sexual decision-making situations (Amaro et al., 2001; Wingood & DiClemente, 2000). Thus, if a woman has a sexual partner who does not want to engage in safe sex practices, she is likely to follow the male's lead. Consequently, women who hold traditional gender role beliefs in their romantic relationships are at greater risk for HIV infection. African American women higher who score high on scales measuring traditional gender role beliefs, may

be less liked to get tested for HIV if they put the wellbeing of others before their own. She may also be less likely to ask her partner to get tested.

Sexually Transmitted Infections. In addition to high rates of HIV infection, African American women also have higher rates of STIs compared to their racial/ethnic counterparts. African American women have higher rates of chlamydia (5.7 times that of white women), gonorrhea (10.7 times that of white women), and syphilis (9.2 times that of white women) (CDC, 2016c). Rates of STI infection directly impact HIV risk, as the presence of a STI during exposure to HIV during unprotected sex can facilitate the transmission of HIV by allowing the virus faster entry into the immune system (CDC, 2010). Persons who have a current STI during exposure to HIV are 2 to 5 times more likely to become infected with HIV during exposure compared to persons who are STI negative (CDC, 2010). The increased likelihood of HIV transmission among persons infected with an STI may be explained by inflammation and small tears/breaks in the skin and other damage that STIs may cause. In addition, HIV positive persons who have a concurrent STI infection (for example, a person infected with HIV and syphilis) are more infectious and thus more likely to transmit the virus (CDC, 2010). Being HIV positive and having a concurrent STI is linked with having higher concentrations of HIV in vaginal fluids, semen, and other genital and other secretions which enable the virus to spread more easily (CDC, 2010). The presence of an STI may be related to higher levels of HIV testing, if women are offered concurrent HIV testing during other STI testing.

HIV Conspiracy Theories. While the origin of the HIV virus remains definitively unknown, many scientists support the theory that HIV was derived from simian immunodeficiency viruses (SIVs) (Bailes, et al., 2003; Keele et al., 2006). This theory states that SIV in West African primates mutated into HIV and crossed species to infect humans; a theory

which is opposed by many within the African American community (Bogart & Thorburn, 2005; Klonoff & Landrine 1999). Beliefs that differ from the official accepted origin of HIV are referred to by research scholars as "HIV conspiracy theories." There are two primary types of HIV-related conspiracy theories, benign-neglect and malicious-intent. Supporters of benign-neglect conspiracy theories believe that the government is not doing enough to reduce HIV disparities among African American people. Many supporters of this theory also believe that the government is withholding a cure for HIV from the African American community. Most supporters of HIV conspiracy theories believe in benign-neglect theories. Those who believe in malicious-intent conspiracy theories, believe that the government deliberately created HIV as a secret form of Black genocide, and that the government is trying to eliminate the African American community (Klonoff & Landrine 1999). HIV conspiracy theory beliefs likely result from knowledge of past wrongdoings in medical research by the government, such as the Guatemala and Tuskegee experiments in which participants were purposefully infected with venereal diseases and intentionally withheld treatment for their infections (Jones, 1992). HIV conspiracy theory beliefs, both malicious and benign, may increase HIV risk and decrease likelihood of HIV testing if an individual believe that their HIV risk is a result of a secret government plot that they can't do anything about (Bogart & Thorburn, 2005). Non-supporters of HIV conspiracy theory beliefs may be more likely to engage in HIV prevention behaviors, and thereby less likely to transmit HIV.

Safer Sex Interventions are not Sufficient in Reducing HIV Transmissions

Safer sex interventions promoting skill building have been largely utilized in combatting HIV infection transmission rates, through educating individuals about protective sexual behaviors (CDC, 2015b). This approach is not sufficient, as interventions focused on promoting

safer sex behavior alone are limited in scope and effectiveness for several reasons. One, African American young adults don't engage in more sexual risk behavior than those of other racial/ethnic groups (Buhi, Marhefka, & Hoban, 2010). In fact, some studies show that they engage in more HIV protective behaviors such as being more likely to use condoms during oral, vaginal, and anal sex (Buhi, Marhefka, & Hoban, 2010). Two, African Americans are at increased risk for infection with each new sexual encounter by the sheer fact that there is a higher rate of HIV infection in this population (CDC, 2015a). Thus, when African Americans engage in the same level of protective behavior as other groups, they are still at higher HIV risk. Three, HIV prevention efforts need to move beyond intervening at the sexual risk level, as HIV infection rates among African Americans remain high. While safer sex interventions have demonstrated some effectiveness, interventions specifically promoting HIV testing need to be implemented to account for the weaknesses of interventions focused on sexual risk behavior alone. Studies examining HIV testing among young adults have called for the need of future studies to develop culturally sensitive HIV testing message for young African American adults, in such a way that addresses non-traditional risk factors (e.g., HIV conspiracy theories), in addition to traditional risk factors such as sexual risk behaviors (Hall, Walker, Shah, & Belle, 2012). Of the research focused on African American young adults exclusively, most have focused on sexual behavior alone (Thomas et al., 2008).

Theoretical Framework

The Health Belief Model. The Health Belief Model (HBM) was utilized as the primary theoretical framework in guiding this research. The HBM is used to predict preventative health behaviors from belief patterns (Janz & Becker, 1984). There are five primary components: perceived susceptibility, perceived seriousness, perceived benefits of talking action, barriers to

taking action, and cues to action. Perceived susceptibility refers to an individual's perception of the likelihood that they would develop an adverse health condition. For example, women who have a higher perceived susceptibility of HIV infection will be more likely to engage in safer sex behavior and/or get tested for HIV. Perceived seriousness refers to the perception of negativity a disease could cause (e.g., pain, discomfort, etc.). Similar to perceived susceptibility, women who perceive HIV infection to have serious negative consequences will be more likely to engage in safer sex behavior and/or get tested for HIV. Perceived benefits of taking action refer to the positive outcomes an individual anticipates if they were to engage in a preventative health behavior. For example, if a woman believes there are several benefits associated with getting tested for HIV, the more inclined she will be to get tested for HIV. Barriers to taking action refers to factors that prevent an individual from engaging in a preventative health behavior, even if they believe the behavior would be advantageous. If a woman perceives fewer barriers to HIV testing, she will be more likely to do so. Cues to action refer to internal and external factors that motivate one to engage in a preventative health behavior. Cues to action could take place in the form of witnessing a friend/family member getting tested, viewing HIV testing message on TV or social media, having symptoms of HIV testing, or being prompted to get tested by a health care provider. Individuals presented with cues to get tested are more likely to do so.

Several studies have used the HBM to predict HIV risk behaviors and HIV testing (Dorr, Krueckeberg, Strathman, & Wood, 1999; Downing-Matibag & Geisinger, 2009; Schnall, Rojas, & Travers, 2015; Tarkang & Zotor, 2015; Winfield & Whaley, 2002). A study by Winfield and Whaley (2002) conducted among African American college students tested the core components of the HBM and found that perceived barriers predicted condom use. This study also reiterated the fact that knowledge of HIV infection risk behaviors alone is not sufficient in predicting

engagement in HIV preventative behaviors (Winfield & Whaley, 2002). Results from another study using the HBM to predict HIV testing found significant differences in perceived benefits and barriers among a sample of individuals at a health clinic who were presenting for testing and those who were at the clinic for other services (Dorr, Krueckeberg, Strathman, & Wood, 1999). Those seeking testing perceived greater benefits and fewer barriers to testing than those who had never been tested. The HBM was chosen as a theoretical framework in guiding the proposed study and the development of HIV testing messages, given its historical use and focus on preventative health behaviors (Tarkang & Zotor, 2015).

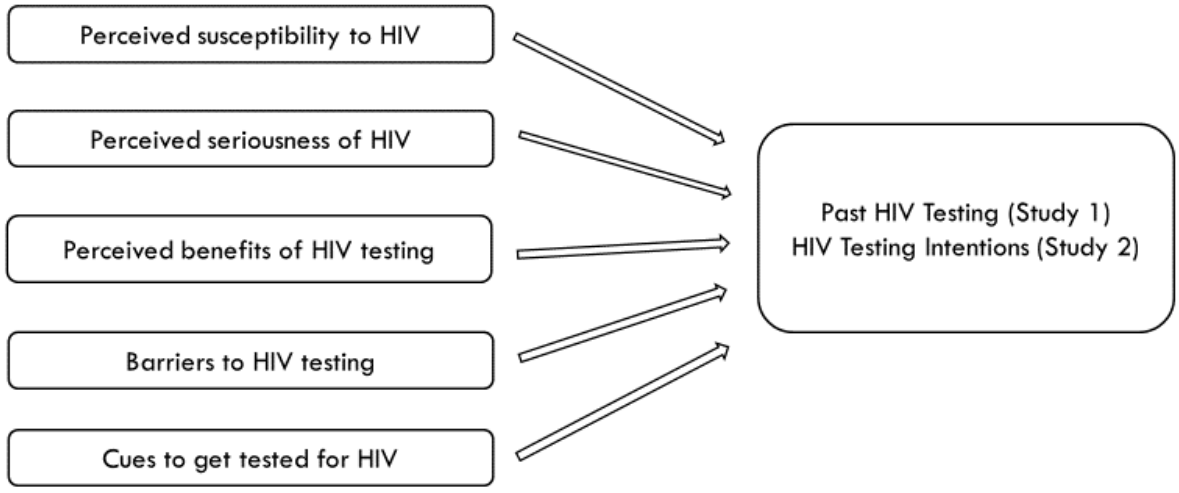

Figure 1. Health Belief Model and HIV Testing.

Statement of the Problem

African American women represent 2 out of every 3 cases of HIV among women in the United States. While safer sex interventions have been largely utilized to target individual-level sexual risk behavior in reducing new HIV transmissions, these interventions are limited in scope and effectiveness. African American young adult women have high rates of new and undiagnosed HIV infection. Undiagnosed HIV infections are a serious impediment to HIV

prevention goals, as over half of new HIV infections among young adults result from individuals uninformed of their positive HIV status *unknowingly* passing on the virus. Receiving an HIV test is the only way to be knowledgeable of one's HIV status. HIV-positive individuals who know their status are less likely to transmit the virus through unprotected sex, more likely to have their partner use PrEP, and are more likely to be less infectious after being linked to care. Thus, increased HIV testing as an HIV prevention strategy is needed to reduce rates of new transmissions. Despite the benefits of HIV testing, limited research has examined mechanisms to increase HIV testing among young African American women. Additionally, few studies have examined barriers and facilitators related to HIV testing. The specific goals of this research are to: 1) identify barriers and facilitators related to HIV testing among African American women ages 18-24 and 2) develop a culturally tailored health message about HIV testing and to test its influence on HIV test intentions among this population.

Two studies were conducted to address the goals of this study. Study 1 answered the following research questions:

Research Question 1: What factors are associated with greater odds of past HIV testing among young African American women?

Research Question 2: What factors are associated with increased HIV test intentions among young African American women?

Study 1 also tested the following hypotheses:

Hypothesis 1: Women who report lower HIV conspiracy theory beliefs, will be more likely to have been tested for HIV.

Hypothesis 2: Women who endorse less caretaking (traditional) gender role beliefs will be more likely to have been tested for HIV.

Hypothesis 3: Women who report lower HIV conspiracy theory beliefs, will report higher HIV test intentions in the next 3 months.

Hypothesis 4: Women who endorse less caretaking (traditional) gender role beliefs will report higher HIV test intentions in the next 3 months.

Study 2 answered the following research question:

Research Question 1: Will a culturally tailored HIV testing message be more effective in increasing HIV test intentions compared to generic message?

Study 2 tested the following hypotheses.

Hypothesis 1: Women in the culturally tailored HIV testing message condition will have higher rates of HIV test intentions compared to participants in the generic message condition.

Hypothesis 2: Women in the culturally tailored message condition will rate the HIV test message as more acceptable than participants in the generic condition at post-test.

Study 1: Approach and Method

The proposed research was comprised of two studies and a health message development phase. Study 1 was a quantitative online study using a cross sectional design. The objective of this study was to identify predictors of past HIV testing and future HIV test intentions among young African American women. Following prescreening and informed consent, self-report data were collected from African American women using the following measures: HIV test intentions, HIV test behaviors, sexual risk behaviors, gender beliefs, HIV conspiracy theories, preferences for the communication of HIV testing messages, sexual behavior, social desirability, and demographics. Study 1 data was utilized to inform the content/delivery of the tailored and generic health messages developed and tested in Study 2's intervention.

Participants. Study 1 participants were young African American women (N = 109). *Inclusion criteria* required all participants to self-identify as an unmarried Black or African American woman between the ages of 18-24. Women between the ages of 18-24 were recruited given the increased risk for HIV infection and the high number of undiagnosed HIV infections among this age group. *Exclusion criteria* excluded women who had never had sex (oral, vaginal, or anal), women who were HIV positive, and those who are married, pregnant, or attempting to become pregnant. Women who have never had sex were excluded given their low risk for HIV infection.

Recruitment. The original recruitment plan included the utilization of Amazon Mechanical Turk (Mturk) as the primary method of recruitment. Mturk is a crowdsourcing website that has increased in popularity among social and behavioral research scientists in the past years as an efficient and low-cost method of quality data collection. Past research had supported Mturk as a data collection platform that provides researchers access to diverse samples of participants (Kwang, & Gosling, 2011). Past research has also found that Mturk participants perform better on measures of attention checks compared to participant data collected via traditional methods (Hauser & Schwarz, 2016). Research also supports Mturk data as being of high quality (Azzam & Jacobson, 2013), demonstrating good psychometric properties (Berinsky, Huber, & Lenz, 2012; Shapiro, Chandler, & Mueller, 2013). For these reasons, this platform was originally chosen as an ideal data collection platform.

Despite past research supporting this platform as a promising data collection platform for diverse samples, initial data collection recruitment efforts using Mturk demonstrated that this platform was not a viable data collection method. Eligibility criteria for the target population of Studies 1 and 2 of were for participants to self-identify as: female, African American or Black,

be between the ages of 18-24, have a single marital status, not be pregnant or attempting to become pregnant, and have previous sexual experience. Contrary to studies that have supported Mturk as a viable recruitment strategy for diverse populations, the percentage of Black participants that completed the prescreener were far below national averages.

Of the 436 persons who completed prescreening, only 6% reporting identifying as Black or African American. This figure is well below what would be expected, given that U.S. census data indicates that Black or African American persons make up between 12-14% of the population (CDC, 2016a). The percentage was also lower than other studies that have shown that Mturk participants reflect national racial distributions (Berinsky, Huber, & Lenz, 2011; Buhrmester, Kwang, & Gosling, 2011). Second, the overwhelming majority of individuals who completed the prescreening survey were aged 25 or older. Only 6% of participants who completed the prescreening survey met eligibility criteria in terms of age. As such, 94% of participants were ineligible based on age alone. Third, of the 436 persons screened, only three persons met Study 1 eligibility criteria. The total eligibility rate of participants screened through Mturk was 0.6%. Moreover, of the 3 eligible persons, only two agreed to participate in Study 1. Thus, the rate of participants *successfully recruited* through Mturk has was only 0.4% of all persons screened.

Given the recruitment challenges, the recruitment strategy was modified to recruit participants via convenience and snowball sampling strategies (Etikan, Musa, & Alkassim, 2016). Participants were recruited at two universities in the following departments: psychology, Africana studies, women's studies, and health sciences. Participants were also recruited from student groups and on campus organizations and sororities (e.g., Alpha Kappa Alpha Sorority, Delta Sigma Theta Sorority, and Zeta Phi Beta Sorority) whose members were majority Black or

African American and female. Additional recruitment locations included: community organizations, community centers, organizations with African American women members, listservs, websites, social media pages (Facebook, Twitter, and Instagram) that primary have Black/African American viewership, and via word of mouth.

Screening and Procedure. Participants completed all study questionnaires via Qualtrics. Qualtrics is a secure online platform for survey and data collection. Once individuals accessed the online survey, they completed a short prescreening questionnaire to determine their eligibility. The prescreening determined if participants met the eligibility criteria outlined in the participants section. Once eligible participants indicated they were interested in participating, they read an online consent form specifying details of the study and the types of questions they would be asked. Participants were informed they were free to stop participation at any time or skip any questions they did not feel comfortable answering. Questionnaires were estimated to take approximately 20-25 minutes to complete and participants were informed that they would have the option to enter a gift card drawing for one of 5 prizes (one $200 gift card, and four $100 gift cards). Participants had the option to choose between gift cards from Target, Walmart, Starbucks, Barnes and Nobles, iTunes and Amazon. Participants who consented to participate in the study were then presented with the study measures. A total of 271 individuals accessed the survey, and a total of 109 met eligibility criteria to participate in the full survey. Reasons for participants not being qualified to participate included: identifying as male, not identifying as Black or African American, being pregnant or attempting to become pregnant, being outside of the 18-24 year-old age group, and reporting no previous sexual experience.

Following data collection from Study 1, 5 participants were selected for a gift card prize utilizing an online number randomizer that randomly selected numbers ranging from 1-271.

Random number selections were initiated until 5 participants that completed the survey and provided contact information for gift cards were selected. All participants selected for a gift card chose an Amazon gift card. All gift cards codes were sent via email and receipt of each gift card was confirmed by the participant.

Measures. Below is a description of the measures used for Study 1. Participants had the option to skip any questions (with the exception of the questions used to determine their eligibility) that they did not feel comfortable answering. Participants also had the option to stop participation at any time or to withdraw their survey at the end of the study.

HIV Testing Behavior. Participants were asked if they have ever been tested for HIV (response options included no, yes, and I don't know). They were asked the number of times they were tested, the approximate date of their last test (month and year), and the location of their most recent test (e.g., health fair, doctor's office, etc.). A checklist was provided for participants to indicate the location of their most recent test. Last, participants were asked how important they thought HIV testing was on a scale of 1 to 5, with 1= Not at all important and 5 = Extremely important.

HIV Test Intentions. HIV test intentions were measured through two items. Participants were asked "I plan/will/intend to get tested for HIV/AIDS in the next 3 months." Response options were yes/no. Participants were also asked: "How likely are you to receive an HIV test within the next 3 months?" Response options ranged from 1-7, with 1 = Definitely won't and 7 = Definitely will.

Reasons for Testing/Reasons for Never Testing. If previously tested, participants were asked to report the reasons (cues to action) associated with their most recent HIV test. A list of potential reasons were provided for participants (e.g., new sexual partner, HIV symptoms, to

know your status, blood donation, etc.). Participants were instructed to indicate to what extent each reason influenced their decision to get tested for HIV. Responses were rated on a 5-point scale, ranging from 1 = not at all influential to 5 = extremely influential. Participants were also asked to indicate the primary or most important reason why they last tested. There was a space for participants to enter responses not listed as an option. If never tested, participants were asked to report reasons for never testing (barriers). A few of the options included: not wanting to know your status, not knowing where to get tested and low perception of risk. Participants again rated to what extent each reason influenced their decision not to get tested and a space was provided for participants to enter additional other reasons not listed. Participants were also asked to indicate the primary or most important reason why they had never been tested for HIV.

HIV Testing Beliefs (Perceived Importance). Participants were asked to respond to the following question regarding their beliefs about the importance of getting tested for HIV: In your opinion, how important is HIV testing? Responses were rated on a 5-point Likert scale (1 = Not at all important and 5 = Extremely important).

Sexual Risk Behavior. Participants were asked the following questions concerning the past 12 months: if they have had oral, vaginal, or anal sex; their frequency of condom use (response options were on a 5-point scale ranging from 1 = never to 5 = always); number of sexual partners; and whether they have been diagnosed or treated with an STI. Participants were also asked the same questions regarding lifetime sexual behavior. Last, participants were asked whether they used a condom the last time they had sex.

Brief HIV Knowledge Questionnaire (HIV-KQ-18). This 18-item questionnaire measured accurate knowledge related to HIV transmission mechanisms and behaviors that protect one against HIV transmission. Items were rated on a true/false scale, with a third option for "I don't

know". A sample item included, "Coughing and sneezing DO NOT spread HIV." This measure has high internal consistency ranging from αs= 0.75-0.89 (Carey, Schorder, Kerstin, 2002). The recoded scale that only included the dichotomous options for false = 0 and true = 1, had a scale alpha of α = 0.79.

HIV Conspiracy Theories Scale. This 14-item scale captured malign intent and benign neglect conspiracy theory beliefs, as research suggests that beliefs in HIV conspiracy theories affect HIV testing (Bogart and Thorburn, 2005). An example item is "AIDS was created by the government to control the African American population." Responses ranged from 1 = strongly disagree to 5 = strongly agree. Higher scores indicated stronger endorsement of HIV conspiracy theories. This scale has an alpha of α = 0.85. For the current study, α = 0.79.

Gender Ratio Imbalance Beliefs Scale (GRIBeliefs). The GRIBeliefs is a 10-item subscale of the Gender Ratio Imbalances and Beliefs Scale. The GRIBeliefs measures gender ratio imbalance beliefs (perceptions about the availability of eligible male partners) and how these beliefs influence sexual behaviors among African American women (Lanier, 2013). Responses range from 1 = strongly disagree to 5 = strongly agree. Higher scores on this scale indicated a greater endorsement of gender ratio imbalance beliefs. A sample item is, "If I make my man use a condom, he will go to another woman who will have sex without a condom." This scale has demonstrated strong validity and reliability, with α = 0.82. The current study had an alpha of α = 0.78.

Belgrave Gender Role Inventory (BGRI). Gender role beliefs affect behaviors in our sexual relationships, thus examining the gender role beliefs of Black women in this study was important. The BGRI is a 9-item gender role measure specifically designed to measure gender role beliefs of Black women (Belgrave, Abrams, Hood, Moore, & Nguyen, 2015). It has two

subscales. The 6-item Agency subscale describes a behavioral disposition to do what is required. A sample item is "Independent/Dependent." The Caretaking 3-item subscale describes one's perceived responsibilities in supporting and providing for the wellbeing of others. Responses are rated on a 5-point bipolar adjective scale format where each item consists of a pair of characteristics. Letters A – E are the response options, representing two extremes on the scale, and participants circle the letter that best describes where they fall between the item pair. A sample item is "A Caregiver/Not a Caregiver." The $\alpha = 0.74$ for Agency, and $\alpha = 0.81$ for Caretaking. The current study had an alpha of $\alpha = 0.67$ for Agency, and $\alpha = 0.66$ for Caretaking.

Champion's Health Belief Model Constructs Instrument. Champion's Health Belief Model Constructs Instrument is a 38-item instrument originally designed to test the Health Belief Model (HBM) with the dependent variable being frequency of breast self-exams (1984). This instrument was modified for this study to assess factors that influenced perceptions around HIV infection and HIV testing. Responses were rated from 1 = strongly disagree to 5 = strongly agree on a 5-point Likert Scale. The 6 subscales are susceptibility, seriousness, benefits, barriers, motivation (cues to action), and self-efficacy. Below is a description of the 5 subscales that were included and modified for use in the current study (Champion, 1984).

1. Susceptibility: This 5-item subscale was used to assess perceived susceptibility of HIV infection. A sample modified item included, "It is extremely likely that I will get HIV in the future." For the original subscale, $\alpha = 0.93$. In the current study with the modified item, $\alpha = 0.86$.
2. Seriousness: This 12-item subscale was used to assess the perceived seriousness of an HIV infection. A sample modified item included, "Problems I would experience if I

were HIV positive would last a long time." For the original subscale, α = 0.80. In the current study with the modified item, α = 0.75.

3. Benefits: This 5-item subscale was used to assess the perceived benefits of getting an HIV test. A sample modified item included, "When I get tested for HIV I feel good about myself." For the original subscale, α = 0.80. In the current study with the modified item, α = 0.79.
4. Barriers: This 8-item subscale was used to assess perceived barriers of getting an HIV test. A sample modified item included, "Getting tested for HIV will take too much time." For the original subscale, α = 0.88. In the current study with the modified item, α = 0.84.
5. Motivation (cues to action): This 8-item subscale was used to assess factors that would motivate someone to be tested for HIV. A sample modified item included, "I feel it is important to carry out activities which will improve my health." For the original subscale, α = 0.83. In the current study with the modified item, α = 0.79.

Format and Delivery Preference of HIV Testing Messages. Participants were given a list of potential delivery formats for the HIV testing messages. Participants were asked to rate how interested they would be in receiving information through the following health communication platforms: TV/commercial, flyer/poster, social media, online source other than social media, billboard, professional presentation, email, text message, doctor's office, health clinic, health fair, community center, university/school event, newspaper, brochure, or other (participants were asked to specify). Those selecting "other" first chose from messages delivered in person, via online or social media, via advertisement, or other, and then filled in their response. Responses were rated on a 5-point Likert scale ranging from 1 = extremely *dis*interested to 5 = extremely

interested. Those who selected social media were asked to list the specific social media platforms of interest. Participants were also asked to select the platform they were most interested in receiving information about HIV testing.

Exposure to Previous HIV test Message. Participants were asked if they have ever been exposed to an HIV testing message via the following formats: TV/commercial, flyer/poster, social media platform, an online source other than social media, billboard, professional presentation, email, text message, doctor's office, health clinic, health fair, community center, university/school event, newspaper, brochure, or other (participants were asked to specify via a fill in the blank response).

Socio-demographics. Data were collected on participant's age, gender, race, ethnicity, sexual orientation, previous education obtained, current educational level, state location, income, health insurance status, relationship status, marital status, length of current relationship/marriage, and whether participants were pregnant or attempting to become pregnant.

Social Desirability Scale (SDS). This is a 16-item scale that measured socially desirable responding (Stober, 2001). Responses were rated on a true or false scale. Higher scores indicated a tendency to answer questions in a socially favorable manner. This scale has an internal consistency of $\alpha = .72$.

Sensitivity of Data Collection. To address and minimize the potential risks associated with this study, participants were informed on the consent form and reminded at the beginning of the questionnaire that they would be asked questions related to HIV testing and sexual behaviors. The consent form indicated that participation was completely voluntary, and that they should feel free to skip any questions they do not feel comfortable answering. To guard against potential risks associated with privacy of sensitive information and discomfort disclosing sensitive

information online, participants were reminded that all data would be held strictly confidential. On the consent page, participants were informed that all data would be completely de-identified at the end of the study and stored on password secure computers only accessible by study staff. All data were de-identified following the payment of participants selected for a gift card prize.

Data Analysis Plan. All analyses were conducted using SAS Version 9.4. Prior to analysis, data were screened for missing values, normality, and all categorical variables were recoded to include zero. A multivariate binomial logistic regression model was constructed to assess the relative contribution of each predictor variable on odds of reporting a past HIV test (primary outcome). The following predictor variables were included in the model: HIV test beliefs, HIV knowledge, HIV conspiracy theories, gender ratio imbalance beliefs, gender role beliefs, number of sexual partners, and average condom use. A multivariate linear regression model assessed significant predictors of positive intentions to receive a future HIV test in the next 3 months (secondary outcome). Significant predictors of past HIV testing or positive HIV test intentions were considered for utilization in the construction of the HIV test messages in Study 2. Response frequencies were calculated for the following variables: reasons for past HIV testing, reasons for never testing, and format/delivery preference of HIV test messages. Responses with high frequencies were considered for inclusion in the construction of the test messages in Study 2.

Power analysis. A power analysis was conducted using Agresti (2007) logistic guidelines for hypothesis testing based on the multivariate logistic regression model that was constructed to examine predictors of the primary outcome (past HIV test). These guidelines state that a minimum number of 10 cases per independent variable are necessary to run a logistic regression model. To ensure that the test was adequately powered with 7 independent variables in the

model, a minimum sample size of 70 participants (10 cases per predictor) was required. To ensure a more rigorous validation and to account for the possibility of missing data, this project originally aimed to recruit a minimum of $N = 100$ participants. The final number of participants was $N = 109$. Three respondents were dropped because they agreed to participate but didn't answer any survey questions.

Data Cleaning. Missing data from variables were examined to determine if missing data were missing at random (MAR) or not (MNAR). Given that there is no statistical test to determine if data is MAR or MNAR, this decision was made on a theoretical basis by thoroughly examining the patterns of missing data. This study planned that data MAR would be ignored, and the remaining data would be simply analyzed if there was enough statistical power to do so. An analysis of the remaining missing data indicated that 24 participants (22% of the full sample of 109) did not complete the full survey. Based on a review of the pattern of missing data, a decision was made that survey fatigue was the likely cause of missing data. Given that participants were overrecruited, although there was some missing data, there was enough statistical power to analyze the remaining data.

Study 1 Results

Descriptive Analyses

Prior to performing the primary analyses of Study 1, simple statistics were computed for the study's sample on sociodemographics and primary variables of interest. Findings are summarized below.

Descriptive Statistics for demographic variables

Descriptive analyses for demographic variables and covariates were computed. These variables included: age, race/ethnicity, sexual orientation, current education level, state location, family income, health insurance, and relationship status.

Age. Eligibility criteria required that participants be between the ages of 18-24, thus all participants fell within this age range. The majority of participants (18.6%) reported that they were 22 years of age, however the distribution of ages was fairly equal across ages. This sample's age distribution was as follows: 18 years (10.47%), 19 years (15.12%), 20 years (13.95%), 21 years (16.28%), 22 years (18.6%), 23 years (13.95%), and 24 years of age (11.63%).

Race/Ethnicity. Inclusion criteria required all participants to identify as Black or African American, thus all participants were of this racial/ethnic background. Two participants (2.33% of the sample) reported also being of Hispanic origin.

Sexual Orientation. Most participants identified as being of heterosexual orientation (72.09%), followed second by those who identified as bisexual (17.44%). Seven persons indicated they were unsure of their sexual orientation (8.14%), one person identified as being gay/lesbian (1.16%), and one person selected other as their sexual orientation (1.16%).

Current Education Level. The majority of participants (59.3%) reported their current education level as "Pursuing a Bachelor's Degree".

State Location. Half of the sample (49.41%) reported living in Virginia and 18.82% reported their current location as North Carolina. The remaining participants were from: Alabama, California, Florida, Georgia, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New York, Pennsylvania, and Texas. One person stated they did not live in the United States.

Family Income. The majority (34.88%) reported that their immediate family income exceeded $70,000 per year. The rest of the participants' income were distributed as follows: $0-10,000 (9.3%), $10,001-30,000 (18.6%), $30,001-50,000 (25.58%), and $50,001-70,000 (11.64%).

Health Insurance. The majority of the sample reported having health insurance, obtained through the marketplace (44.19%) or elsewhere (44.19%). Only 11.63% didn't have health insurance.

Relationship Status. Over half of the sample reported *not* being in a relationship (51.16%). Some participants (18.6%) reported being in a casual relationship. The remaining participants reported being in a committed relationship. Of this remainder 27.91% were *not* living together and 2.33% were living together.

Social Desirability. The average score on the Social Desirability Scale was $M = 0.44$ ($SD = 0.2$). Scores ranged from 0.13 to 0.88, where "0" indicates no socially desirable responding and "1" indicates that all answers provided on this scale were in line with socially desirable responses.

Descriptive Statistics for Dependent Variables.

HIV Testing. Approximately two-thirds of women had previously been tested for HIV (66.97%). The remaining 33.03% had never been tested.

HIV Test Intentions. Most participants indicated that "yes" they planned to get tested in the next 3 months (57.69%). In response to the question, "how likely are you to get tested for HIV/AIDS in the next 3 months?" the average participant reported that they were neither unlikely nor likely ($M = 4.16$, $SD = 2.26$) to get tested for HIV in the next 3 months.

Descriptive Statistics for Independent Variables.

HIV Test Beliefs. The majority of the sample (69%) agreed that HIV testing was extremely important. Twenty-six percent said HIV testing was very important. No participants rated HIV testing as "Not at all important."

HIV Knowledge. This questionnaire measured accurate knowledge related to HIV transmission and protective behaviors, with items being rated on a true/false scale. The average percent correct on this scale was 78.6 % (*SD* = 0.18).

HIV Conspiracy Theories. The HIV Conspiracy Theories Scale was used to measure conspiracy theory beliefs related to HIV. Responses range from 1 to 5 on this scale, with higher scales indicating stronger beliefs in HIV conspiracy theories. The mean score on this scale was 2.92 (*SD* = 0.66). Scores ranged from 1.7 to 4.5.

Gender Ratio Imbalance Beliefs. The Gender Ratio Imbalance Beliefs subscale was used to measure beliefs about the perceived availability of eligible partners for Black women. Response options ranged from 1 to 5; higher scores reflected higher gender ratio imbalance beliefs. The mean score was 2.14 (*SD* = 0.58) and minimum and maximum scores ranged from 1 to 3.50.

Gender Role Beliefs. The Belgrave Gender Role Inventory was used to measure gender role beliefs. The scale contains two subscales, Agency and Caretaking. The Agency subscale was used in subsequent analyses to measure gender role beliefs. This scale was chosen as the primary measure of gender role beliefs as it presented the best measure of the two in terms of measuring both masculine and feminine traits. Higher scores on this scale are associated with increased Agency, which is a traditionally masculine trait. Lower scores on this scale are associated with decreased Agency, which is a traditionally feminine trait. Response options for this scale were from 1 to 5, and higher scores indicated a stronger sense of agency (lower traditional gender role

beliefs). The mean score was 4.26 (*SD* = 0.53), indicating that on average women reported a high sense of agency.

Number of Sexual Partners. This item measured the number of sexual partners in the past 12 months. Approximately 40% of participants reported having had 2 sexual partners in this time frame. The number of sexual partners ranged from a minimum of 1 to 10 or more.

Condom Use. Condom use was measured using a single item, with response options being "0" for those who did not use a condom during their last sexual encounter and "1" for those who did use a condom. Approximately 60% of participants reported not using a condom the last time they had sex.

Descriptive Statistics for other Variables of Interest.

Number of times tested for HIV. As previously stated, the majority of the sample had previously been tested for HIV. Of those previously tested for HIV, 27.14% had been tested once. The next highest category of those reporting previously being tested for HIV were those who had been tested 3 times (22.86%), followed by those who had been tested 2 times (15.71%) and next by who had been tested 4 times (12.86%). The remainder of those previously tested for HIV (*N* = 15) had testing totals that ranged from 5 to 10 times in total.

Locations of most recent HIV test. Exactly 50% of those who had been previously tested for HIV (*N* = 35) reported their most recent testing location as being in a private doctor's office. Approximately 27% of the sample reported their most recent testing location as being at a school or college, and about 16% reported recent testing at a family planning clinic. The remainder of the sample reported testing at a mobile and outreach community testing event (*N* = 2; 2.86%), one reported testing at their workplace, another at a blood donation event, and another reported "other" as their most recent testing location.

Frequencies for Eligibility Variables for Potential Inclusion in The Intervention Message

Three measures were included to determine reasons for being tested for HIV and preferences on where to view HIV testing messages. Response frequencies were calculated for the following variables: reasons for past HIV testing, reasons for never testing, and format/delivery preference of HIV test messages. Responses with high frequencies were considered for inclusion in the construction of the test messages in Study 2.

Summary of items influencing the decision to get tested. The item with the highest mean in influencing decisions to get tested for HIV was "to know your status" (*M* = 4.06; *SD* = 1.39). An item that moderately influenced decisions to get tested was "new sexual partner" (*M* = 3.06; *SD* = 1.67). Items that slightly to moderately influenced decisions to get tested for HIV were: new relationship (*M* = 2.54; *SD* = 1.62) and doctor recommended test (*M* = 2.36; *SD* = 1.68). Last, one item slightly influenced decisions to get tested "partner infidelity" (*M* = 1.99; *SD* = 1.50). All other items (HIV symptoms, blood donation, and injection drug use) ranged from being not at all influential to being under slightly influential.

Summary of items influencing the decision not to get tested. One item regarding the decision not to get tested, "I am at no risk or low risk for HIV" ranged between being moderately influential to very influential (*M* = 3.71; *SD* = 1.61). Items that slightly to moderately influenced decisions not to get tested were: I don't know where to get tested (*M* = 2.15; *SD* 1.31) and I'm in a monogamous relationship (*M* = 2.42; *SD* = 1.75). Most participants (91.18%) reported "I don't want to know my HIV status" as being not at all influential in their decision not to get tested for HIV. The other items (I don't want to know my HIV status, I don't have insurance coverage for testing, HIV testing is not confidential, I am afraid of getting tested for HIV, getting an HIV test

is too time consuming, and I will be negatively judged if I get an HIV test) all ranged in their average means of being not at all influential to being under slightly influential.

Most important reason for getting tested. Of those tested for HIV, the majority (65.71%) reported that they sought HIV testing simply to know their HIV status. Another 11% reported that their doctor recommended the test, and 10% reported they received testing because they had recently started a new relationship. Of the remaining of those previously tested, 7.14% ($N = 5$) reported "other" as their reason for testing. From the fill in the blank responses, 5 participants reported the following 4 reasons for testing: "starting birth control" ($N = 2$), "sexual assault", "tested positive for another STD", and "a cheating boyfriend". Three other participants reported testing due to partner infidelity, and one person reported testing due to blood donation.

Most important reason for not getting tested. Of those who had never been tested for HIV, the majority ($N = 21$; 61.76%) reported "I am at no risk or low risk for HIV" as the reason they hadn't been tested for HIV. Three participants (8.82%) reported "I don't know where to get tested" and three others reported that they were in a monogamous relationship as reasons for not testing. Two participants stated they didn't have insurance coverage for the test, one person reported that they didn't want to know their HIV status, and one stated that they were afraid of getting tested for HIV. Three participants reported "other" and fill in the blank responses were as follows: "broke, no transportation, no time", "every time there is a chance to get tested for free on campus it is not advertised well so I will miss it or see it last minute when I cannot fit it into my schedule", and "I am celibate".

Platforms interested in receiving HIV information. When asked to select which platform they would be most interested in receiving HIV test information, 30% of the sample

selected social media, 20% said at a university/school event, 19% said a doctor's office, and 8% said from a TV/commercial.

Bivariate Correlations with Independent Variables

Bivariate correlations were ran for the independent variables HIV testing beliefs, HIV knowledge, HIV conspiracy theories, gender ratio imbalance beliefs, gender role beliefs, number of sexual partners, and condom use (See Table 1). While there were no significant correlations, some of the relationships did trend toward significance.

Table 1.

Correlations among Independent Variables and Dependent Variables

Variable	1	2	3	4	5	6	7
1. HIV Testing Beliefs (Importance)	----						
2. HIV Knowledge	-0.195	----					
3. HIV Conspiracy Theories	-0.109	-0.121	----				
4. Gender Ratio Imbalance Beliefs	0.143	-0.001	0.205	----			
5. Gender Role Beliefs (Agency)	-0.161	0.104	0.184	-0.026	----		
6. Number of Sexual Partners	-0.122	0.196	-0.038	-0.036	-0.053	----	
7. Condom Use	-0.023	0.118	-0.195	-0.123	0.017	0.12	----

* Correlation is significant at or below the .05 level (2 tailed)
** Correlation is significant at or below the .01 level (2 tailed)

Research Questions and Hypothesis testing

Research Question 1 and Hypotheses 1 & 2: The following research question and hypotheses were tested in a logistic regression model to determine which factors were associated with HIV testing.

R1: What factors are associated with greater odds of past HIV testing among young African American women?

H1: Women who report lower conspiracy theory beliefs, will be more likely to have been tested for HIV.

H2: Women who endorse less caretaking (traditional) gender role beliefs will be more likely to have been tested for HIV.

To answer research question 1 and hypotheses 1 and 2, a multiple logistic regression model was constructed. In the first regression model, the following independent variables were entered into the model: HIV test beliefs, HIV knowledge, HIV conspiracy theories, gender ratio imbalance beliefs, gender role beliefs, number of sexual partners, and average condom use. This model revealed that number of sexual partners was a significant predictor of past HIV testing; women who had more sexual partners were significantly more likely to have been tested for HIV (OR = 1.804; CI: 1.377-2.365). For each unit change in the number of sexual partners reported, log odds of being tested for HIV increased by 0.5903. None of the other independent variables were significant, including the variables in the hypothesized relationships.

The second logistic regression model tested a modified version of the Health Belief Model. In the first step of the model the following variables were entered: perceived susceptibility to HIV, perceived seriousness of HIV, perceived benefits of HIV testing, barriers to HIV testing, and cues to get tested for HIV. The variable perceived benefits of HIV testing was a significant predictor of past HIV testing, $p = 0.0247$, such that those who perceived more

benefits of getting tested were more likely to have been tested for HIV (OR = 2.897; CI: 1.145-7.328). Barriers to getting tested for HIV also emerged as a significant predictor of HIV testing, $p = 0.0020$, such that barriers to getting tested were associated with women being less likely to have been tested for HIV (OR = 0.276; CI: 0.121-0.625).

Research Question 2 and Hypotheses 3 & 4: The following research question and hypotheses were tested in a multiple linear regression model to determine which factors were associated with future HIV test intentions.

R2: What factors are associated with increased HIV test intentions among young African American women?

H3: Women who report lower conspiracy theory beliefs, will report higher HIV test intentions in the next 3 months.

H4: Women who endorse less caretaking (traditional) gender role beliefs will report higher HIV test intentions in the next 3 months.

To answer research question 2 and hypotheses 3 and 4, a multiple logistic regression model was constructed. In the first regression model, the following independent variables were entered into the model: HIV test beliefs, HIV knowledge, HIV conspiracy theories, gender ratio imbalance beliefs, gender role beliefs, number of sexual partners, and average condom use. This model revealed that number of sexual partners was a significant predictor of future intentions to get tested for HIV; women who had more sexual partners reported higher intentions of getting tested for HIV in the next 3 months $t(1) = 3.51$, $p = 0.0007$, $\beta = 0.2161$. Perceived importance of HIV testing was also significantly associated with increased HIV test intentions in the next 3 months, such that women who rated HIV testing as more important reported higher intentions of getting tested for HIV in the next 3 months $t(1) = -3.57$, $p = 0.0006$, $\beta = -1.23549$.

The second multiple regression model tested a modified version of the Health Belief Model. In the first step of the model the following variables were entered: perceived susceptibility to HIV, perceived seriousness of HIV, perceived benefits of HIV testing, barriers to HIV testing, and cues to get tested for HIV. Perceived seriousness of HIV was a significant predictor of HIV test intentions, $t(1) = -3.40$, $p = 0.0010$, $\beta = -0.21656$, such that more perceived seriousness of HIV testing was significantly associated with greater intentions to get tested for HIV in the next 3 months.

Health Message Formation

Overview. The HBM was utilized as the primary theoretical framework in guiding the development of the message. Two conditions were developed as outlined below and were later tested in a randomized intervention (Study 2). Condition 1 participants were exposed to an HIV testing message inclusive of culturally tailored information that addressed both culturally specific barriers and facilitators of HIV testing (as identified in Study 1). This messaged also included factors that were significantly related to HIV testing and HIV test intentions in Study 1. Condition 2 (generic message) participants were exposed to a simple HIV educational message that consisted of general HIV statistics for women in the United States, information on how HIV is transmitted, where to get tested, and listed general benefits of getting tested. The process of developing the health message, and the components of each message condition are described below.

Methods of Health Message Development.

Health Message Development Team. To begin the process of developing an evidence-based intervention health message and a generic message for testing in Study 2's intervention, a health message development team was formed. This team consisted of five members: The

Principle Investigator (PI) of the study (Melanie Moore), an HIV intervention development consultant, a health message development consultant, a target population consultant, and a graphic designer. Several meetings were held throughout the health message development stage with team members to finalize the two message conditions in Study 2.

The HIV intervention development consultant had over 30 years of experience in developing, implementing, and evaluating HIV prevention interventions. She is an international expert on health disparities among African Americans and has implemented several large-scale HIV prevention interventions with members of this study's target population. The HIV intervention development consultant's primary role was to double check the accuracy of information included in the health message, to ensure the targeted intervention components and behavioral change strategies were included in the message, and to provide guidance on the intervention development research methods.

The health message consultant was an internationally known expert on health risk communication. He has a long-standing portfolio of research on health risk communication and has conducted several relevant studies related to the framing, persuasion, tailoring, and evaluation of health messages. Further, he had published several studies related to the promotion of preventative health screenings among women. His primary role was to provide guidance on message components being considered for inclusion in the health message, the effective evaluation of the health messages (questions to assess the message's perceived clarity, credibility, and acceptability), and best practices for increasing the message's effectiveness and making a lasting impression on participants.

The target population consultant was a research assistant who had previous experience in developing and implementing HIV educational events and who worked in the same research lab

as the PI. She was also a member of the target population, an African American woman in the 18-24-year-old age group. Her primary role was to provide guidance to the health message development team on what her peers would perceive as being important to include in a HIV testing message. She also advised the team on what not to include in terms of message components that would provoke fear, disinterested responses, prompt people not to read, or message components that may be considered stigmatizing. Her additional roles included taking notes during iteration meetings and assisting the graphic designer with the modern design of the health message.

The graphic designer was a student at Virginia Commonwealth University and also a woman in the target age group. She had past experience in international HIV prevention work and the development and marketing of health messages via social media. Her primary responsibilities included drafting the initial health message design and redrafting additional iterations of the design based on feedback from other members of the health message development team. She ensured the message was modern and attractive for young adults in the target population, and appropriate/friendly for viewing on social media.

Meetings. Prior to the message development process, the health message consultant and the PI met to discuss Study 1's significant findings and strategies for incorporating these findings into the content and format of the HIV testing messages. In the study's proposal, it was initially decided that a group of experts in HIV prevention would review the health message and provide suggestions for revision. However, the health message consultant informed the PI that having an expert review panel would have biased the health message development process. To ensure that participants' opinions were accurately reflected in the health messages developed, a decision was made against seeking an expert panel review of the health messages.

A total of 5 meetings were held to develop the health message. The format of the meetings were as follows: design consultant presented newest iteration of health message, PI and target population consultant reviewed message and made notes, notes were then given to the design consultant to utilize in the next iteration of the message. The intervention development consultant reviewed the message once it was near finalized and provided feedback. Her guidance was used to finalize the health message during the last meeting.

Overall Message Design Decisions. Based on recommendations from the health message development team, overall decisions were made about the design of the health messages. A modern font was chosen, the traditional HIV ribbon was not included on flyer for concerns about instilling fear messages, text was kept to a minimum, bullet points were used as was lots of "white space". The most important message was listed at the top of the flyer.

Overview of Information across Both Message Conditions. Both message conditions were identical in terms of flyer size, colors represented, font type and font size. Both messages also included information on where to get tested for HIV (website and phone number), and both conditions included statistics of HIV among women. Both messages were matched on type of content and images; however, what varied in the intervention condition was the cultural tailoring and the inclusion of significant findings from Study 1.

Overview of treatment components considered for inclusion in the targeted health message. Six behavioral change strategies were utilized in the intervention message condition: benefits of HIV testing, knowledge of where to get tested, HIV infection statistics, the presence of an image, a pop quiz section, and the inclusion of any significant findings from Study 1. Figure 1 contains the finalized intervention health message.

Strategy #1: Benefits of HIV testing. Culturally specific benefits of HIV testing among African American women as identified in Study 1, in addition to general benefits of testing (from the CDC's website) were listed on the flyer. Under the "Why Get Tested?" section, the following benefits were listed in bulleted form: 1) HIV+ persons who receive treatment early have the best chance at living a normal lifespan, 2) Getting tested will make you feel good about protecting yourself, and 3) HIV testing is confidential and fast (test results in as soon as 20 minutes). This strategy targeted the perceived benefits and cues to action components of the HBM.

Strategy #2: Where to get tested for HIV. A website and phone number (information taken from the CDC's website) was listed at the bottom center of the flyer. A call to action stated, "Call your doctor or healthcare provider today!" to encourage participants to get tested. A link to a zip code locater to find a testing center nearby and the number to the National HIV Testing Hotline was also listed to make participants aware of locations to get tested at. This strategy targeted the barriers and cues to action components of the HBM.

Strategy #3: HIV infection statistics. HIV infection statistics specific to African American women were included on the flyer and were taken directly from the CDC's website. The CDC's website was chosen for this information as it is perceived by most as a credible source of information. Under the "Why Get Tested" section, participants were informed of the following: 1 in 48 Black women will be diagnosed with HIV in their life time. Under the "How is HIV Spread?" section, the following bulleted points were given: Having unprotected sex (oral, vaginal, or anal); blood, precum, and semen; vaginal fluids and rectal fluids; dirty needles/sharing of needles; and breast milk and childbirth (rare). Additionally, under the "For More Info" section "cdc.gov/hiv" was given as a reference website for more information. The

flyer also mentioned that all facts and statistics were obtained from cdc.gov/hiv. This targeted the perceived susceptibility and perceived seriousness components of the HBM.

Strategy #4: Image. An image of two female vectors with brown and dark skin were displayed on the flyer. One of the women had curly brown hair, and the other woman had dark straight hair. These women were displayed on the left and right side of the pie chart indicating that 1 in every 2 young adults do not know their HIV status. This targeted perceived susceptibility and the cues to action components of the HBM.

Strategy #5: Pop Quiz. Under the "Pop Quiz" section participants were asked: "Which woman should be tested for HIV?" Response options included: a woman who's had only 1 sexual partner, a woman who's had more than 5 sexual partners, a woman in a relationship with 1 person, or a woman who has friends with benefits (casual sexual partners). The answer given was "All of the above women should be tested for HIV." Given that many participants reported that they believe they were at low risk or no risk for HIV, this pop quiz was included to convey the message that anyone having sex should be tested for HIV, irrespective of the number of sexual partners. This targeted the perceived susceptibility component of the HBM model.

Strategy #6: Study 1 Significant Findings Included in the Targeted Message. Significant findings from Study 1 revealed that among those who had been previously tested for HIV, wanting "to know your status" was the most frequently reported as being influential in their past decision to get tested. This was followed by "new sexual partner" which was noted as being moderately influential in past decisions to get tested among women who'd been previously tested for HIV. Among the group who'd never been tested for HIV, the item "I am at no risk or low risk for HIV" was very influential in their decision to never get tested, followed by the item "I'm in a monogamous relationship" which was moderately influential. Among women who had never

been tested, the item selected as the most important reason for never getting a test was "I am at no risk or low risk for HIV."

Findings from the models testing the influence of the independent variables (HIV testing beliefs, HIV knowledge, HIV conspiracy theories, gender role beliefs, gender ratio imbalance beliefs, sexual partners, and condom use) revealed that a larger number of sexual partners was a significant predictor of past HIV testing and future intentions to get tested for HIV. A greater belief in the importance of HIV testing was also significantly associated with increased future intentions to get tested. Thus, the intervention message included components that targeted these significant factors. For example, a pop quiz question included information about who should get tested for HIV based on the number of sexual partners a woman has had. The importance of HIV testing was relayed throughout the intervention message, specifically in the "Why Get Tested" section, the infographic, and the headlining message about the number of young adults with HIV that are unaware of their HIV status.

Findings from the models testing the HBM revealed that more perceived benefits of HIV testing was associated with an increased likelihood of having received a previous HIV test. More perceived barriers to HIV testing was a significant predictor of a lower likelihood of previously being tested for HIV. In addition, greater perceived seriousness of HIV was a significant predictor of increased future intentions to get tested for HIV. Thus, these significant factors related to perceived benefits and perceived seriousness of HIV was further emphasized in the "Why Get Tested" section. Perceived barriers were addressed by informing participants where they could get tested for HIV and through reminding them that HIV testing is confidential, and the process is quick. This specific information was chosen to address barriers based on the perceived barriers questions that participants responded to which indicated that concerns about

confidentiality, where to get tested, and the time that it takes to get tested were barriers to getting tested.

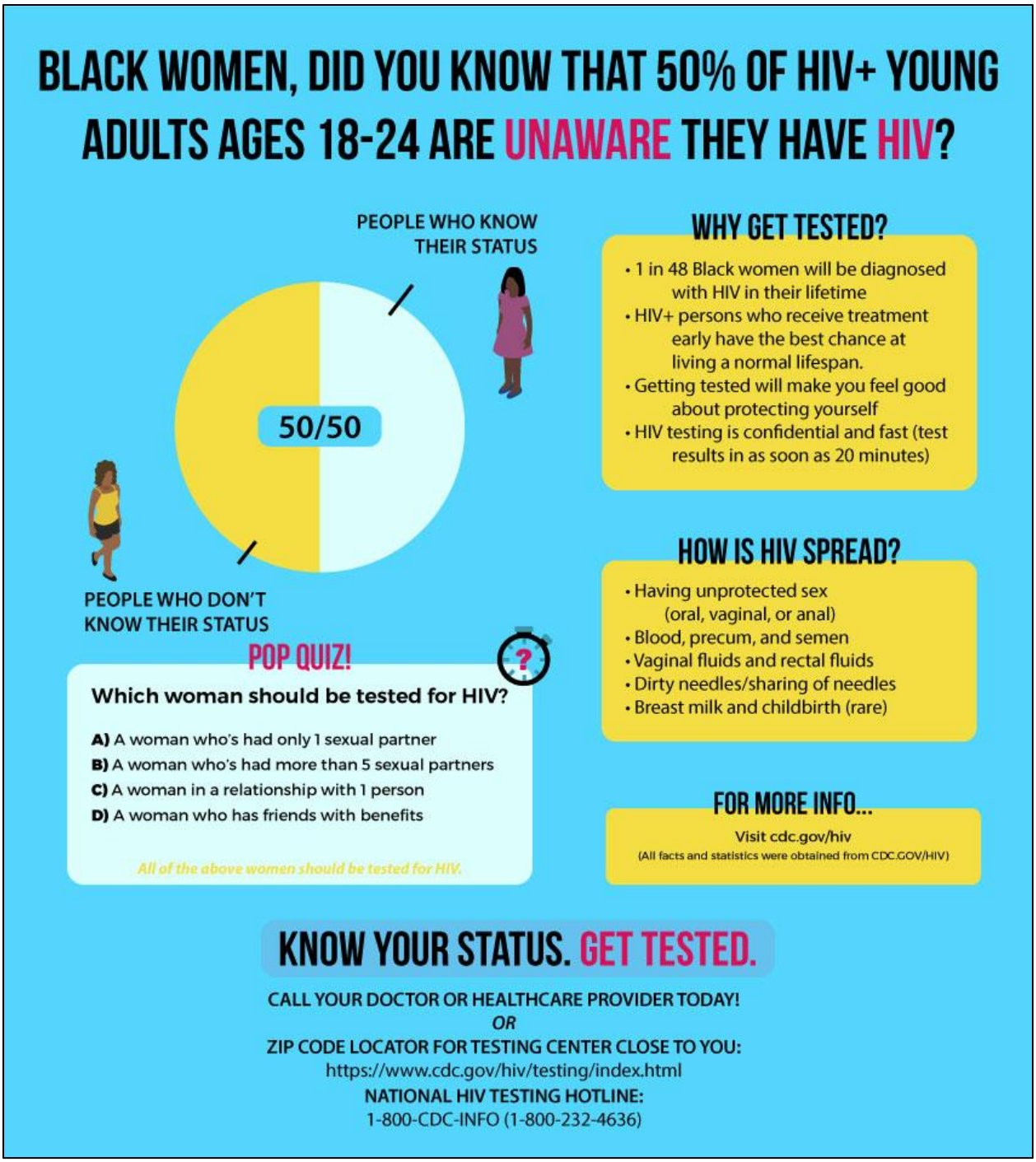

Figure 1. **Targeted Health Message Design**

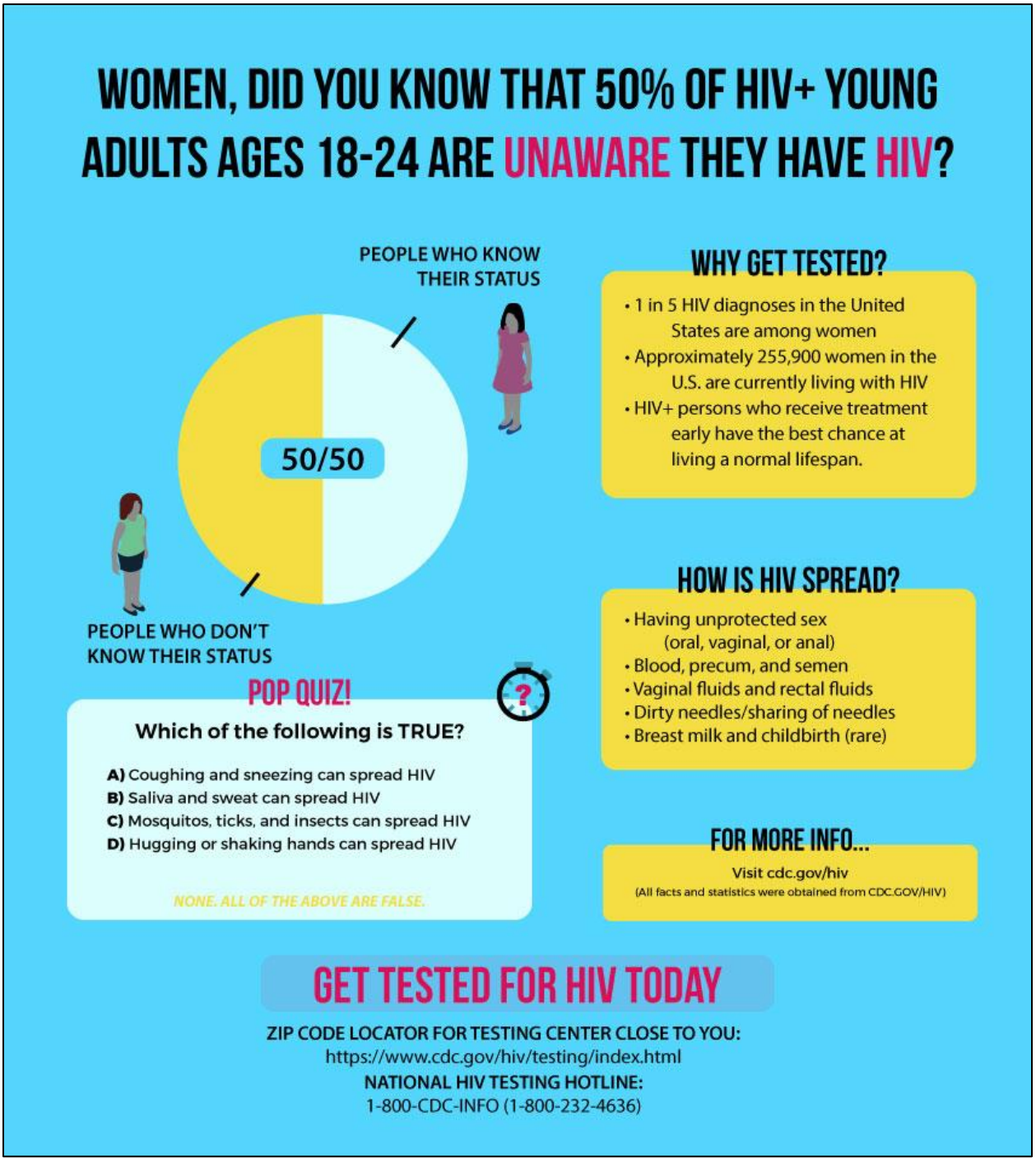

Figure 2. **Generic Health Message Design**

Overview of Components considered for inclusion in the Generic Message Condition. The generic message components were identical to those utilized in the tailored message condition; however, these components were tailored for women in general (not race/ethnicity specific). Five strategies were included in this message.

Strategy #1: Benefits of HIV testing. General benefits of testing (from the CDC's website) were listed on the flyer. This strategy was matched to the targeted component of the intervention message regarding the perceived benefits and cues to action components of the HBM. The flyer stated, "HIV+ persons who receive treatment early have the best chance at living a normal lifespan."

Strategy #2: Where to get tested for HIV. The website for a zip code locator for finding an HIV testing location and phone number for the National HIV testing Hotline was listed at the bottom center of the flyer to notify participants of where to get tested. The call to action stating, "Call your doctor or healthcare provider today!" was not listed in the generic version of the flyer. This strategy targeted the barriers and cues to action components of the HBM.

Strategy #3: HIV infection statistics. HIV infection statistics for women in general were included on the flyer and were taken directly from the CDC's website. The infection statistics for women read as follows: "1 in 5 HIV diagnoses in the United States are among women" and "Approximately 255,900 women in the U.S. are currently living with HIV". This strategy targeted the perceived susceptibility and perceived seriousness components of the HBM.

Strategy #4: Image. An image of two female vectors with racially ambiguous skin color was displayed on the flyer. Both had straight hair and the women were displayed on the left and right side of the pie chart indicating that 1 in every 2 young adults do not know their HIV status. This targeted perceived susceptibility and the cues to action components of the HBM.

Strategy #5: Pop Quiz. Under the "Pop Quiz" section participants were asked: "Which of the following is true?" Response options included: coughing and sneezing can spread HIV; saliva and sweat can spread HIV; mosquitos, ticks, and insects can spread HIV; and hugging or shaking hands can spread HIV. This targeted the perceived susceptibility component of the HBM model.

Study 2 Methods: Implementation and Evaluation of the Health Message

Design and Methods Overview. The overall objective of Study 2 was to test the exposure effect of an evidence-based and culturally-targeted HIV testing message compared to a generic testing message on HIV testing intentions among young African American women. Study 2 implemented a pilot feasibility intervention utilizing a randomized controlled design, with two groups randomly assigned to a culturally tailored or generic message condition. Data were collected pre-test, then participants were exposed to a message condition, and then data was collected again post-test after message exposure. Study data were collected online from African American women ages 18-24 (N = 130) on HIV test intentions, HIV testing behavior, and the acceptability and feasibility of the developed HIV testing messages after message exposure. The primary outcome was HIV test intentions measured at post-test following message exposure.

Participants. Participants for Study 2 included N = 130 African American women between the ages of 18-24. Inclusion and exclusion criteria were identical to that in Study 1.

Recruitment. The recruitment strategy was identical to Study 1.

Screening, Randomization, and Procedure. Participants answered a short set of prescreening questions online on Qualtrics to determine if they were eligible for the study. Prescreening questions were identical to Study 1. Once study eligibility was established, participants were informed that they met the study's eligibility criterion and they were directed to

continue onto the next page if they were interested in learning more about the study. Next, they were presented with the study's informed consent which included a description of the study's purpose. Participants were informed that they could stop at any time or refuse to answer any question if they didn't feel comfortable answering for any reason. Participants who consented to participate in the study then began participation.

Randomization. Participants were randomized via Qualtrics utilizing their randomizer element. Participants were randomly assigned to one of two conditions: a tailored message condition or a generic message condition. Qualtrics' "evenly present elements" was selected to ensure there was not a large imbalance in the number of participants assigned to each condition. First, participants completed pre-test (prior to being exposed to a health message) study questionnaires on their general health, sexual behavior, HIV testing behavior, reasons for previous testing, and the importance of HIV testing. Next, participants were exposed to a randomized health message condition (intervention or generic message). Time spent on the page was recorded to assess length of message exposure. Last, participants completed post-test (following health message exposure) questions on HIV test intentions, perceived susceptibility, perceived risk, perceived seriousness, perceived benefits, barriers to action, and cues to action. Participants responded to additional questions on message acceptability and feasibility, participant demographics, social desirability, and data manipulation checks to ensure that participants read and understood the message they were exposed to. Variables that were not significant predictors of HIV testing or HIV test intentions in Study 1, were not included in Study 2's survey. Participation lasted approximately 20 minutes.

Measures. Below is a description of the measures used for Study 2. The measures completed at pre-test were questions about general health, sexual risk behaviors, and if they used

a condom during the last time they had sex. Participants were also asked about their HIV test behavior in addition to their reasons for testing or never having been tested, and their perceived importance of an HIV test. These measures were the same as used in Study 1.

At post-test, participants completed items related to HIV test intentions, perceived susceptibility, perceived seriousness, perceived risk, perceived benefits, barriers to action, and cues to action, which were the same measures as those included in Study 1. In addition, following message exposure at post-test participants responded to several questions related to message acceptability, usefulness, comprehensibility, relevance, and general reactions to the HIV testing message.

Message Credibility, Relevance, and Usefulness. Measures of credibility, relevance, and usefulness were assessed by the following items: "The HIV message appeared to come from a trusted source," "The HIV message was relevant to people like me," and "The information in the HIV message was useful". Response options were rated on a 5-point scale from strongly disagree (1) to strongly agree (5).

Manipulation checks. Manipulation checks were assessed using two items: "The HIV testing message I read highlighted the good things that could happen if I get tested for HIV" and "The HIV testing message I read highlighted the bad things that could happen if I don't get tested for HIV." Responses were rated on a 7-point scale (1 = strongly disagree to 7 = strongly agree) (Hull & Hong, 2016).

Interest in HIV testing. Interest in HIV testing was assessed by the following item: "Viewing this health message made me think about getting tested for HIV." Response options were rated on a 5-point scale from strongly disagree (1) to strongly agree (5).

Message Comprehension. Message comprehension was assessed by responses to two statements. The HIV message was: 1 (extremely difficult to read) to 5 (extremely easy to read) and the HIV message was: 1 (extremely difficult to understand) to 5 (extremely easy to understand).

Emotional Response to Message. Emotional response to the message was measured by participants rating their level of agreement with several emotional options. "This message made you feel …?" Emotional response reactions included worried, fearful, uncomfortable, helpless, sad, angry, hopeful, concerned about yourself, concerned about someone else, and concerned about your community. Response options were rated on a 5-point Likert scale from 1 = "strongly disagree" to 5 = "strongly agree."

HIV Test Intentions. Participants responded to the following question "I plan/will/intend to get tested for HIV/AIDS in the next 3 months." Response options were yes/no. Participants were also asked "How likely are you to receive an HIV test within the next 3 months?" Response options were 1 = definitely won't to 7 = definitely will.

Socio-demographics. Data were collected on participant's age, gender, race, ethnicity, sexual orientation, previous education obtained, current educational level, state location, income, health insurance status, relationship status, marital status, and whether participants were pregnant or attempting to become pregnant.

Quality Control (Dosage). To ensure that each participant received an adequate dosage of each message, participants were instructed to spend a minimum of 1-2 minutes reviewing the message they received in the instructions presented immediately prior to message exposure. The amount of time that each participant spent on the message page was tracked in Qualtrics.

Data Analysis Plan. To analyze how the message condition influenced the primary outcome of HIV test intentions in the next 3 months, data was analyzed using a linear regression. This test determined whether the intervention had a significant effect on HIV test intentions in the next 3 months when compared to the generic condition. A total of *N* =130 participants were recruited. This analysis controlled for potential covariates such as previous HIV testing and current sexual risk behaviors. Secondary outcomes were questions related to feasibility and acceptability of the health message by condition. These were also analyzed utilizing a series of regressions.

Power Analysis. A power analyses (Cohen, 1992) revealed that to obtain a medium effect size at $\alpha = 0.05$, a total of 107 participants were sufficient to detect significant differences in group proportions of HIV test intentions across the 2 conditions. A total of *N* =130 participants were recruited to account for missing data and the inclusion of covariates in analyses.

Missing data plan. Missing data for Study 2 was handled in the identical manner outlined in Study 1.

Study 2 Results

Descriptive Statistics for Sociodemographics

Descriptive analyses for demographic variables and covariates were computed. These variables included age, race/ethnicity, sexual orientation, current education level, state location, family income, health insurance, and relationship status:

Age. Eligibility criteria required that participants be between the ages of 18-24, thus all participants fell within this age range. Most participants were 22 years of age (23.42%). The age distribution was as follows: 18 years (9.91%), 19 years (18.02%), 20 years (10.81%), 21 years (22.52%), 22 years (23.42%), 23 years (6.31%), and 24 years of age (9.01%).

Race/ethnicity. Inclusion criteria again required all participants to identify as Black or African American, thus all participants were of this racial/ethnic background. Two participants (1.8% of the sample) reported also being of Hispanic origin.

Sexual orientation. Eighty-two percent of the sample reported a heterosexual orientation. The remaining distribution was as follows: bisexual (9.09%), gay or lesbian (4.5%), unsure (1.82%), and other (0.91%).

Current education level. Most participants (59.46%) reported their current education level as "Pursuing a Bachelor's Degree." The next highest category was "Taking college credit, no degree" at 17.12%.

State location. The majority of participants lived in Virginia (51.82%) or North Carolina (30%).

Family income. The majority (27.03%) reported that their immediate family household income was between $10-30,000 per year. The remaining participants' income were distributed as follows: $0-10,000 (18.02%), $30,001-50,000 (18.92%), $50,001-70,000 (22.52%), and those exceeding $70,000 per year (13.51%).

Health insurance. The majority of participants had health insurance (81.98%).

Relationship Status. Forty-eight percent reported not being in a relationship. Nearly 20% (19.82%) were in a casual relationship and 30.63% were in a committed relationship but not living together.

Time Spent on Page. During the data analysis phase, two t-tests were conducted comparing those who spent less than 60 seconds on the page to those that spent the recommended amount of time on the page (e.g., at least 60 seconds) on HIV test intentions. One t test was conducted for each health message group. For the generic message group there was no

significant differences in those who spent less than 60 seconds on the page (M = 4.95, SD =2.06) and those who spent more than 60 seconds on the page (M = 4.88, SD = 1) on HIV test intentions, $t(55) = .11$, $p = 0.91$. For the intervention message group there was also no significant differences in those who spent less than 60 seconds on the page (M = 5.18, SD =2.14) and those who spent more than 60 seconds on the page (M = 4.75, SD = 2.27) on HIV test intentions, $t(52) = .69$, $p = 0.49$.

Descriptive Statistics for Dependent Variable.

HIV Test Intentions. Three-fourths of the sample (75%, n = 109) indicated that "yes" they planned to get tested in the next 3 months. In response to the question, "How likely are you to get tested for HIV/AIDS in the next 3 months?" participants' mean score was 4.97 (SD = 2.09) (on a scale that ranged from "1" … to "7") suggesting that they were slightly likely to get tested for HIV in the next 3 months

Research question and Hypothesis 1 and 2 Results

Study 2 answered the following research question: Will a culturally tailored HIV testing message be more effective in increasing HIV test intentions compared to a generic message? Study 2 tested the following hypotheses.

H1: Women in the culturally tailored HIV testing message condition will have higher rates of HIV test intentions compared to participants in the generic message condition.

H2: Women in the culturally tailored message condition will rate the HIV test message as more acceptable than participants in the generic condition at post-test.

To answer the research question and to answer H1, a linear regression model was constructed. The independent variable was the intervention effect, with the generic message coded as "0" and the intervention message coded as "1". This analysis controlled for the

following variables: age, number of sexual partners, condom use, and previous HIV test. Findings revealed that the intervention effect variable was not a significant predictor of future HIV test intentions $t(1) = 1.00$, $p = 0.317$. When the intervention effect variable was tested to see if it univariately predicted HIV test intentions alone without control variables, the nonsignificant effect remained. None of the other control variables in the full model significantly predicted HIV test intentions.

To answer the research questions associated with H2, a series of t-tests were conducted to determine if mean scores on the evaluation outcomes of interest were significantly different between the intervention group and the generic message group. Table 2 contains the findings from these tests. Findings did not reveal significant differences between groups on any of the variables tested, however two of the variables ("The HIV testing message I read highlighted the good things that could happen if I get tested for HIV" and "This message made you feel: Sad") did trend toward significance. Women in the intervention group had higher mean scores on both of these variables.

Table 2. Intervention Message Evaluation T-tests

	Generic Message		Intervention Message				
Variables	*M*	*SD*	*M*	*SD*	*df*	*t*	*p*
Trusted Source	3.9298	0.9231	4.0909	0.8665	110	-0.95	0.3435
Relevant	4.1754	1.0199	4.3333	0.7770	109	-0.91	0.3629
Useful	4.3158	0.8693	4.444	0.6344	102.45	-0.89	0.3734
Good Things	3.5789	1.1172	3.9444	0.9793	109	-1.83	0.0702
Bad Things	3.4035	1.2080	3.6296	0.9770	109	-1.08	0.2822
Think about Testing	4.000	0.9636	4.0556	0.8990	109	-0.31	0.7544
Easy to Read	4.2632	1.0611	4.3962	0.6889	96.847	-0.79	0.4408
Easy to Understand	4.5439	0.6566	4.4630	0.6358	109	0.66	0.5114

Worried	2.8421	1.1463	2.5455	1.0856	110	1.41	0.1628
Fearful	2.5439	1.0868	2.4815	1.0944	109	0.30	0.7638
Uncomfortable	2.2632	0.9733	2.2830	1.0072	108	-0.11	0.9164
Helpless	1.6491	0.6679	1.7407	0.6497	109	-0.73	0.4658
Sad	1.8393	0.7811	2.1296	1.0288	108	-1.67	0.0976
Angry	1.7018	0.8653	1.944	0.8107	109	-1.52	0.1307
Hopeful	2.9636	1.0357	3.0741	1.0963	107	-0.54	0.5898
Concerned about Yourself	2.8421	1.2927	2.8519	1.2798	109	-0.04	0.9682
Concerned about Someone Else	3.0893	1.2831	3.2963	1.1265	108	-0.90	0.3712
Concerned about your Community	5.6842	1.6492	5.9074	1.3356	109	-0.78	0.4365

Discussion

Undiagnosed HIV infections among young adults are a significant barrier to preventing new HIV transmissions among young adults (CDC, 2015a). Given that African American women comprise 2 out of 3 HIV diagnoses among women across all age groups, undiagnosed HIV infections among young African American women are of specific concern. This study marks one of the first to delve deeper into understanding HIV testing among young African American females. Previous work has identified rates of HIV testing among various subpopulations of interest but have largely failed to address more complex questions to further understand predictors of HIV testing and HIV test intentions (Hall, Walker, Shah, & Belle, 2012). Other studies have implemented safer sex interventions but have been limited to primarily focusing on sexual behavior (Thomas et al., 2008). This study is unique in its examination of non-traditional and culturally unique (e.g., HIV conspiracy theories, gender ratio imbalance beliefs, and gender role beliefs) predictors of HIV testing and testing intentions.

There are several other unique features of this research. While previous work has targeted health messages about HIV testing toward this population via mass HIV testing campaigns (Davis et al., 2011), this research is one of the first to utilize a formative study in developing an evidence-based message. Studies that have developed targeted HIV testing health messages have primarily focused on MSM populations (French, Bonell, Wellings, & Weatherburn, 2014; Hecht, Riggs, Hargraves, Wei, & Raymond, 2011; Solorio et al., 2016). An expert health message development team was used to create the health message, which is another distinctive aspect of this study. Last, this study is unique in that the health messages were designed to be viewed online via social media websites that are popular among young adults.

The purpose of this study centered on three primary aims: 1) to discover barriers and facilitators of HIV testing among young African American women; 2) to develop a culturally-targeted and evidence-based health intervention message for young African American women, and 3) to examine the intervention message's exposure effect on HIV test intentions post-test. Results from this study underscore the importance of understanding and further exploring predictors of HIV testing among various subpopulations of young adults. These findings also provide suggestions for developing effective strategies and health messages in applied settings to increase HIV testing motivations. Equally important, this study provided evidence for understanding factors that may *not* be effective in increasing HIV testing among young African American women. In the next three sections, an overview and discussion of Study 1, the health message development, and Study 2 findings are presented.

Overview of Study 1 Findings

Research Question 1. The purpose of this research question was to determine what factors significantly predicted past HIV testing among young African American women. Two

regression models were used to evaluate this research question. First, a modified version of the Health Belief Model was utilized to assess the influence of perceived benefits, perceived barriers, perceived seriousness, perceived susceptibility, and cues to action variables on odds of past HIV testing. Findings revealed that perceived benefits of HIV testing was a significant predictor of past HIV testing, such that women who perceived more benefits of getting tested were more likely to have been tested for HIV. This finding supports the perceived benefits component of the HBM. The HBM posits that perceived benefits are associated with an increased likelihood of pursuing a preventative health action, given that the expected outcome provides an individual with the confidence to take action toward preventing a health problem (Tarkang & Zotor, 2015; Zimet, Liau, & Fortenberry, 1997). This finding also suggests that when women are informed and aware of benefits to getting tested for HIV (such as feeling good about oneself for being proactive regarding their health, being able to catch the virus sooner and get connected to healthcare if HIV positive, etc.), they will be more likely to seek HIV testing.

Barriers to getting tested for HIV was a significant predictor of past HIV testing, such that when perceived barriers to testing were higher women were less likely to have been previously tested. Thus, this finding provided support for the perceived barriers component of the HBM. This finding is consistent with past literature indicating that individuals who have greater barriers to HIV testing report delays in being tested for HIV and are less likely to have ever been tested (Johns, Bauermeister, & Zimmerman, 2010).

Results from this study did not provide evidence for perceived susceptibility, perceived seriousness, or the cues to action components as significant predictors of past HIV testing. The nonsignificant findings related to perceive susceptibility is consistent with past research that indicates that young emerging adults have high feelings of general invincibleness (Arnett, 2000)

and generally believe their HIV risk to be low (Moore, 2013; CDC, 2015a). Another explanation could be that perceived seriousness is unrelated to HIV testing because young adults generally do not believe themselves to be at risk for HIV (Mattson, 2002). In other words, even if they think HIV is a serious health concern, perceived personal risk for HIV is low enough that perceived seriousness of the virus has no significant impact on their personal health behaviors.

A second regression model also examined predictor variables (e.g., HIV knowledge, HIV testing beliefs, HIV conspiracy theories, gender ratio imbalance beliefs, gender role beliefs, number of sexual partners, and condom use) and their relationship to past HIV testing. Number of sexual partners was a significant predictor of HIV testing. Women with more past sexual partners were more likely to have been tested for HIV. This finding is in line with previous research using a national representative sample of youth and young adults 18-24 years old (Adebayo & Gonzalez-Guarda, 2017) that also found young adults with a greater number of lifetime sexual partners were more likely to have been tested for HIV. This finding may also be explained by the common belief that having a low number of sexual partners (or only one sexual partner) guarantees that one is at low risk for HIV. In fact, this study found that the belief that one was at "No risk or low risk" for HIV to be a commonly reported reason for never being tested for HIV. HIV knowledge, HIV testing beliefs, gender ratio imbalance beliefs, and condom use were not supported as significant predictors of past HIV testing. The findings associated with the predictor variables HIV conspiracy theory beliefs and gender role beliefs and HIV testing intentions that were included in Study 1's hypotheses are discussed below.

Research Question 2. The purpose of research question 2 was to determine which factors were significantly associated with HIV test intentions over the next 3 months. The same two models as described above also evaluated this research question. The model with the HBM

variables revealed that number of sexual partners was significantly associated with greater future intentions to be tested for HIV in the next 3 months. Participants who had a greater number of sexual partners may believe their risk for HIV infection to be higher and in fact, a high number of partners is a known risk factor for HIV (HIV.gov, 2019). As revealed in this study's descriptive findings, a major reason for not being tested for HIV in the past was the belief that one had "no risk, or low risk" for HIV. Perhaps participants with fewer sexual partners perceive their HIV risk to be low enough to not warrant a future need for HIV testing. In addition, perceived importance of HIV testing was significantly associated with future HIV test intentions in the next 3 months. This significant finding provides evidence that highlighting the importance of HIV testing may be a key strategy in increasing a woman's future intentions to be tested for HIV.

Hypothesis 1 and Hypothesis 3. Hypothesis 1 predicted that women with lower conspiracy theory beliefs would be more likely to have been tested for HIV. Findings revealed that conspiracy theory beliefs were not significantly associated with HIV testing. Thus, this hypothesis was not supported. Overall, the average participant reported somewhat believing in HIV conspiracy theories. It is possible that although some women believe in HIV conspiracy theories, this belief is not strong enough to influence their HIV testing decisions. The fact that this sample was female and not male may also help explain the lack of significance of conspiracy theories given that African American men are more likely than African American women to hold conspiracy theory beliefs (Bogart & Thorton, 2005).

Hypothesis 3 predicted that women with lower conspiracy theory beliefs would be more likely to report higher HIV test intentions over the next 3 months. This hypothesis was not supported. The reasons for the lack of an association is likely the same as those reported for past

HIV testing (i.e., African American women are not likely to endorse conspiracy beliefs) (Bogart & Thorton, 2005). Future studies should examine how various levels of beliefs (i.e. comparing high beliefs in HIV conspiracy theories to low beliefs) might impact HIV test decisions.

Hypothesis 2 and Hypothesis 4. Hypothesis 2 predicted that gender role beliefs would be associated with HIV testing, such that women higher in agency (those who endorsed less caretaking or traditional gender role beliefs) would be more likely to have been tested for HIV. Findings did not support agency as a significant predictor of HIV testing. This finding may be explained by previous research showing that although African American women have general high levels of agency, they tend to endorse traditionally feminine gender role beliefs in the context of their romantic/sexual relationships (Fullilove, Fullilove, Haynes, & Gross, 1990). These lower levels of agency may spill over into influencing sexual decisions such as HIV testing as well. This finding may be interpreted as further support for the notion that masculine or agentic gender role beliefs do not positively influence sexual behavior related decisions among African American women.

Hypothesis 4 predicted that gender role beliefs would be associated with increased future intentions to be tested for HIV, such that women higher in agency would be more likely to report increased future intentions to be tested for HIV. Findings did not reveal evidence to support this hypothesis. Similar to the nonsignificant finding in Hypothesis 2, the finding from Hypothesis 4 may be explained by the fact that while increased agency influences other domains in the lives of African American women, it does not hold the same weight in the context of their romantic/sexual relationships (Fullilove, Fullilove, Haynes, & Gross, 1990). Similarly, it may not influence sexual behavior related decisions.

Health Message Development. The significant variables identified in Study 1 were incorporated into a tailored health message that was tested in Study 2. Development of the message also relied on evidence from previous research on effective health message components. For example, additional cues on where to get tested for HIV were included in the tailored condition (e.g., suggesting HIV testing by a doctor office or with a health care provider) that were not included in the generic condition. This is in line with previous work that shows that detailed information about where to get an HIV test is an important element to include in an HIV testing health message (McOwan et al., 2002). Also, previous work indicate that effective HIV test messages should be clear and simple. Therefore, the health message development team worked to ensure that the information on the health message fliers was readable and that text was minimized (Hilliam, Fraser, &Turner, 2011). Bulleted points, bubbled sections, a modern font, and large section headers were also used to break up text and to simplify the health message's appearance. In addition, given the general stigma that persists around HIV, a decision was made to not include the traditional red ribbon.

Targeted peer images (McOwan et al., 2002) were also utilized in the intervention message. Consistent with the study's goals to create a culturally tailored health message, the skin color and hair color/texture of the vector images in the intervention group were strategically chosen to represent common physical/cultural characteristics of young African American women. Research has supported the use of peer messages in having positive influences on HIV test intentions. For example, one of the first message framing studies among African American women that measured HIV test intentions as an outcome (Kalichman & Coley, 1995) found that women in a gender-ethnicity matched framing condition reported significantly greater intentions to get tested for HIV when compared to a ethnicity-matched condition and a loss-framing

condition. This finding further supports this study's use of vector images that were matched by gender and ethnicity. Cultural and personal framing in the intervention message group were further emphasized by displaying HIV test statistics among African American women.

Overview of Study 2 Findings

Research Question1/Hypothesis 1. The purpose of research question 1 was to assess and compare if a culturally targeted and evidence-based HIV health message for young African American women would be more effective at increasing HIV test intentions when compared to a generic health message. Hypothesis 1 predicted that women in the culturally tailored HIV testing message condition would have higher rates of future HIV test intentions in the next 3 months compared to women in the generic health message condition. Findings revealed that the intervention effect variable was not a significant predictor of future HIV test intentions in the next 3 months. The lack of significant findings may be explained by the fact that both message groups included components that encouraged participants to be tested for HIV. As a result, the salience of the intervention message compared to the generic message may have been reduced. It is possible that the inclusion of a control group would have allowed for an additional set of analyses to test whether exposure to either message group was effective in increasing HIV test intentions compared to a control group (non-message exposure). Salience of the intervention message may have also been reduced due to the generic message's focus on women also. For example, if the generic testing message had focused on all young adults as opposed to targeting women, only, perhaps this would have increased the salience and the unique features of the intervention message.

An alternative explanation is that the intervention effect variable was nonsignificant due to the study's sample size. Perhaps a larger more representative sample would have provided

more power to detect any potential small effects that may have existed. Even after viewing the health message about HIV testing, participants from both groups still reported a low perception of being susceptible to HIV. Identifying strategies to increase perceived vulnerability may be an important factor to explore in future studies to increase HIV test intentions and behaviors.

Hypothesis 2. Hypothesis 2 predicted that women in the culturally tailored message condition would rate the HIV test message as more acceptable than women in the generic condition at post-test. Findings revealed no significant differences between message conditions on the evaluation outcome variables related to acceptability. However, two items did trend toward significance. These items included responses to whether the HIV testing message highlighted good things that could happen if women were to get tested for HIV and also reports of feeling sad in response to the message. Women in the intervention group had higher mean scores in reporting that the message highlighted good things that could happen if they were to get tested. Women in the intervention group also had higher mean scores in reporting that the message made them feel sad.

In summary, several predictor variables were found to be related to the outcomes of HIV test behavior and HIV test intentions in Study 1. However, Study 2 hypotheses were not supported. The intervention effect variable was not significant, and no significant differences were observed between the tailored and generic message groups. In spite of a nonsignificant effect of the health message, findings from Study 1 provided some implications for programs in clinical and applied settings, in addition to lessons learned that lend themselves for suggestions for future research directions. These topics are discussed in the following sections.

Implications for Practice, Policy, and Interventions

Findings from this study have implications for those who conduct HIV prevention work. There are implications from this study for HIV prevention related to the development of interventions and programs, clinical practice and healthcare, and marketing of HIV prevention health information.

Intervention and Programmatic Implications. To date, most HIV prevention interventions have focused on safer sex behaviors such as increasing condom use and condom negotiation skills, condom self-efficacy, and HIV/STD knowledge among Black women (CDC, 2015b). While these are important topics, the focus on these topics alone limits the effectiveness of safer sex interventions for African American women in meeting HIV prevention goals. This is because African American women do not engage in higher sexual risk behaviors compared to women of other racial/ethnic groups, and their increased risk for HIV is not explained by sexual risk causes. Given the higher risk for HIV among young African American women and the benefits of HIV testing, interventions that address HIV testing motivations and benefits/barriers of HIV testing, might better meet HIV prevention goals among this population.

This study found that nonsexual behavior risk related factors—perceived benefits, perceived barriers, and perceived seriousness—were significantly associated with past HIV testing, which supports the inclusion of non-sexual behavior related topics in HIV testing interventions. Number of sexual partners was significantly associated with past HIV testing and HIV test intentions as well and should continue to be included as a topic of discussion in safer sex interventions. However, women should also be informed that having multiple sexual partners is not the only indication of one's need to be tested for a HIV. Safer sex interventions for African American women need to reiterate the importance of routine testing for all persons who are sexually active, irrespective of their number of lifetime or current sexual partners.

Clinical Implications. Findings from Study 1 may be useful to healthcare providers and test counselors who talk with their patients about reasons to be tested for HIV. Increasing HIV testing has implications for decreasing rates of other STIs in addition to HIV. Presenting to a healthcare provider or HIV/STD counselor for HIV testing provides the healthcare provider with an opportunity to encourage patients to be tested for other STIs.

Given that unprotected sex (i.e. whether one used a condom during their last sexual act) was not significantly associated with past HIV testing or future HIV test intentions, providers should be aware of the potential need to focus on other risk factors when persuading patients to be tested for HIV. Particularly, patients who engage in protected sex may not feel the need to be tested. Asking patients why they are presenting for testing may be an important question to ask for facilitating conversations about reducing sexual risk.

HIV Testing Marketing. The findings from Study one provides suggestions for strategies to think about when tailoring and marketing HIV testing messages to specific groups, as opposed to using a one size fits all approach. Among African American women HIV testing may be encouraged, if the perceived barriers of HIV testing are addressed, the benefits are highlighted, seriousness of HIV infection is communicated, and the importance of HIV testing is conveyed. For example, the benefits of HIV testing might be displayed on a flyer in the waiting room of a health care provider clinic. Given that women rated social media as their top preference for where to receive a health message about HIV testing, another suggestion is to implement messages using social media. Other studies have suggested the use of music and music videos (Wallace, McLellan-Lemal, Harris, Townsend, & Miller, 2011) and the advertisement of group testing to reduce testing-related stigma (Hall, Peterson, & Johnson, 2014).

Limitations

The current study was one of the first to develop and test an evidence-based HIV testing intervention among African American women in emerging adulthood. While the intervention message was not effective in increasing HIV test intentions, this study contributed to our knowledge of factors that influence testing behaviors and intentions among this population. Despite these novel contributions, this study does have important limitations to note.

The first limitation is the cross-sectional design of both studies. Given the study's design, opinions about HIV testing are only a snapshot of what participants beliefs were during the time of data collection. This study did not assess how beliefs or opinions might change over time. Second, while the study's focus on the restricted age group of young adults allowed for a focused inquiry of HIV testing predictors among this population, the age restriction may have limited the generalizability of the findings. Nearly 26% of the sample in Study 1 were aged 18 or 19. Due to age restrictions, it is possible that rates of HIV testing might have been influenced as 18 and 19 year-olds likely have not had the same opportunities to be tested for HIV as their older counterparts. Another limitation is that simply participating in a study about HIV testing might have increased reports of HIV test intentions among participants in both studies.

Approximately 60% of participants in both studies reported currently pursuing a Bachelor's degree. Previous research has found that African Americans with higher educational levels are more likely to have been previously tested for HIV (Onyeabor, Iriemenam, Adekeye, & Rachel, 2013). Therefore, the study results might have been different if the sample had more non-college students. In addition, most participants currently resided in North Carolina or Virginia, thus regional biases may have limited generalization of the findings as well. It is possible that findings would have been different if data had been collected from a nationally

represented sample of women. Finally, this study was also limited given the self-report nature of the survey. This study inquired about sensitive personal questions related to participants sexual history and current sexual behaviors. Although efforts were made to address these issues (i.e., participants were reminded that they did not have to answer any question they did not feel comfortable answering and encouraged to complete the survey in a private area), it is possible that some participants felt pressure to respond to sensitive questions in a socially desirable manner.

Future Research

With these limitations noted, there are several recommendations for future research. These recommendations largely focus on overcoming the limitations of the current study, in addition to recommendations for enhancing the development of HIV testing messages for young American women. A larger sample size is needed as it would allow for greater power and the potential to detect smaller significant effects if they exist. Future work should also consider utilizing a non-health message control group. A control message group would allow for additional analyses to determine if a health message about HIV testing is more effective than non-exposure to a health message.

Future studies should also test HIV health message interventions using a more geographically diverse sample to account for regional differences that may have biased study results. Both Virginia and North Carolina are Southern states where HIV prevalence is disproportionally higher than from other regions in the country (CDC, 2015c), thus opinions about HIV testing and HIV test behaviors may differ among person in these regions compared to regions where HIV prevalence is lower. Barriers to HIV services also likely have a greater impact on persons in these regions. For example, a study by Kimmel et al. found differences in

structural barriers to HIV care in the US South, such that geographic proximity to care was worse for non-Hispanic Blacks compared to non-Hispanic Whites (Kimmel et al., 2018). Future studies should consider strategies for increasing HIV testing (e.g., mobile HIV testing, providing at home kits, etc.) among individuals who have longer drive time to reach HIV testing services.

Several of the cultural variables (HIV conspiracy theories, gender role beliefs, and gender ratio imbalance beliefs) were not significant predictors of HIV testing or test intentions. Other cultural variables (e.g., race-related stress, discrimination, racial identity, etc.) should be explored to examine their potential significant relationship to HIV test behaviors. For example, past research has found race-related stress and discrimination to be related to negative health outcomes (Belgrave & Allison, 2018). Greater levels of racial identity have also been found to be a serve as a protective factor against negative health outcomes (Sellers et al. 2000). Thus, these relationships may be noteworthy to explore. Additional relevant variables to explore could include skin color and skin color satisfaction, experiences of racial bias in healthcare settings, and family and social support. Cultural values such as religiosity, resilience, temporal orientation, and collectivism may be important to explore as well.

More work is also needed to understand differences in predictors of HIV testing among various subpopulations of young adults. Recent work by Moore et al. (2016) found that predictors of HIV testing among a sample of emerging young adults differed by race/ethnicity. Future work examining between-group differences may be useful in further identifying racially/culturally specific predictors of HIV test behaviors. Additional studies exploring within group predictors of HIV testing among African American women would also lend well toward further understanding significant predictors of HIV test behaviors. Future research should

consider comparing within group differences by age, personality traits, and other individual risk behaviors,

Finally, research has found lost-framed messages emphasizing cultural and personal losses to be effective in increasing HIV test behavior (Kalichman & Coley, 1995). The intervention message in this study addressed benefits to HIV testing in support of a gain-framed approach and did not contain loss-frame components. Future studies should examine culturally tailored loss-framed and gain-framed messages to compare the two for effectiveness in increasing HIV test behavior and future HIV test intentions.

Conclusion

Undiagnosed HIV infections are a key contributor to new HIV transmissions among young adults. Even though being tested for HIV is the only way to know one's status, few studies have examined HIV test motivations among young adults. African American women are especially vulnerable to HIV infection, although they do not engage in higher rates of sexual risk behaviors that would account for their increase risk of infection. There is a need to further examine factors that influence rates of HIV testing among this group. This study found that perceived benefits and perceived barriers of HIV testing, perceived seriousness of HIV, and perceived importance of HIV testing were significant predictors of past HIV testing or HIV test intentions. Findings from this study suggests that there are unique factors among young adult Black women that explain reasons for being tested for HIV, and motivations to be tested for HIV in the future. These findings suggest that HIV testing communication should incorporate these significant factors into their messaging. However, given that there was no difference in the effectiveness among the two testing messages, there is a need for further tailoring of HIV testing messages and utilizing alternative designs to create a more effective health message.

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Appendixes

Appendix 1
Prescreening Questions

Prescreening Questionnaire

1) What is your age in years?
   - (Fill in the blank response will be populated)

2) How would you describe your gender?
   - Male
   - Female
   - Other

3) How would you describe your race?
   - White or European American
   - Black or African American
   - Bi-racial or multi-racial (e.g., Black and other ethnic group/s)
   - American Indian
   - Native Hawaiian or Other Pacific Islander
   - Asian
   - Alaska Native
   - Other

4) Do you identify as:
   - Hispanic
   - Not Hispanic

5) How would you describe yourself? (Sexual orientation)
   - Heterosexual
   - Bisexual
   - Gay or Lesbian
   - Unsure
   - Other

6) What is the highest of education you have completed? *If currently enrolled, mark the previous highest degree received.*
   - No schooling completed
   - Nursery school to 8th grade
   - Some high school, no diploma
   - High school graduate, diploma or the equivalent (for example: GED)
   - Some college credit, no degree
   - Trade/technical/vocational training
   - Associate degree
   - Bachelor's degree
   - Master's degree
   - Professional degree
   - Doctorate degree

7) What is your current level of education?
   - Not in school
   - In high school
   - Pursing high school diploma equivalent (GED)
   - Taking college credit, no degree
   - Pursuing trade/technical/vocational training
   - Pursing an Associate degree
   - Pursing a Bachelor's degree
   - Pursing a Master's degree
   - Pursing a Professional degree
   - Pursuing a Doctoral degree

8) What state do you currently live in?
   - (Fill in the blank response will be populated)

9) About how much income have you and your immediate family members made in the last year before taxes?
   - $0-10,000
   - $10,001-30,000
   - $30,001-50,000
   - $50,001-70,000
   - More than $70,000

10) Do you have medical or health care insurance?
   - No
   - Yes, I obtained it through a health insurance marketplace
   - Yes, I obtained it through a source other than a health insurance marketplace

11) What is your current relationship status?
   - Not in a relationship
   - In a casual relationship
   - In a committed relationship, not living together
   - In a committed relationship, living together

12) What is your current marital status?
   - Single
   - Married/Partnered
   - Separated
   - Divorced
   - Widowed
   - Other

13) If currently in a relationship or marriage, how long have you been with your partner?
   - 1 year
   - 2 years
   - 3 years

- 4 years
- 5 or more years

14) Which of the following best describes you?
    - Employed full-time (35+ hours per week)
    - Employed part-time
    - Unemployed (full-time student)
    - Unemployed (other reason)

15) On average, how many hours per week do you work?
    - (Fill in the blank response will be populated)

16) Have you ever served in the Armed Forces, in the Reserves, or the National Guard (select all that apply)?
    - No
    - Yes, in the Armed Forces
    - Yes, in the Reserves
    - Yes, in the National Guard

17) How many children, or dependents under the age of 18, do you have?
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6
    - 7 or more

18) Are you currently pregnant or attempting to become pregnant?
    - No
    - Yes

19) Have you ever engaged in any of the following in your lifetime?
    - Oral sex
    - Vaginal sex
    - Anal sex
    - None of the above

Appendix 2

Study 1 Measures

HIV-KQ-18

For each statement, please circle "True" (T), "False" (F), or "I don't know" (DK). If you do not know, please do not guess; instead, please circle "DK."

		True	False	I don't know
1.	Coughing and sneezing DO NOT spread HIV.	T	F	DK
2.	A person can get HIV by sharing a glass of water with someone who has HIV.	T	F	DK
3.	Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex.	T	F	DK
4.	A woman can get HIV if she has anal sex with a man.	T	F	DK
5.	Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV.	T	F	DK
6.	All pregnant women infected with HIV will have babies born with AIDS.	T	F	DK
7.	People who have been infected with HIV quickly show serious signs of being infected.	T	F	DK
8.	There is a vaccine that can stop adults from getting HIV.	T	F	DK
9.	People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if their partner has HIV.	T	F	DK
10.	A woman cannot get HIV if she has sex during her period.	T	F	DK
11.	There is a female condom that can help decrease a woman's chance of getting HIV.	T	F	DK
12.	A natural skin condom works better against HIV than does a latex condom.	T	F	DK
13.	A person will NOT get HIV if she or he is taking antibiotics.	T	F	DK
14.	Having sex with more than one partner can increase a person's chance of being infected with HIV.	T	F	DK
15.	Taking a test for HIV one week after having sex will tell a person if she or he has HIV.	T	F	DK
16.	A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV.	T	F	DK
17.	A person can get HIV from oral sex.	T	F	DK
18.	Using Vaseline or baby oil with condoms lowers the chance of getting HIV.	T	F	DK

HIV Testing Beliefs:

1) If you were to get tested for HIV in the next 3 months you expect the results to be negative.
    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

2) If you were to get tested for HIV in the next 3 months it will give you the opportunity to practice safe sex.
    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

3) If you were to get tested for HIV in the next 3 months you expect it to bring you peace of mind.
    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

4) If you were to get tested for HIV in the next 3 months you would fear getting the result.
    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

Section two

HIV/AIDS Conspiracy Beliefs

Instructions: For each statement below please indicate the response that best characterizes your opinion.
Key:
1 = Strongly Disagree
2 = Disagree
3 = Somewhat Agree
4 = Agree
5 = Strongly Agree

1. The medicines used to treat HIV are saving lives in the black community.
2. A lot of information about AIDs is being held back from the public.
3. HIV is man-made virus.
4. There is a cure for AIDS, but it is being withheld from the poor.
5. The government is telling the truth about AIDS.
6. The medicine used to treat HIV causes people to get AIDS.
7. HIV was created and spread by the CIA.
8. AIDS is a form of genocide against blacks.
9. The medicine that doctors prescribe to treat HIV is poison.
10. AIDS was created by the government to control the black population.
11. Doctors put HIV into condoms.
12. People who take the new medicines for HIV are human guinea pigs for the government.
13. Medical and public health institutions are trying to stop the spread of HIV in black communities.
14. AIDS was produced in a government laboratory.

Gender Ratio Imbalance Beliefs and Behaviors Scale (GRIBBS)

Higher gender ratio imbalance beliefs indicate that a woman believes that the ratio of men to women affects her decisions related to sexual behavior. Not using condoms to maintain a relationship based on the belief that there are fewer men in the population is an example of gender ratio beliefs.

Directions: Please complete the questionnaire using the criteria below. For each of the following items, place an "X" in the box of the response which best characterizes your opinion. If you have more than one partner please answer for your primary partner, the one with whom you have the closest, most steady relationship.

Key:
1 = Strongly Disagree
2 = Disagree
3 = Somewhat Agree
4 = Agree
5 = Strongly Agree

1. There are fewer men than women in my community.
2. Fewer men in my community decrease my chances of dating.
3. Fewer men in my community decrease my chances of getting married.
4. Fewer men in my community decrease my chances of having children.
5. Fewer men in my community decrease my chances of maintaining a steady relationship.
6. To maintain my relationship, I do not use a condom when having oral, vaginal, or rectal sex.
7. I allow my male partner to have sex with other female partners to maintain our relationship.
8. I use a condom even if it causes me to lose my mate.
9. I do not have sexual relationships when I know the man has multiple partners.
10. There are not enough men for all women to be in a steady and exclusive relationship.
11. Men are in demand and I will do whatever is required to keep them as my sexual partner.
12. If I make my man use a condom, he will go to another woman who will have sex without a condom.
13. Not having a man in my life means that I cannot have children.
14. I do not use condoms in order to keep my male sexual partner.
15. I always determine condom use in my relationship.
16. To maintain my relationship, I let my partner set what is expected in our sexual relationship.
17. To maintain my relationship, I do not question my partner about his involvement with others sexually.
18. I do not ask my partner to be tested for sexually transmitted infections (STIs) prior to having sex with him.
19. I believe if I ask my man to use a condom, I will lose him.
20. I negotiate condom use with my partner.

Belgrave Gender Role Inventory (BGRI)

(For this section, responses are rated on a 5-point bipolar adjective scale format where each item consists of a pair of characteristics (listed below). Letters A – E are the response options, representing two extremes on the scale, and participants circle the letter that best describes where they fall between the item pair.)

Instructions: Please mark where you fall between the following response options.

1.	Independent				Dependent
	A	B	C	D	E
2.	Trustworthy				Not Trustworthy
	A	B	C	D	E
3.	Weak				Strong
	A	B	C	D	E
4.	Irresponsible				Responsible
	A	B	C	D	E
5.	Resilient				Can Not Bounce Back Easily
	A	B	C	D	E
6.	An Advisor				Does Not Advise Others
	A	B	C	D	E
7.	Supportive of Others				Not Supportive of Others
	A	B	C	D	E
8.	A Caregiver				Not a Caregiver
	A	B	C	D	E
9.	Keeps Family Connected				Not Involved in Family Activities
	A	B	C	D	E

Section three:

Sexual risk and Health Behaviors

1) Health Questions
    - How would you describe your general health?
    - Excellent
    - Very good
    - Good
    - Fair
    - Poor
    - Don't Know
2) What is your height in feet and inches?

    _____

3) What is your weight in pounds?

    _____

4) Have you been diagnosed or treated for any of the following:

	Yes, in the past 12 months	Yes, but NOT within the past 12 months	No
Allergies			
Alopecia (Hair loss)			
Asthma			
Back pain			
Bronchitis			
Chlamydia			
Depression			
Diabetes			
Ear infection			
Endometriosis			
Genital herpes			
Genital warts/human Papillomavirus (HPV)			
Gonorrhea			
Hepatitis B or C			
High blood pressure			
High cholesterol			
Human Immunodeficiency Virus (HIV)			
Irritable Bowel Syndrome (IBS)			
Migraine headache			
Mononucleosis			
Pelvic Inflammatory Disease (PID)			
Pubic lice (crabs)			
Sinus Infection			
Syphilis			
Trichomoniasis			
Uterine Fibroids			

Vitamin D deficiency			

5) *In general*, how often do you or your partner use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during:

	N/A, have never did this sexual activity	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always
Oral Sex						
Vaginal Sex						
Anal Sex						

6) ***Within the last 12 months***, how often did you or your partner use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during:

	N/A, have never did this sexual activity	Have not done this sexual activity in the past 12 months	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always
Oral Sex							
Vaginal Sex							
Anal Sex							

7) ***Within the last 12 months*** did you have oral, vaginal, or anal sex with:

	No	Yes
A steady (main) partner?		
A causal partner?		

8) What is the age of your most recent male sexual partner?
< participants will insert number in blank space>

9) Have you ever had sex while high or on drugs ***in the past 12 months***?

N/A, have never did this	Never	Rarely (about	Sometimes (about 50% of the time)	Most of the time	Always

sexual activity		25% of the time)		(about 75% of the time)	

10) Have you ever had sex while or after consuming alcohol?

N/A, have never did this sexual activity	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always

11) How many sexual partners have you had in your lifetime?
- I am not sexually active
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

12) How many sexual partners have you had ***in the past 12 months***?
- I am not sexually active
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

9) Did you use a condom the last time you had sex?

- Yes
- No

10) Do you have a main sexual partner?
- Yes
- No

11) Do you have a causal sexual partner?
- Yes
- No

Section Four:

HIV Testing Questions

1) Have you ever been tested for HIV?
   - Yes
   - No
   - I don't know

2) How many times have you been tested for HIV?
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - 10 or more

3) What is the approximate date of your last HIV test?
   - (Insert month year in black space) or
   - I have never been tested

4) What was the location of your most recent HIV test?
   - Private doctor's office
   - School or college
   - Family planning clinic
   - Voluntary counseling and testing site
   - Mobile and outreach community HIV testing event
   - Workplace
   - Religious or faith-based organization
   - At home (self-tested)
   - During blood donation event
   - Other _____ (please specify)

5) If previously tested, were you tested for the following reasons?

	Not at all influential (1)	Slightly Influential (2)	Moderately Influential (3)	Very Influential (4)	Extremely Influential (5)
New sexual partner					
HIV symptoms					
To know your status					
Blood donation					

New relationship					
Doctor recommended test					
Partner infidelity					
Injection drug use					
Other (please specify)					

6) What is the primary or most important reason why you lasted tested for HIV?
   - o New sexual partner
   - o HIV symptoms
   - o To know your status
   - o Blood donation
   - o New relationship
   - o Doctor recommended test
   - o Partner infidelity
   - o Injection drug use
   - o Other (please specify)

7) If never tested, were you not tested for any of the following reasons?

	Not at all influential (1)	Slightly Influential (2)	Moderately Influential (3)	Very Influential (4)	Extremely Influential (5)
I don't want to know my HIV status					
I don't know where to get tested					
I don't have insurance coverage for test					
I am at no risk or low risk for HIV					
I'm in a monogamous relationship					
HIV testing is not confidential					
I am afraid of getting tested for HIV					
Getting an HIV test is too time consuming					

I will be negatively judged if I get an HIV test					
Other (please specify)					

8) What is the primary or most important reason why you have never been tested for HIV?
   - I don't want to know my HIV status
   - I don't know where to get tested
   - I don't have insurance coverage for test
   - I am at no risk or low risk for HIV
   - I'm in a monogamous relationship
   - HIV testing is not confidential
   - I am afraid of getting tested for HIV
   - Getting an HIV test is too time consuming
   - I will be negatively judged if I get an HIV test
   - Other (please specify)

9) I plan/will/intend to get tested for HIV/AIDS in the next 3 months?
   - No
   - Yes

10) How likely are you to get tested for HIV/AIDS in the next 3 months?
   - Extremely unlikely
   - Moderately unlikely
   - Slightly unlikely
   - Neither likely nor unlikely
   - Slightly likely
   - Moderately likely
   - Extremely likely

11) In your opinion, how important is HIV testing?
   - Extremely important
   - Very important
   - Moderately important
   - Slightly important
   - Not at all important

Open ended Questions:

1) What would prompt you to get an HIV test?

   _____ (respondents will be asked to respond in an open-ended manner).

2) What would prevent you from getting an HIV test?
   _____ (respondents will be asked to respond in an open-ended manner).

3-Item Perceived Risk Scale

1) If you get tested, how likely is it that the test results will be positive?
    - Extremely unlikely
    - Somewhat unlikely
    - Neither likely nor unlikely
    - Somewhat likely
    - Extremely likely

2) How likely is it that you have HIV?
    - Extremely unlikely
    - Somewhat unlikely
    - Neither likely nor unlikely
    - Somewhat likely
    - Extremely likely

3) How likely is it that you will get HIV in the future?
    - Extremely unlikely
    - Somewhat unlikely
    - Neither likely nor unlikely
    - Slightly likely
    - Extremely likely

Perceived Susceptibility	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
It is extremely likely I will get HIV in the future.					
I feel I will get HIV in the future.					
There is a good possibility I will get HIV in the next 10 years.					
My chances of getting HIV are great.					
I am more likely than the average woman to get HIV.					

Perceived Seriousness	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
The thought of HIV scares me.					
When I think about HIV, my heart beats faster.					
I am afraid to think about HIV.					
Problems I would experience if I were HIV positive would last a long time.					
HIV would threaten a relationship with my boyfriend, husband, or partner.					
If I had HIV my whole life would change.					
If I had HIV, I would not live longer than 5 years.					

Perceived Benefits	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
When I get tested for HIV I feel good about myself.					
When I get tested for HIV, I don't worry as much about having HIV.					
Getting tested each year for HIV will allow me to catch it early.					
If I get tested for HIV each year I will decrease my chance of dying from HIV.					
If I get tested for HIV each year I will decrease my chances of requiring radical health treatment if I were to be HIV positive.					
If I get tested for HIV each routinely each year, it will help me to find HIV sooner (if I were HIV positive), than if I were to wait for a doctor to recommend an HIV test.					

Perceived Barriers	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
I feel funny getting tested for HIV.					
Getting tested for HIV during the next year will make me worry about HIV.					
Getting tested for HIV would be embarrassing to me.					
Getting tested for HIV will take too much time.					
Getting tested for HIV will be unpleasant.					
There isn't enough privacy when getting tested for HIV.					

Perceived Health Motivation (cues to action)	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
I want to discover health problems early.					
Maintaining good health is extremely important to me.					
I search for new information to improve my health.					
I feel it is important to carry out activities which will improve my health.					
I eat well balanced meals.					
I exercise at least 3 times a week.					
I have regular health check-ups even when I am not sick.					

Section 5:

1) How interested would you be in receiving information about HIV testing through the following health communication platforms?

	Extremely *dis*interested (1)	Somewhat *dis*interested (2)	Neutral (3)	Somewhat Interested (4)	Extremely Interested (5)
TV/Commercial					
Flyer/poster					
Social Media Platform					
Online source other than Social Media					
Billboard					
Professional Presentation					
Email					
Text Message					
Doctor's Office					
Health Clinic					
Health Fair					
Community Center					
University/School event					
Newspaper					
Brochure					
Other (please specify)					

2) Of social media platforms selected, please indicate which social media platforms you would be interested in seeing a health message about HIV testing?

   _____

3) If other selected, please choose from the following options and then fill in the blank.
   - Messages delivered in person: _____
   - Messages delivered via online or social media: _____
   - Messages delivered via advertisement: _____

4) Which communication platform would you be most interested in receiving information about HIV testing through?

   - TV/Commercial
   - Flyer/poster
   - Social Media Platform
   - Online source other than Social Media
   - Billboard

- Professional Presentation
- Email
- Text Message
- Doctor's Office
- Health Clinic
- Health Fair
- Community Center
- University/School event
- Newspaper
- Brochure
- Other (please specify)

Section Six

Demographics

20) What is your age in years?
- (Fill in the blank response will be populated)

21) How would you describe your gender?
- Male
- Female
- Other

22) How would you describe your race?
- White or European American
- Black or African American
- Bi-racial or multi-racial (e.g., Black and other ethnic group/s)
- American Indian
- Native Hawaiian or Other Pacific Islander
- Asian
- Alaska Native
- Other

23) Do you identify as:
- Hispanic
- Not Hispanic

24) How would you describe yourself? (Sexual orientation)
- Heterosexual
- Bisexual
- Gay or Lesbian
- Unsure
- Other

25) What is the highest of education you have completed? *If currently enrolled, mark the previous highest degree received.*
- No schooling completed
- Nursery school to 8th grade
- Some high school, no diploma
- High school graduate, diploma or the equivalent (for example: GED)
- Some college credit, no degree
- Trade/technical/vocational training
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

26) What is your current level of education?
- Not in school
- In high school

- Pursing high school diploma equivalent (GED)
- Taking college credit, no degree
- Pursuing trade/technical/vocational training
- Pursing an associate's degree
- Pursing a Bachelor's degree
- Pursing a Master's degree
- Pursing a Professional degree
- Pursuing a Doctoral degree

27) What state do you currently live in?
- (Fill in the blank response will be populated)

28) About how much income have you and your immediate family members made in the last year before taxes?
- $0-10,000
- $10,001-30,000
- $30,001-50,000
- $50,001-70,000
- More than $70,000

29) Do you have medical or health care insurance?
- No
- Yes, I obtained it through a health insurance marketplace
- Yes, I obtained it through a source other than a health insurance marketplace

30) What is your current relationship status?
- Not in a relationship
- In a casual relationship
- In a committed relationship, not living together
- In a committed relationship, living together

31) What is your current marital status?
- Single
- Married/Partnered
- Separated
- Divorced
- Widowed
- Other

32) If currently in a relationship or marriage, how long have you been with your partner?
- 1 year
- 2 years
- 3 years
- 4 years
- 5 or more years

33) Are you currently pregnant or attempting to become pregnant?
- No
- Yes

Section Seven

Social Desirability Scale-17 (SDS-17)

Key: 1=True

2=False

1. I sometimes litter. (R)
2. I always admit my mistakes openly and face the potential negative consequences.
3. In traffic I am always polite and considerate of others.
4. I have tried illegal drugs (for example, marijuana, cocaine, etc.). (R)
5. I always accept others' opinions, even when they don't agree with my own.
6. I take out my bad moods on others now and then. (R)
7. There has been an occasion when I took advantage of someone else. (R)
8. In conversations I always listen attentively and let others finish their sentences.
9. I never hesitate to help someone in case of emergency.
10. When I have made a promise, I keep it – no ifs, ands or buts.
11. I occasionally speak badly of others behind their back. (R)
12. I would never live off other people.
13. I always stay friendly and courteous with other people, even when I am stressed out.
14. During arguments I always stay objective and matter-of-fact.
15. There has been at least one occasion when I failed to return an item that I borrowed. (R)
16. I always eat a healthy diet.
17. Sometimes I only help because I expect something in return. (R)

Exposure of Previous HIV testing message

Have you ever been exposed to an HIV testing message via the following formats?

	No	Yes
TV/Commercial		
Flyer/poster		
Social Media Platform		
Online source other than Social Media		
Billboard		
Professional Presentation		
Email		
Text Message		
Doctor's Office		
Health Clinic		
Health Fair		
Community Center		
University/School event		
Newspaper		
Brochure		
Other (please specify)		

Appendix 3
Study 2 Measures List

Pretest Questions

Health Questions

1) How would you describe your general health?
   - Excellent
   - Very good
   - Good
   - Fair
   - Poor
   - Don't Know
2) What is your height in feet and inches?

   _____

3) What is your weight in pounds?

   _____

4) Have you been diagnosed or treated for any of the following:

	Yes, in the past 12 months	Yes, but NOT within the past 12 months	No
Allergies			
Alopecia (Hair loss)			
Asthma			
Back pain			
Bronchitis			
Chlamydia			
Depression			
Diabetes			
Ear infection			
Endometriosis			
Genital herpes			
Genital warts/human Papillomavirus(HPV)			
Gonorrhea			
Hepatitis B or C			
High blood pressure			
High cholesterol			
Human Immunodeficiency Virus(HIV)			
Irritable Bowel Syndrome (IBS)			
Migraine headache			
Mononucleosis			
Pelvic Inflammatory Disease (PID)			
Pubic lice (crabs)			

Sinus Infection			
Syphilis			
Trichomoniasis			
Uterine Fibroids			
Vitamin D deficiency			

5) In general, how often do you or your partner use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during:

	N/A, have never did this sexual activity	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always
Oral Sex						
Vaginal Sex						
Anal Sex						

6) ***Within the last 12 months***, how often did you or your partner use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during:

	N/A, have never did this sexual activity	Have not done this sexual activity in the past 12 months	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always
Oral Sex							
Vaginal Sex							
Anal Sex							

7) ***Within the last 12 months*** did you have oral, vaginal, or anal sex with:

	No	Yes
A steady (main) partner?		
A causal partner?		

8) What is the age of your most recent male sexual partner?
< participants will insert number in blank space>

9) Have you ever had sex while high or on drugs ***in the past 12 months***?

N/A, have never did this sexual activity	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always

10) Have you ever had sex while or after consuming alcohol?

N/A, have never did this sexual activity	Never	Rarely (about 25% of the time)	Sometimes (about 50% of the time)	Most of the time (about 75% of the time)	Always

11) How many sexual partners have you had in your lifetime?

- I am not sexually active
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

12) How many sexual partners have you had ***in the past 12 months***?

- I am not sexually active
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

9) Did you use a condom the last time you had sex?

- Yes
- No

12) Do you have a main sexual partner?
   - Yes
   - No

13) Do you have a causal sexual partner?
   - Yes
   - No

HIV Testing Questions

1) Have you ever been tested for HIV?
   - Yes
   - No
   - I don't know

2) How many times have you been tested for HIV?
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - 10 or more

3) What is the approximate date of your last HIV test?
   - (Insert month year in black space) or
   - I have never been tested

4) What was the location of your most recent HIV test?
   - Private doctor's office
   - School or college
   - Family planning clinic
   - Voluntary counseling and testing site
   - Mobile and outreach community HIV testing event
   - Workplace
   - Religious or faith-based organization
   - At home (self-tested)
   - During blood donation event
   - Other _____ (please specify)

5) If previously tested, how influential were the following reasons in your decision to get tested?

	Not at all influential (1)	Slightly Influential (2)	Moderately Influential (3)	Very Influential (4)	Extremely Influential (5)
New sexual partner					
HIV symptoms					
To know your status					
Blood donation					
New relationship					
Doctor recommended test					
Partner infidelity					
Injection drug use					
Other (please specify)					

6) What is the primary or most important reason why you lasted tested for HIV?
   - o New sexual partner
   - o HIV symptoms
   - o To know your status
   - o Blood donation
   - o New relationship
   - o Doctor recommended test
   - o Partner infidelity
   - o Injection drug use
   - o Other (please specify)

7) If never tested, how influential were the following reasons in your decision not to get tested?

	Not at all influential (1)	Slightly Influential (2)	Moderately Influential (3)	Very Influential (4)	Extremely Influential (5)
I don't want to know my HIV status					
I don't know where to get tested					
I don't have insurance coverage for test					
I am at no risk or low risk for HIV					
I'm in a monogamous relationship					
HIV testing is not confidential					

I am afraid of getting tested for HIV					
Getting an HIV test is too time consuming					
I will be negatively judged if I get an HIV test					
Other (please specify)					

8) What is the primary or most important reason why you have never been tested for HIV?
   - o I don't want to know my HIV status
   - o I don't know where to get tested
   - o I don't have insurance coverage for test
   - o I am at no risk or low risk for HIV
   - o I'm in a monogamous relationship
   - o HIV testing is not confidential
   - o I am afraid of getting tested for HIV
   - o Getting an HIV test is too time consuming
   - o I will be negatively judged if I get an HIV test
   - o Other (please specify)

9) In your opinion, how important is HIV testing?
   - o Extremely important
   - o Very important
   - o Moderately important
   - o Slightly important
   - o Not at all important

Post Test Questions

1) I plan/will/intend to get tested for HIV/AIDS in the next 3 months?
    - No
    - Yes

2) How likely are you to get tested for HIV/AIDS in the next 3 months?
    - Extremely unlikely
    - Moderately unlikely
    - Slightly unlikely
    - Neither likely nor unlikely
    - Slightly likely
    - Moderately likely
    - Extremely likely

3-Item Perceived Risk Scale

1) If you get tested, how likely is it that the test results will be positive?
    - Extremely unlikely
    - Somewhat unlikely
    - Neither likely nor unlikely
    - Somewhat likely
    - Extremely likely

2) How likely is it that you have HIV?
    - Extremely unlikely
    - Somewhat unlikely
    - Neither likely nor unlikely
    - Somewhat likely
    - Extremely likely

3) How likely is it that you will get HIV in the future?
    - Extremely unlikely
    - Somewhat unlikely
    - Neither likely nor unlikely
    - Slightly likely
    - Extremely likely

Perceived Susceptibility	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
It is extremely likely I will get HIV in the future.					
I feel I will get HIV in the future.					
There is a good possibility I will get HIV in the next 10 years.					
My chances of getting HIV are great.					
I am more likely than the average woman to get HIV.					

Perceived Seriousness	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
The thought of HIV scares me.					
When I think about HIV, my heart beats faster.					
I am afraid to think about HIV.					
Problems I would experience if I were HIV positive would last a long time.					
HIV would threaten a relationship with my boyfriend, husband, or partner.					
If I had HIV my whole life would change.					
If I had HIV, I would not live longer than 5 years.					

Perceived Benefits	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
When I get tested for HIV I feel good about myself.					
When I get tested for HIV, I don't worry as much about having HIV.					
Getting tested each year for HIV will allow me to catch it early.					
If I get tested for HIV each year I will decrease my chance of dying from HIV.					
If I get tested for HIV each year I will decrease my chances of requiring radical health treatment if I were to be HIV positive.					
If I get tested for HIV each routinely each year, it will help me to find HIV sooner (if I were HIV positive), than if I were to wait for a doctor to recommend an HIV test.					

Perceived Barriers	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
I feel funny getting tested for HIV.					
Getting tested for HIV during the next year will make me worry about HIV.					
Getting tested for HIV would be embarrassing to me.					
Getting tested for HIV will take too much time.					
Getting tested for HIV will be unpleasant.					
There isn't enough privacy when getting tested for HIV.					

Perceived Health Motivation (cues to action)	Strongly Disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
I want to discover health problems early.					
Maintaining good health is extremely important to me.					
I search for new information to improve my health.					
I feel it is important to carry out activities which will improve my health.					
I eat well balanced meals.					
I exercise at least 3 times a week.					
I have regular health check-ups even when I am not sick.					

Manipulation Checks

1) The HIV testing message I read highlighted the good things that could happen if I get tested for HIV.
    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

2) The HIV testing message I read highlighted the bad things that could happen if I don't get tested for HIV.
    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

HIV Testing Beliefs

3) You expect the results to be negative:
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

4) It will give you the opportunity to practice safe sex:
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

5) You expect it to bring you peace of mind:
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

6) You fear getting the result:
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

Interest in HIV testing

7) Viewing this health message made me think about getting tested for HIV.
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

Message Comprehension

8) The HIV testing message was:
    - Extremely difficult to read
    - Difficult to read
    - Neither hard or easy
    - Easy to read
    - Extremely easy to read

9) The HIV testing message was:
    - Extremely difficult to understand
    - Difficult to understand
    - Neither hard or easy
    - Easy to understand
    - Extremely easy to understand

Emotional Response to Message

10) The message made you feel worried?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

11) The message made you feel fearful?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

12) The message made you feel concerned about yourself?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

13) The message made you feel uncomfortable?
    - Strongly disagree
    - Disagree

- Neither agree nor disagree
- Agree
- Strongly agree

14) The message made you feel concerned about someone else?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

15) The message made you feel concerned about your community?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

16) The message made you feel helpless?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

17) The message made you feel sad?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

18) The message made you feel angry?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

19) The message made you feel hopeful?
    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

Message Credibility

20) The HIV message appeared to come from a trusted source:
    - Strongly disagree

- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Message Relevance

21) The HIV message was relevant to people like me:
- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Message Usefulness

22) The information in the HIV message was useful:
- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Message Attractiveness

23) Overall, how much do you like the way the HIV testing message looked?
- Disliked it
- I mostly disliked it
- I neither disliked or like it
- I mostly liked it
- I liked it

Demographics

1) What is your age in years?
   - (Fill in the blank response will be populated)

2) How would you describe your gender?
   - Male
   - Female
   - Other

3) How would you describe your race?
   - White or European American
   - Black or African American
   - Bi-racial or multi-racial (e.g., Black and other ethnic group/s)
   - American Indian
   - Native Hawaiian or Other Pacific Islander
   - Asian
   - Alaska Native
   - Other

4) Do you identify as:
   - Hispanic
   - Not Hispanic

5) How would you describe yourself? (Sexual orientation)
   - Heterosexual
   - Bisexual
   - Gay or Lesbian
   - Unsure
   - Other

6) What is the highest of education you have completed? *If currently enrolled, mark the previous highest degree received.*
   - No schooling completed
   - Nursery school to 8th grade
   - Some high school, no diploma
   - High school graduate, diploma or the equivalent (for example: GED)
   - Some college credit, no degree
   - Trade/technical/vocational training
   - Associate degree
   - Bachelor's degree
   - Master's degree
   - Professional degree
   - Doctorate degree

7) What is your current level of education?
   - Not in school

- In high school
- Pursing high school diploma equivalent (GED)
- Taking college credit, no degree
- Pursuing trade/technical/vocational training
- Pursing an associate's degree
- Pursing a Bachelor's degree
- Pursing a Master's degree
- Pursing a Professional degree
- Pursuing a Doctoral degree

8) What state do you currently live in?
   - (Fill in the blank response will be populated)

9) About how much income have you and your immediate family members made in the last year before taxes?
   - $0-10,000
   - $10,001-30,000
   - $30,001-50,000
   - $50,001-70,000
   - More than $70,000

10) Do you have medical or health care insurance?
   - No
   - Yes, I obtained it through a health insurance marketplace
   - Yes, I obtained it through a source other than a health insurance marketplace

11) What is your current relationship status?
   - Not in a relationship
   - In a casual relationship
   - In a committed relationship, not living together
   - In a committed relationship, living together

12) What is your current marital status?
   - Single
   - Married/Partnered
   - Separated
   - Divorced
   - Widowed
   - Other

13) If currently in a relationship or marriage, how long have you been with your partner?
   - 1 year
   - 2 years
   - 3 years
   - 4 years
   - 5 or more years

14) Are you currently pregnant or attempting to become pregnant?

- No
- Yes

Social Desirability Scale-17 (SDS-17)

Key: 1=True

2=False

1. I sometimes litter. (R)
2. I always admit my mistakes openly and face the potential negative consequences.
3. In traffic I am always polite and considerate of others.
4. I have tried illegal drugs (for example, marijuana, cocaine, etc.). (R)
5. I always accept others' opinions, even when they don't agree with my own.
6. I take out my bad moods on others now and then. (R)
7. There has been an occasion when I took advantage of someone else. (R)
8. In conversations I always listen attentively and let others finish their sentences.
9. I never hesitate to help someone in case of emergency.
10. When I have made a promise, I keep it – no ifs, ands or buts.
11. I occasionally speak badly of others behind their back. (R)
12. I would never live off other people.
13. I always stay friendly and courteous with other people, even when I am stressed out.
14. During arguments I always stay objective and matter-of-fact.
15. There has been at least one occasion when I failed to return an item that I borrowed. (R)
16. I always eat a healthy diet.
17. Sometimes I only help because I expect something in return. (R)

Exposure of Previous HIV testing message

- Have you ever been exposed to an HIV testing message via the following formats?

	No	Yes
TV/Commercial		
Flyer/poster		
Social Media Platform		
Online source other than Social Media		
Billboard		
Professional Presentation		
Email		
Text Message		
Doctor's Office		
Health Clinic		
Health Fair		
Community Center		
University/School event		
Newspaper		
Brochure		
Other (please specify)		

Vita

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