EVALUATION OF AN INNOVATIVE CONDOM DISTRIBUTION PROGRAM AND POINT-OF-ACCESS MESSAGING TARGETING BLACK COLLEGE WOMEN

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ABSTRACT

DIANE B. FRANCIS: Evaluation of an innovative condom distribution program and point-of-access messaging targeting Black college women
(Under the direction of Seth M. Noar)

Condom access is a major issue on some college campuses in the United States, including Historically Black Colleges and Universities (HBCUs). Lack of access increases risk of adverse sexual health outcomes, especially for young Black women. This project evaluated a structural intervention—a condom distribution program (via dispensers with free condoms) and point-of-access messaging (via posters on the dispensers)—on an all-female HBCU campus in North Carolina.

The three-month intervention occurred between November 2015 and January 2016. We used a pre-post intervention only longitudinal panel design. We recruited N = 195 sexually active students to complete a baseline survey and N = 118 students completed the follow-up survey. The retention rate was 61%.

The majority of students (89%) were aware of the dispensers. Slightly less than half (44%) used the dispensers, and 22% had those condoms with them at follow-up. Students mainly used dispensers to access condoms in the dorm bathrooms (81%, *n* = 42). They felt extremely comfortable using the dispensers, especially when alone. More than 70% (*n* = 38) who took condoms used them for sexual intercourse.

Most students (77%) recognized at least one of the messages that had been posted on the dispensers. They reported that the messages made them feel confident and proud to be taking condoms, and motivated them to take a condom. More than a third of students (38%) talked about the dispensers or messages. Students were most likely to talk to their friends or sexual partners.

Condom acquisition and carrying increased significantly (p <. 05) after the intervention. Perceptions of condom availability and accessibility also increased significantly (p <. 05). Perceptions of condom acceptability and norms did not change. Condom intentions and use decreased significantly among the sample as a whole. In multivariate analyses, dispenser use was associated with greater condom use.

This study provides empirical evidence that condom distribution and safer sex messaging can improve perceptions of condom access (particularly availability and accessibility) and impact condom preparatory behaviors (acquisition and carrying). The findings add to our understanding of HIV/STI prevention interventions targeted at young Black women on an HBCU campus.

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Introduction

The period from late adolescence to early adulthood—sometimes referred to as emerging adulthood—is a time marked by numerous transitions: chronological, biological, psychological, social, and role-related. In the United States, the pathway from adolescence to adulthood is increasingly marked by the transition from high school to college. As of 2015, approximately two million Blacks[1] between the ages of 18 and 24 attended four-year colleges and universities (Krogstad & Fry, 2014). Historically Black Colleges/Universities (HBCUs) enrolled about 300,000 students in 2015, and 50% were Black females (National Center for Education Statistics, 2016).

Emerging adulthood is also a time when young people are engaging in sexual activity (Finer & Philbin, 2013). The average age of first sexual intercourse for Black adolescents is about 15 years (Biello, Ickovics, Niccolai, Lin, & Kershaw, 2013). By their 16th birthday, 55% of Black females were likely to have had their sexual debut (Cavazos-Rehg et al., 2009). Early adolescent sexual debut is associated with postsecondary education for females such that the earlier someone initiates sexual intercourse, the less likely they are to go to college (Spriggs & Halpern, 2008). However, early sexual debut does not preclude advancement to college. In one study of more than 7,000 HBCU students, 14% reported sexual initiation by age 13, 52% by age 15, and 73% by age 19 (Wang, Storr, Browne, & Wagner, 2011).

[1] Black and African American are used interchangeably throughout this document.

Consistent condom use remains low among adolescents and young adults (Buhi, Marhefka, & Hoban, 2010; Gurman & Borzekowski, 2004; McCave, Azulay Chertok, Winter, & Haile, 2013). Data from a national sample of U.S. college students show that only 42% of Black students reported always using a condom during vaginal intercourse in the previous 30 days (Buhi et al., 2010). In another study, less than one-third of college students said they always used a condom for vaginal intercourse (McCave et al., 2013). A study of HBCU students showed that among the 64% of HBCU students who used condoms at last sexual intercourse, 49% were females (El Bcheraoui, Sutton, Hardnett, & Jones, 2013). HBCU students who reported using condoms for disease prevention were more likely to have used condoms than those reporting using them for pregnancy prevention (El Bcheraoui et al., 2013).

Early sexual initiation, frequent sex, and inconsistent condom use are important risk factors for sexually transmitted infections (STIs), and may contribute to persistent sexual health disparities between Blacks and Whites. Among all women in the United States, for example, Black heterosexual women are the group most affected by HIV (Centers for Disease Control and Prevention, 2016). This disparity persists despite a reported 42% *decrease* in new HIV infections among Black women in the past decade (Centers for Disease Control and Prevention, 2016). STI disparities are especially pronounced among young people ages 15-24 years, despite being a smaller proportion of the sexually active population (Centers for Disease Control and Prevention, 2015b). The gonorrhea rate for Black females in that age group is 10 to 13 times that of White females; the chlamydia rate for Black females is four to five times that of White females (Centers for Disease Control and Prevention, 2015b).

Consequently, the period between late adolescence and young adulthood is a critical time to establish healthy behaviors in young people. This includes preparatory safer sex behaviors such as obtaining and carrying condoms—a prerequisite to using

condoms. Research demonstrates that condom preparatory behaviors are associated with increased condom use (Bryan, Fisher, & Fisher, 2002; Carvalho, Alvarez, Barz, & Schwarzer, 2015). Individuals, however, cannot obtain, carry and ultimately use condoms if there are significant environment constraints (Fishbein & Cappella, 2006), and condom access remains an issue for some young people.

Condom access is of particular concern to young African Americans, who are already at higher risk of acquiring STIs. African Americans may be more likely to live in condom deserts—places with low condom availability and meager sexual health resources (Shacham, Nelson, Schulte, Bloomfield, & Murphy, 2015). Recent research shows an inverse association between availability of condoms and sexually transmitted infections (Shacham, Nelson, et al., 2015; Shacham, Thornton, Godlonton, Murphy, & Gilliland, 2015). Using data from the St. Louis, Missouri, region, Shacham and colleagues found that geographic regions with less available condoms have higher gonorrhea, chlamydia, and HIV rates (Shacham, Nelson, et al., 2015). Thus, differences in condom availability in the United States may explain some of the disparities in sexual health outcomes (Shacham, Nelson, et al., 2015; Wilson & Ickes, 2015).

Evidenced-based interventions to improve sexual health outcomes for young Black women are urgently needed. Health campaigns and condom distribution programs are among a myriad of approaches currently being tested (Centers for Disease Control and Prevention, 2015a). The research to date points to several gaps, however. First, while health campaigns can motivate psychosocial and behavior change, they do not address condom access directly. Second, while condom distribution programs can address condom access, especially condom availability and accessibility, they often fail to address or even consider condom acceptability (i.e. embarrassment when obtaining condoms), even when social marketing campaigns are conducted. Third, these interventions have rarely targeted the college environment. Considering the large

number of young Black women currently enrolled at colleges across the U.S., it is possible that many of them are acquiring STIs in their campus communities (Gonzalez-Barrera & Lopez, 2014). Consequently, interventions that address all aspects of condom access for college-aged Black women are warranted.

The purpose of this study was to develop, implement and evaluate a condom distribution intervention and point-of-access messaging targeting young Black women attending an all-female Historically Black College in North Carolina. The intervention combined campus-wide condom distribution (via condom dispensers with free condoms) and messages on the dispensers to increase condom acquisition and ultimately increase condom use.

The HIV/STI Epidemic Among Young Black Women

At the national level, Black women account for a disproportionate number of persons infected with HIV, a trend that began in the mid-1990s. The number of new HIV infections among Black women in the US declined more than 40% between 2005 and 2014 (Centers for Disease Control and Prevention, 2016). Black women, however, still account for 29% of all new infections among Black adolescents and adults, with rates 20 times that of White women in the U.S. (Centers for Disease Control and Prevention, 2015a). Put another way, two-thirds of new HIV infections among women in the U.S. occur in Black women, despite the fact that Black women represent only 14% of the female population.

Black women are also disproportionately at risk for other sexually transmitted infections such as chlamydia and gonorrhea (Centers for Disease Control and Prevention, 2015b). In 2012, the chlamydia rate for Black women was 1613.6 cases per 100,00 cases; for White women, the rate was 260.5 cases per 100,000 cases. Black women had the highest rate of chlamydia among all cases. Rates of gonorrhea were also high among Black women: 456.5 cases per 100,000. Thus, Black women were 14

times more likely to have gonorrhea and six times more likely to have chlamydia than White women (Centers for Disease Control and Prevention, 2014).

The HIV/STI epidemic is primarily concentrated in the certain regions of the country. The South, in particular, experienced the highest HIV infection rates in 2010 among the four main regions of the U.S. (Prejean et al., 2011), where eight of the 10 states with the highest HIV rates were in the South (Centers for Disease Control and Prevention, 2013b). Further, 15 of the top 20 Metropolitan Statistical Areas (MSAs) with the highest rates of HIV diagnoses in 2010 were in nine southern states (Centers for Disease Control and Prevention, 2013b).

At the state level, North Carolina ranked 12th among 45 states and territories reporting new HIV diagnoses (17.8 per 100,000 population) and the adolescent/adult rate of new HIV diagnoses for Blacks was 62.8 per 100,000 (N.C. Department of Health & Human Services, 2015). This overall diagnosis rate for Blacks is almost 10 times higher than Whites. Additionally, the HIV diagnosis rate was 31.9 per 100,000 among Black females (N.C. Department of Health & Human Services, 2015). Thus, in 2014, Black females were 19 times more likely to contract HIV than their White counterparts in North Carolina (N.C. Department of Health & Human Services, 2015).

Several individual-level factors contribute to HIV/STI risk among Black women, including age of first sexual intercourse, inconsistent condom use, and low HIV/STI risk perceptions (Pflieger, Cook, Niccolai, & Connell, 2013; Sutton et al., 2011). In a study evaluating perceptions of sexual risk among Black female college students, Annang, Johnson, and Pepper-Washington (2012), found the majority of students did not perceive their partners, and therefore themselves, to be at high risk for STIs. In fact, only 6% of students considered their partners to be at high risk for STIs. Such perceptions may help explain the low consistent condom use among this population (Buhi et al., 2010; Younge, Corneille, Lyde, & Cannady, 2013). Individual risk factors for HIV/STIs

appear to be similar for black female students at public institutions and HBCUs—inconsistent condom use, increased number of sex partners, not getting tested (Buhi et al., 2010; Impett, Breines, & Strachman, 2010; Shegog, Lindley, Thompson-Robinson, Simmons, & Richter, 2012). Protective factors such as HIV/STI knowledge, HIV testing, and alcohol and drug abstinence, also appear to be as high or higher for Black students than other groups. Despite this, some Black HBCU students report higher rates of lifetime STIs (Younge et al., 2013).

Contextual factors may also contribute to HIV/STI risk. Contextual factors include lack of access to adequate sexual health products and services (such as condoms), lower social status, financial dependence on male partners, and sexual mixing patterns (Adimora, Ramirez, Schoenbach, & Cohen, 2014). As suggested before, African Americans may live in places where they are less likely to have access to condoms and other sexual health resources (Shacham, Nelson, et al., 2015). Black students may also be more likely to attend colleges and universities with limited resources on campus, including HBCUs (Warren-Jeanpiere, Jones, & Sutton, 2011; Warren-Jeanpiere, Sutton, & Jones, 2011). Access to condoms particularly, may be an important structural-level factor that increases risk for HBCU students (Warren-Jeanpiere, Sutton, et al., 2011; Younge et al., 2013). In a study about HBCU campus culture and sexual health, Warren-Jeanpiere, Sutton, et al. (2011) found although condoms were available, the distribution sites lacked privacy and confidentiality. Additionally, some schools controlled the distribution and acquisition of condoms: students could only acquire a limited number of condoms each time (Warren-Jeanpiere, Sutton, et al., 2011). HBCU health administrators also agreed campus restrictions on condom distribution was a barrier to HIV/STI prevention and increased students' risk of acquiring those diseases (Warren-Jeanpiere, Jones, et al., 2011). Structural impediments to condom access for HBCU students may lead to what Younge et al. (2013), in their review of HBCU students and

sexual health, called the ‘paradox of risk’. Black adolescents and young adults engage in similar or less risky sexual behaviors than their White peers but experience higher rates of STIs (Younge et al., 2013).

Interventions to Address HIV/STI Among Young Black Women

Considering the disproportionate numbers of young Black women affected by HIV/STIs, and the individual and contextual factors affecting their risk, behavioral and structural interventions are still needed. Behavioral interventions are “interventions designed to affect the actions that individuals take with regard to their health” (Cutler, 2004). Johnson et al. (2009) conducted a meta-analysis of 78 behavioral interventions to assess their impact on sexual risk behaviors among Blacks. Such interventions proved efficacious at increasing condom use among intervention participants compared to controls (Johnson et al., 2009), with effect sizes for condom use ranging from d = .12 to .20. This meta-analysis also found short-term interventions (about 3 months) to be efficacious. Another meta-analysis of 39 studies evaluated the efficacy of behavioral interventions specifically for Black women in the United States (Crepaz et al., 2009). The results indicated these interventions were also efficacious in not only reducing self-reported risk behaviors but also STIs. The most successful interventions specifically targeted Black females, used culture- and gender-specific intervention materials, and empowered women by addressing protective behaviors (Crepaz et al., 2009).

Structural-level interventions are interventions that change the underlying political, economic or social environments within which health behaviors are enacted (Blankenship, Friedman, Dworkin, & Mantell, 2006). In a meta-analysis of structural-level community-based condom distribution programs, such interventions were efficacious in not only improving the availability of condoms, but also increasing condom acquisition, carrying, and use (Charania et al., 2011). Evaluations of high school-based condom distribution programs have also shown promising results. For instance, studies have

demonstrated increased condom use at last intercourse among adolescents following introduction of condom availability programs at their schools (Blake et al., 2003; Guttmacher et al., 1997). One study found that making condoms available was associated with a decrease in STI cases among adolescent males aged 15-19 years (Wretzel, Visintainer, & Pinkston Koenigs, 2011). Previous research indicates becoming aware of condom availability programs (De Rosa et al., 2012) and obtaining school condoms (Guttmacher et al., 1997; Schuster, Bell, Berry, & Kanouse, 1997) was associated with increased condom use.

Communication campaigns occupy a space at the intersection of behavioral and structural interventions. Several of the condom distribution programs evaluated by Charania et al. (2011) included communication activities such as poster distribution and mass media campaigns. An example of this is the intervention “Hombes Sanos.” An HIV prevention campaign targeting Spanish-speaking men who have sex with men, “Hombres Sanos” sharply increased safe sex practices by simultaneously distributing free condoms and promoting condom use via broadcast media, print materials, transit ads, and activities at local venues (Fernandez Cerdeno et al., 2012; Martinez-Donate et al., 2009; Martinez-Donate et al., 2010).

Structural approaches to HIV prevention remain understudied. Additionally, evidence from the United States for structural interventions targeting Black female adolescents and young adults, is lacking. Of the 21 condom distribution interventions evaluated by Charania and colleagues (2011), only seven were conducted in the United States. Just two studies had a majority Black population (Cohen, Dent, MacKinnon, & Hahn, 1992; Cohen et al., 1999); one study was 100% female and 45% were Black (Cohen et al., 1999). Little research exists on the effectiveness of distributing condoms on college campuses in general or HBCUs in particular. Thus, it is unclear whether this

approach would be efficacious in increasing condom use among Black college-attending women.

Project Belles: Condom Distribution Program and Point-Of-Access Messaging

Project Belles was an innovative, longitudinal intervention that combined condom distribution (via dispensers with free condoms) with point-of-access health messaging (posters on the dispensers) to address condom access among college-aged Black women. The target population was young Black women attending an all-female HBCU in the Southern United States. The project used a one-group, pre-post quasi-experimental design to examine effects of the intervention. In particular, the study examined: (1) changes in women's perceptions of the availability, accessibility and acceptability of condoms on campus, as well as use of condoms, three months after implementation of the condom distribution program; (2) the influence of exposure to the point-of-access messaging on condom acceptability and condom norms; and (3) the role of interpersonal communication after the program.

The study was conducted at a small, all-female, religiously affiliated, HBCU in North Carolina. In Fall 2014, 98% of students were under 24 years of age, and 86% were Black (National Center for Education Statistics, 2016). The school enrolled students from North Carolina as well as several other states, including Georgia, Maryland, Florida, and Washington D.C. (Bennett College, 2014); these mostly southern states experience some of the highest burdens of HIV and other STIs in the United States (Centers for Disease Control and Prevention, 2015b). Most of the North Carolina students at Bennett college were from Durham, Wake, Mecklenburg, and Guilford counties (Bennett College, 2014)—counties with high rates of HIV and other STIs among young Black persons (N.C. Department of Health & Human Services, 2015). Eighty-eight percent of students received Pell grants for the 2013-2014 school year, (National Center for Education Statistics, 2016), suggesting that most students came from economically

disadvantaged (i.e. low socioeconomics, SES) families. Young women attending the college are similar to those attending other HBCUs in North Carolina: more than 80% of NC HBCU students receive Pell grants, and the majority have a primarily young, female student body (National Center for Education Statistics, 2016). These data suggest that, much like students at the college, many students at other HBCUs also come from low SES families. Low SES has been shown to be a significant risk factor for HIV.

This study builds on prior and existing safer sex initiatives at the college. Prior to the study, the college campus did distribute condoms to students (McDonald-Finch, 2015). However, the scope of the distribution was quite limited. Male and female condoms were primarily available at the campus health center and from dorm resident directors. At the health center, condoms were placed in bowls in the waiting area. This means condoms were in view of other students and health center staff. The limited availability of condoms and control of distribution through other persons are not surprising. One study on the sexual health environment at colleges across the U.S. revealed schools with large student populations and public institutions were much more likely to distribute condoms than institutions classified as small or faith-based institutions (Butler, Black, & Coster, 2011; Butler, Procopio, & Black, 2014).

Theoretical Approach

The current study draws on the integrative model of behavioral prediction (Fishbein, 2000; Fishbein & Yzer, 2003) and the theory of gender and power (Wingood & DiClemente, 2000).

The integrative model of behavioral prediction, like the theories of reasoned action and planned behavior, suggests that intention is the primary determinant of performing a particular behavior (Fishbein & Yzer, 2003). Intentions are a function of attitudes, perceived norms and self-efficacy. Attitudes refer to a person's positive and negative evaluations regarding the behavior; perceived norms are a person's

perceptions of what important others want them to do as well as what others in their community are doing, and self-efficacy refers to confidence that a person feels in performing a behavior. Underlying beliefs influence attitudes, perceived norms and self-efficacy (Fishbein & Yzer, 2003), and such beliefs are developed from a range of demographic, personal and societal factors. The integrative model of behavioral prediction differs from theory of planned behavior mainly because of the inclusion of two additional constructs. The integrative model suggests that environmental factors and skills are important in determining whether a person performs a particular behavior. The theory suggests that if a person has an intention to perform a particular behavior (such condom use) but encounters environmental constraints (such as lack of access to condoms) then it is highly unlikely that the behavior will be performed.

The theory of gender and power is a social structural model that aims to understand Black women's risk as a function of three separate but interrelated structures (Wingood & DiClemente, 2000): The sexual division of labor, the sexual division of power and the structure of social norms and affective attachments (Wingood & DiClemente, 2000). The sexual division of labor examines economic inequities that favor males such as unequal pay between men and women who perform the same work. The sexual division of power examines inequities and abuses of authority and control in relationships and institutions. This creates a power imbalance within relationships. The structure of social norms and affective attachments is particularly relevant to the current study. Expectations about who should be responsible for obtaining and keeping condoms, and beliefs that women who carry condoms are promiscuous are within the structure of social norms and affective attachments. Wingood and DiClemente (2000) posit HIV risk behavior is influenced by beliefs about how women should behave in society. For example, societal beliefs such as women who obtain condoms are promiscuous may hinder a woman's desire to carry condoms, reducing her ability to

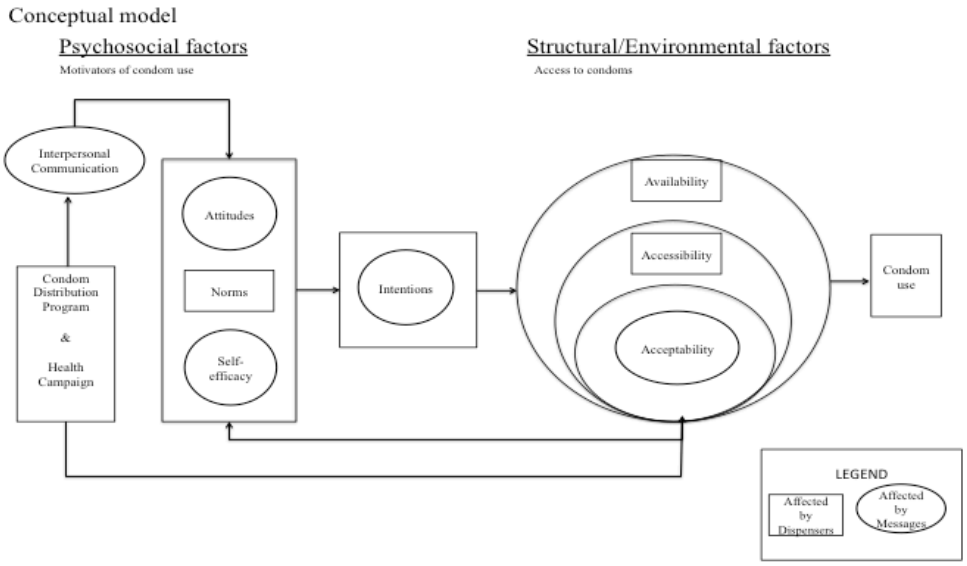
protect herself. They also suggest conventional religious beliefs about safer sex and negative attitudes about HIV may influence a woman's HIV risk behaviors.

Intention-Action Conceptual Model

The intention-action conceptual model guides this study. The conceptual model is based on the integrative model of behavioral prediction (Fishbein, 2000; Fishbein & Yzer, 2003), the theory of gender and power (Wingood & DiClemente, 2000), prior research on structural-level condom distribution programs (Blankenship et al., 2006; Charania et al., 2011), and communication approaches to HIV prevention (Noar, Palmgreen, Chabot, Dobransky, & Zimmerman, 2009). The model holds that the psychosocial variables of condom-related attitudes, norms and self-efficacy are primary determinants of intentions to use condoms, and that intentions are a primary determinant of condom use. Second, the model proposes that the relationship between intentions to use condoms and condom use is influenced by the extent to which the environment facilitates or constrains condom access (i.e., condom availability, accessibility, and acceptability). Third, the model suggests that the environmental factors, in turn, may influence condom attitudes, norms and self-efficacy (e.g., if condoms are more available, one's perceptions of norms of use may be higher).

Placement of free condom dispensers in highly trafficked locations is expected to address issues related to condom availability and accessibility. Messages targeting condom acceptability (i.e. embarrassment, stigma of obtaining, and carrying condoms) may also affect condom norms. Figure 1 indicates the factors that may be affected by the dispensers themselves (indicated by a square), and the ones that may be affected by the messages (indicated by a circle).

Figure 1: Conceptual Model



Dissertation Plan

In this dissertation, Chapter 2 reports the evaluation of the condom distribution program (via condom dispensers with free condoms). All students who were enrolled in the Fall 2015 were eligible to participate in the baseline questionnaire. We used a pretest-posttest panel design to evaluate changes in perceptions of the availability, accessibility and acceptability of condoms on campus, and use of condoms, over a 3-month period after implementation of the condom distribution program. This chapter also assesses awareness and use of the dispensers.

In Chapter 3, the effects of the point-of-access messages are explored. This chapter specifically assesses the impact of exposure to the messages and perceived message effectiveness on psychosocial and behavioral outcomes.

In Chapter 4 interpersonal communication about the combined intervention is examined, specifically addressing whether talking about the intervention affected perceptions of condom acceptability and condom norms.

In Chapter 5, implications of these results for sexual health promotion among college-aged young Black females are discussed.

CHAPTER 2

Effects of a condom distribution program on safer sex perceptions and behavior among Black HBCU women

Introduction

Condoms can prevent the transmission of many sexually transmitted infections. Limited availability and accessibility to condoms, and psychosocial barriers to condom acquisition (i.e. acceptability) may hinder their use. Condom distribution programs and communication campaigns can be efficacious in improving condom access (availability, accessibility and acceptability), condom preparatory behaviors (acquisition and carrying), and condom use (Charania et al., 2011). This paper reports the findings of an innovative, longitudinal intervention to increase condom access and use among young Black women attending an all-female Historically Black College in the Southeastern United States. Condoms were distributed via condom dispensers, and each dispenser displayed a poster with safer sex messaging. In particular, this paper focuses on (1) awareness and use of the condom dispensers; (2) changes in perceptions of condom availability, accessibility and acceptability of condoms; and (3) changes in condom norms, intentions and use.

Condom Access: Availability, Accessibility and Acceptability

Three concepts in the domain of condom access—availability, accessibility, and acceptability—are important to understanding condom use (Blankenship et al., 2006; Charania et al., 2011). *Availability* refers to how much condoms are physically available in one's environment. *Accessibility* refers to how easy or hard it is to obtain such condoms. *Acceptability* is the degree of comfort (or embarrassment) one feels when obtaining condoms. All three concepts are inter-related. To obtain condoms, a person needs to: have

condoms physically available in their environment (availability); know where to go to get them (accessibility); and be comfortable obtaining condoms in their environment (acceptability). Any of these factors could pose significant barriers to obtaining condoms. Thus, attending to the availability, accessibility, and acceptability of condoms could facilitate condom access and use.

Availability of condoms may be a particular challenge for students attending Historically Black Colleges/Universities (HBCUs). In past studies, students have described difficulties obtaining condoms on campus, and when condoms are available, it is usually on a limited basis (Warren-Jeanpiere, Jones, et al., 2011; Warren-Jeanpiere, Sutton, et al., 2011; Younge et al., 2013). One study found that while the majority of college health centers in the United States offered male latex condoms to students, private and faith-based institutions were least likely to have condoms available (Butler et al., 2011). Additionally, the limited number and type of condoms distributed may not meet the sexual health needs of young women (Butler et al., 2011). The limited availability of condoms in some cases or the control of the distribution of condoms in other cases may make it difficult for college women to obtain condoms when needed (Warren-Jeanpiere, Jones, et al., 2011; Warren-Jeanpiere, Sutton, et al., 2011).

Even when condoms may seemingly be available on college campuses, they may not be easily accessible. That is, some students may not know where to get condoms on campus. In a recent study, less than half of African American female teens said they were confident they could get a condom when one was needed (Carmack, Lewis, & Roncancio, 2015). In another study, Black college students said they did not know that their HBCU campus health clinics provided free condoms (Warren-Jeanpiere, Jones, et al., 2011; Warren-Jeanpiere, Sutton, et al., 2011).

Finally, embarrassment about (or lack of comfort) obtaining condoms within some college environments may preclude acquiring and using condoms. Students at HBCUs

reported feeling embarrassed, and some feared the lack of confidentiality when obtaining condoms from some condom distribution sites (such as campus health centers) (Warren-Jeanpiere, Sutton, et al., 2011). This is because condoms are usually distributed in open spaces such as at a nurse's desk, which may present opportunities for young persons to feel shame or discomfort when obtaining condoms (Warren-Jeanpiere, Jones, et al., 2011; Warren-Jeanpiere, Sutton, et al., 2011). Embarrassment when obtaining condoms may be particularly the case for young women (Francis et al., 2016). Studies show that embarrassed persons obtained, carried and used fewer condoms than those who were not embarrassed (Kelly, 1996; S. G. Moore et al., 2008; Ronis & LeBouthillier, 2013). Combined, these factors—availability, accessibility, and acceptability—affect one's ability to obtain and use condoms, and may increase risk of adverse sexual health outcomes (Bell, 2009; S. G. Moore, Dahl, Gorn, & Weinberg, 2006; S. G. Moore et al., 2008).

To date, condom access has been given little attention in the HIV/STI prevention literature, as so many interventions focus solely on motivating condom use through individual-level changes in psychosocial variables (often with a lack of environmental changes). This despite evidence suggesting condom distribution is associated with greater condom use, and the growing evidence on the efficacy of condom distribution programs (Charania et al., 2011). In prior studies, becoming aware of condom availability programs (De Rosa et al., 2012) and obtaining school condoms (De Rosa et al., 2012; Wretzel et al., 2011) was associated with increased condom use. Condom use at last intercourse also increased among adolescents following the introduction of condom distribution programs at their schools (Blake et al., 2003); STIs also decreased (Wretzel et al., 2011). Evaluations of community-based condom distribution programs have also shown positive results (Burke et al., 2009; Burke et al., 2011; Des Jarlais et al., 2013).

Empirical research clearly suggests that making condoms more available and accessible while increasing condom acceptability (i.e. reducing embarrassment) can and

does affect actual condom use among adolescents and young adults (S. G. Moore et al., 2006; Sheeran, Abraham, & Orbell, 1999). However, few findings have been reported for condom distribution interventions at U.S. colleges. Studies of condom and other sexual health resources on college campuses have primarily described the sexual health environments (Butler et al., 2011; Butler et al., 2014; Eisenberg, Lechner, Frerich, Lust, & Garcia, 2012; Warren-Jeanpiere, Sutton, et al., 2011). For example, a survey of condom distribution methods at 378 U.S. colleges and universities found that while 96% of schools offered condoms at student health centers, only 26% offered condoms at those locations after hours (Butler et al., 2011). Only 13% of schools distributed condoms through dispensing machines, and 9% made condoms available in bathrooms (Butler et al., 2014). Hence, increasing both *actual* and *perceived* ease of condom access is important for college-aged persons.

The purpose of this study was to assess the effectiveness of the condom distribution program and point-of-access messaging to increase condom access among college-aged Black women. The integrative model of behavioral prediction and theory of gender and power guided the intervention. The intervention was conducted at a small, all-female, religiously affiliated, HBCU in North Carolina, and builds on prior and existing sexual health initiatives at the college. The intervention began on November 1, 2015 and concluded on January 31, 2016. The intervention consisted of two main components: condoms (and lubrication) were distributed in dispensers installed in campus bathrooms, and posters with messages were placed inside the dispensers (Figure 2). We hypothesized increases in perceptions of condom availability, accessibility, and acceptability at follow-up when compared to baseline (H1); higher condom norms, intentions and use at follow-up compared to baseline (H2); and that dispenser use and condom availability, accessibility, and acceptability will be associated with condom intentions and use at follow-up (H3).

Figure 2: Condom Dispenser and Safer Sex Messaging

Formative Research and Intervention Design

Prior to launching the intervention, we conducted systematic formative research to develop the messages (See Appendix A for examples of the posters). We began the process by identifying our target audience of Black college women, and the specific site for the intervention—a Historically Black College in North Carolina. In a prior study, we found females to report greater embarrassment than males in procuring condoms after implementation of condom dispensers on a college campus (Francis et al., 2016). Thus, it was important to develop messages targeted at females to increase comfort with taking and carrying condoms.

To develop and test the messages, we conducted six focus groups (n=40) in two phases with HBCU female students. In order to not "contaminate" the forthcoming study, we conducted this formative work at a different HBCU campus than where we implemented the condom dispensers. All focus group participants signed informed consent and received $15 gift cards. Female members of the research team conducted the focus groups.

The first phase explored perceptions about condom access within the college environment and potential messaging ideas. In an iterative analysis process, we identified

salient beliefs about condom access, norms, and acceptability. We worked with a creative advertising team at the University of North Carolina at Chapel Hill School of Media and Journalism to draft two message concepts. The first concept used emojis (popular cartoon-like characters and symbols) and a females' hand holding a condom. The second concept presented scripted messages (e.g. "There is nothing like being well packaged") on a chalkboard background.

In the second phase, we conducted two additional focus group discussions to elicit feedback on the draft messages. Participants answered open-ended questions about attention, comprehension, credibility, cognitive and emotional reactions, personal relevance, perceived effectiveness, and overall appeal to HBCU students. In general, students preferred the concept with the script on the chalkboard, perceiving it as a message that would catch their attention and encourage them to take condoms, and as something they would remember and share with their friends. Students further said they would feel comfortable obtaining condoms from the dispensers if the scripted messages were displayed. They perceived the emoji-based concepts as interesting but not something that would motivate them to take a condom. Students suggested ways of enhancing the chalkboard message concept, changing the colors of the posters to be more appealing, and simplifying the call to action. We revised initial messages according to the focus group feedback. Finally, we elicited feedback from key target audience informants at the intervention college. The final concept included four messages – each representing a different execution of the same theme – which was an empowering message to protect oneself, but delivered in a playful manner. The final messages used humor as a tool to attraction attention and persuasion (Markiewicz, 1974).

With our assistance and input, the campus health center staff at the participating school – led by the Health Center Manager – supervised the implementation and dissemination of intervention materials. We provided 10 dispensers, 10 posters with health

messages, 15,000 condoms, and 5000 lubrication packets. The college's staff installed the dispensers on November 1, 2015, mostly in bathrooms around campus. Nine dispensers were placed in bathrooms in four dormitories; one dispenser was placed in the campus health services building. Each dispenser holds about 120 condoms, and dorm resident directors and assistants checked and refilled the dispensers as needed. At the beginning of the project, the dispensers were filled with Trojan Lubricated® and Trojan Magnum® condoms. Halfway through the project, Trojan Ecstasy® and lube were added to the mix. At the end of the 3-month intervention period, we counted all condoms that had not yet been used. Of the 15,000 condoms provided, about 13,021 remained at follow-up. Thus, 1,979 condoms were distributed during the intervention, or about 164.9 condoms per week.

Methods

Participants and Procedures

The study used a one-group, pre-post quasi-experimental panel design to evaluate the intervention. We collected baseline surveys at a central campus location (i.e. student union lobby) over a nine-week period immediately before implementing the intervention. Prospective students were told this was a pre-post sexual health survey, but no mention of condom dispensers took place until it was asked about in the follow-up survey (in order to blind the evaluation purpose of the study). Six trained graduate research assistants (working in pairs) approached all students who entered the student union and asked if they wanted to hear about a study opportunity. Persons who said yes were provided a brief description of the study. If students were still interested in participating, they were given a screening form to assess eligibility. In order to be eligible to participate in the study, participants had to be: (1) currently enrolled at the targeted college; (2) 18 years of age or older; (3) self-identified as Black or African American; and (4) heterosexually active in the past 12 months. Interested and eligible students were given an iPad to read the informed consent document, which was the first page of the survey. After consenting to being in the study, students then

completed the anonymous baseline survey. When done taking the baseline survey, respondents were given a separate iPad to input their contact information (name, email address, mailing address, and phone number) for communicating with them about the follow-up survey. The condom dispensers were implemented immediately after all baseline data collection was complete.

Participants completed the follow-up surveys on their personal computing devices three months after the intervention began. Follow-up data collection took three weeks to complete. We first sent participants an initial email containing a link to take the survey, and a text message alerting them of the start of data collection. Participants then received up to six reminder emails, three reminder text messages with links to take the survey, and two phone calls. In total, participants received between one and 13 contacts depending on when they completed the survey and their preferred method of communication (email, text messaging and phone calls). (See Appendix B for a chart with the timeline and number of contacts at follow-up.) We piloted both surveys prior to data collection. The duration for both surveys was approximately 15 minutes. Participants received a $10 gift card at baseline and $15 gift card at follow-up as incentives. At baseline, the gift card was delivered in person, while at follow-up the gift card was delivered over email.

Of the 327 people approached at baseline, 105 were ineligible (one was not currently enrolled at the targeted college, seven were under 18 years of age, two did not identify as Black or African American, and 95 were not sexually active in the past 12 months), and 27 refused participation. The final sample included 195 individuals at baseline—indicating a response rate of 88%. At follow-up, 118 participants completed the survey—indicating a retention rate of 61%. The Institutional Review Boards at the University of North Carolina at Chapel Hill and Bennett College approved the study.

Measures

The questionnaires comprised demographic variables, variables assessing awareness and use of the dispensers, condom access, and condom intentions and use.

Demographics were measured at baseline and included age (measured continuously), ethnicity (Hispanic/non-Hispanic), residence (on campus or off campus), and current year in school. Participants also reported contraceptive use (birth control and emergency contraceptive) and partnership type (main or casual partners) and partner characteristics (age, education).

Sexual behavior was measured by asking participants, “In total, how many sexual partners have you had in the past 3 months?” Any participant who reported having had oral, vaginal or anal sex with one or more persons in the prior three months was reported as being currently sexually active.

Dispenser awareness was measured with one question taken from verbatim from a prior study (Francis et al., 2016): “Have you seen, in person, any of the new condom dispensers?” (1 = Yes, 0 = No.). Prior to answering that question, participants viewed a picture of the dispensers.

Dispenser use was also measured with one item: “In the past 3 months, did you ever use the condom dispensers?” (1 = Yes, 0 = No).

We measured whether participants were *carrying condoms*. At baseline, they were asked, “Are you carrying condoms with you right now (e.g. in your pocket, wallet, or purse)?” (1= Yes, 0 = No). At follow-up, they were asked whether they were carrying condoms that they took from the dispensers.

We also assessed *other places where they obtained condoms*. At baseline, participants were asked, “In the past 3 months, from which of the following places have you obtained condoms (for example: bought them for free)?” Options were: campus health services; non-university health clinic; residence hall; pharmacy, convenience store or

grocery store; campus event; and other. At follow-up, participants were asked to indicate places other than the dispensers from which they obtained condoms.

We assessed what participants did with the condoms they took from the dispensers. Participants were asked, “How many of the condoms that you took from the dispensers would you say you or your partner used?” and, “How many of the condoms that you took from the dispensers did you give away?” (None, a few, some, a lot, all of them). Responses were dichotomized (1 = a few or more, 0 = none).

Comfort with the dispensers was measured with 3 items, assessed separately: “In general, how comfortable do you feel using the dispensers? How comfortable do you feel using the dispensers when you are alone? How comfortable do you feel using the dispensers when someone is watching?” (1=Extremely uncomfortable to 5=Extremely comfortable).

Availability was measured with two items adapted from a previous study (Francis et al., 2016). *General availability* was measured by asking, “In your opinion, how available are condoms on the Bennett College campus?” *Location availability* was measured by asking, “How often would you say you pass by a location where you can pick up a condom for free on campus?” These items were measured on a five-point Likert-type scale (1=not at all available, to 5=extremely available) and assessed separately.

Accessibility was measured with three items (Cronbach’s alpha was .89 at baseline and .89 at follow-up) also from a prior study (Francis et al., 2016): (1) “If you were looking for a condom today on campus, how sure are you that you would know where to go?”; (2) “If you were looking for a condom today on campus, how sure are you that you would be able to get one?” and (3) “If you were looking for a condom today on campus, how difficult or easy would it be to get one?”. The first two items were measured on a five-point Likert-type scale (1=extremely unsure, to 5=extremely sure); the third item, was also measured on a five-point Likert-type scale (1=extremely difficult, to 5=extremely easy).

Acceptability was measured with six items (Cronbach's alpha was .93 at baseline and .93 at follow-up) adapted from the UCLA Multidimensional Condom Attitudes Scale (Helweg-Larsen & Collins, 1994): (1) "It is very embarrassing to obtain condoms"; (2) "When I need condoms I often dread having to get them; (3) I think that obtaining condoms is awkward"; (4) "It would be embarrassing to be seen buying condoms in a store"; (5) "It would be embarrassing to be seen picking up free condoms"; (6) "I always feel uncomfortable when I have to get condoms" (1=strongly disagree to 5=strongly agree). Values were recoded so that higher numbers are positive.

Condom norms were measured with four items (Cronbach's alpha was .85 at baseline and .82 at follow-up): "How many of your female friends do you think…(1) talk about condoms with their sexual partners; (2) use condom during sexual intercourse; (3) carry condoms with them (4) get their own condoms" (1=none to 5=all).

Acquisition intentions were measured with a single item: How unlikely or likely is it that you will obtain condoms during the next 3 months (1=extremely unlikely to 5=extremely likely).

Carry intentions were measured with a single item: How unlikely or likely is it that you will carry condoms during the next 3 months" (1=extremely unlikely to 5=extremely likely).

Condom use intentions were measured with two items (Cronbach's alpha was .90 at baseline and .90 at follow-up): "How unlikely or likely is it that you will…(1) use a condom the next time you have sexual intercourse during the next 3 months (oral, vaginal or anal sex); and (2) use condom every time you have sexual intercourse during the next 3 months" (1=extremely unlikely to 5=extremely likely).

Condom use was measured as frequency of condom use, "Thinking about all sexual behavior (oral, vaginal or anal sex) in the past 3 months, how often have you used condoms?" (1=Never, 2=rarely, 3=sometimes, 4=very often, and 5=always).

Data Analysis

All analyses were conducted in SPSS version 22 (SPSS Inc., Chicago, IL). Paired samples t-tests were used to evaluate the pre-post effects of the intervention. Descriptive, correlational, and multivariate regression analyses were performed to examine predictors of condom intentions and use. Prior to conducting the regression analyses, analysis of standard residuals was carried out on the data to identify any outliers. The data contained no outliers (intentions: Std. Residual Min = -2.34, Std. Residual Max = 1.62; condom use: Std. Residual Min = -1.62, Std. Residual Max = 2.26). Tests to determine if the data met the assumption of collinearity indicated that multicollinearity was not a concern (VIF for all independent variables ranged from 1.01 to 1.19 for intentions and from 1.04 to 1.99 for condom use; tolerance for all variables ranged from 0.50 to 0.96 for intentions and from 0.50 to 0.96 for condom use). The data met the assumption of independent errors (intentions: Durbin-Watson value = 2.10; condom use: Durbin-Watson value = 1.86). The histograms of standardized residuals indicated that the data contained approximately normally distributed errors, as did the normal P-P plots of standardized residuals, which showed points that were at or close to the line. The scatterplots of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity.

Results

Sample Characteristics

Table 1 shows the sample characteristics. At baseline, the mean age was 19.62 (*SD* = 1.49). First year students represented 35.9% of participants, while 21% were 2nd years, 17.4% were 3rd years and 21.5% were 4th years. Most participants (80%) lived on campus. The majority of students reported sexual behavior (i.e., had one or more sex partners) in the prior three months (92.3% at baseline, 92.4% at follow-up). Participants had *M* = 1.36 (*SD* = 1.75) partners at baseline and *M* = 1.49 (*SD* = 1.74) partners at follow-up. Most participants had a main or steady partner (67% at baseline and follow-up). However, only 30% of

participants at baseline and 33% at follow-up reported always using condoms. And, less than half of the students (39.3% at baseline, 38.3% at follow-up) used other birth control methods.

In order to examine whether the follow-up sample differed from those who did not complete the study, we examined possible differences between follow-up survey completers and non-completers on age, ethnicity, education, residence, relationship status, partner type, current sexual behavior, condom use frequency, condom use at last sex, partner age, partner education, birth control, emergency contraception, and female condoms (Table 1). Age ($p < .01$) and education ($p < .01$) differed significantly among completers and non-completers, such that older participants and students in their later years of college were more likely to complete both surveys. Participants did not differ significantly on other characteristics.

Dispenser Awareness and Use

The majority of participants (89%, $n = 105$) saw the condom dispensers in person and 44% ($n = 52$) took a condom from the dispensers. The number of condoms students took each time they used the dispensers ranged from 1 to 12; on average, students took 4.35 ($SD = 2.74$) condoms each time. Of those who used the dispensers, ten percent ($n = 5$) said this was the first time they had ever obtained condoms. Participants mainly used dispensers in the dorm bathrooms to obtain condoms (81%, $n = 42$). A much smaller percentage (15%) used both the dorm bathrooms and campus health center. More than 70% ($n = 38$) of students who got condoms from the dispensers reported using them for sexual intercourse, while 81% ($n = 42$) gave away some condoms they got from the dispensers.

At baseline more than half of students ($n = 100$, 51.5%) said they had obtained condoms in the past 3 months; at follow-up, 70% ($n = 83$) had obtained condoms, a nearly 20% increase. McNemar's chi-quare test was used to assess whether the increase was

significant. Obtaining condoms did increase significantly over the three-month period ($p < .001$). At the time of the follow-up survey, 22% ($n = 26$) were carrying condoms they got from the dispensers. In contrast, only 15% of students were carrying condoms at baseline. McNemar's chi-quare test revealed this to be a significant increase ($p < .001$). We also added lubrication to the dispensers partway through the initiative. Nine students (17%) took lube packets from the dispensers. The number of packets taken each time ranged from 1 to 11.

Students were extremely comfortable using the dispensers ($M = 4.25$, $SD = .93$). They were much more comfortable using the dispensers when alone ($M = 4.50$, $SD = .87$) than when in the company of other students ($M = 3.81$, $SD = 1.19$). Students also expressed positive attitudes towards the dispensers ($M = 3.99$, $SD = .80$). They liked the condoms that were in the dispensers ($M = 3.83$, $SD = 1.45$), and the majority of students (82.7%) said they preferred the Trojan Magnum® condoms that was offered.

In terms of other places where students got condoms, at baseline most of those students had obtained condoms off campus (33% used pharmacies only and 12% used non-campus health clinics only); 17% of students had obtained condoms from the campus health center only. At follow-up, 26% of students reported obtaining condoms from the pharmacies, 13% from campus health center, and only 3% from non-campus health clinics.

Most students who used the dispensers ($n = 31$, 59.6%) said there were times when they went to take a condom from the dispenser but it was empty. The number of times the dispenser was empty ranged from 1 to 12, (mode = 1, median = 2).

Effects on Condom Access

H1 predicted that the intervention would lead to greater perceptions of availability, accessibility and acceptability at follow-up compared to baseline. Paired samples t-tests were performed to test these hypotheses (Table 2). Results revealed a statistically significant increase in perceptions of availability and accessibility. Students perceived

condoms to be somewhat available prior to the intervention (M = 3.54, SD = 1.74) and felt even more so after the intervention (M = 3.92, SD = 1.05), $t(117) = -3.27$, $p < .001$. They were also more likely to pass by a location with condoms ($p < .001$) and take free condoms ($p < .01$) after the intervention was implemented. Students perceived condoms to be accessible prior to the intervention (M = 3.98, SD = 1.14), and felt even more so after the intervention (M = 4.25, SD = 1.04), $t(117) = -2.23$, $p < .05$. Participants did not change their perceptions of condom acceptability, however (Pre: M = 3.79, SD = 1.04; Post: M = 3.79, SD = .98), $t(115) = .01$, $p = 1.00$.

Effects on Condom Norms, Intentions and Use

H2 predicted exposure to the intervention would increase condom norms, intentions and use at follow-up compared to baseline. Paired samples t-tests were performed to test these hypotheses (Table 2). Results revealed no significant differences in condom norms but a significant *decrease* in condom intentions and condom use. Condom norms slightly increased after implementation (M = 2.88, SD = .92) compared to before (M = 2.82, SD = .99), but the change was not statistically significant, $t(117) = -.72$, $p = .48$. Counter to our hypothesis, results also revealed a significant *decrease* in condom intentions and use. Students expressed favorable intentions to use condoms prior to implementation (M = 3.96, SD = 1.27), but they expressed lower intentions after implementation (M = 3.67, SD = 1.39), $t(117) = 2.31$, $p = .03$. Students also reported using condoms sometimes prior to the intervention (M = 3.24, SD = 1.57), and they reported significantly lower condom use after the intervention (M = 2.87, SD = 1.57), ($t(105) = 2.52$, $p = .01$).

Association between Condom Access and Condom Intentions and Use

H3 predicted that availability, accessibility, and acceptability, and dispenser use would be associated with condom intentions and use. Table 3 shows correlations among these variables. A multiple hierarchical linear regression analysis was performed to evaluate whether these variables were associated with condom intentions at follow-up (Table 4). In

step 1, baseline age, sexual behavior and partner type were entered. In step 2, follow-up availability, accessibility, acceptability, and dispenser use were entered. The regression analysis was statistically significant ($F(7, 94) = 2.90$, $p = .009$, $R^2 = .18$, $R^2_{Adjusted} = .12$). Sexual behavior was significant when first entered in the model (β = .22, $t(94) = 2.24$, $p = .03$). In the final model, however, only partner type was a significant predictor of condom intentions (β = .28) such that women with casual partners had higher intentions to use condoms than women with main partners. None of the other variables were significant.

A second multiple hierarchical linear regression analysis was performed to evaluate how well key variables were associated with *actual* condom use at follow-up (Table 5). In step 1, baseline age and partnership type were entered. In step 2, follow-up availability, accessibility, acceptability, and dispenser use were entered. The regression analysis was significant ($F(6, 87) = 3.42$, $p = .004$, $R^2 = .19$, $R^2_{Adjusted} = .14$). In the final model, partner type (β = .33, $t(94) = 3.25$, $p = .002$) and dispenser use (β = .22, $t(94) = 2.24$, $p = .028$) were significantly associated with condom use. Women with casual partners and persons who used the dispensers were more likely to use condoms.

A one-way analysis of variance was conducted to further examine the relationship between partner type stability (whether participants maintained the same partner type throughout the study) and condom use. The first step of the analysis examined change in partners from pre to post. Data was available at both pre and post for N = 100 participants. The data revealed four groups: those who 1) maintained a main partner; 2) maintained a casual partner; 3) changed from casual to main partner and 4) changed from main to casual partner. The majority of participants ($n = 59$, 59%) had a main partner at both time points and (n = 16, 16%) had casual partners at both time points. Fourteen percent of participants changed from casual to main partners; 11% changed from main to casual partners. As expected, ANOVA revealed a significant relationship between partner type stability and condom use ($F(3, 96) = 4.07$, $p = .009$). Participants who maintained casual partners had

higher condom use frequency at follow-up (*M* = 3.75, *SD* = 1.44), followed by those who changed from casual to main partners (*M* = 3.43, *SD* = 1.43). Participants who maintained their main partnerships had lower condom use frequency (*M* = 2.49, *SD* = 1.58). Finally, participants who changed from main to casual partners reported the lowest condom use frequency (M = 2.36, SD = 1.43).

Discussion

This study investigated the effects of an innovative condom distribution program on safer sex outcomes, based on a pre-post design with a 3-month follow-up period. Results supporting this intervention were mostly found over a brief period of time, though some caveats should be noted. Overall, the findings support the potential for condom distribution programs and safe sex messaging to increase condom availability and accessibility for sexually active college-aged Black women.

The majority of respondents reported seeing the condom dispensers on campus. While slightly less than half the sample took condoms from the dispensers, the percentage increased to more than 50% when examining only those who saw the dispensers. A larger proportion of respondents were also carrying condoms after the intervention than before, and many of those condoms came from the dispensers. Put another way, more than half of respondents who saw the dispensers obtained condoms from the dispensers, and half of those who obtained condoms were carrying them at the time of the follow-up survey.

Moreover, in a multiple regression analysis controlling for several factors, dispenser use was significantly associated with condom use, suggesting that it may have played a role in increased condom use for some women. Obtaining and carrying condoms are prerequisites of use and have been shown to predict condom use in prior studies, (Bryan et al., 2002; Carvalho et al., 2015). Consequently, some young women may be preparing themselves for potential sexual encounters and showing readiness to use condoms.

Perceptions of condom availability and accessibility increased significantly after the intervention. Participants were more likely to say that condoms were available after implementation of the dispensers, and were significantly more likely to pass by a location where condoms were freely available. Although accessibility was relatively high prior to the intervention, the presence of the dispensers further increased participants' access perceptions of where to get condoms on campus and the ease of getting condoms. These findings are consistent with past research showing condom distribution programs increase condom availability and accessibility for young people (Centers for Disease Control and Prevention, 2015a; Charania et al., 2011). However, this study adds to this body of literature by showing that these findings extend to a predominantly Black, religiously affiliated college campus serving African American females.

Contrary to expectations, condom acceptability did not change. Condom acceptability constitutes embarrassment, stigma, discomfort and awkwardness (or lack thereof) that young women may feel when attempting to access condoms. Evidence does indicate that embarrassment is one of the factors that can limit condom acquisition among young women (Bell, 2009; Brackett, 2004; Dahl, Gorn, & Weinberg, 1998; van Teijlingen et al., 2007). Prior to the intervention, young women in this study reported feeling moderate levels of condom acceptability. However, there was room for improvement and we expected the condom dispensers/messages to have a positive impact on condom acceptability. Some studies suggest that embarrassment may emerge as a result of the social context of condom acquisition (Brackett, 2004; Dahl, Manchanda, & Argo, 2001). That is, the settings where students obtain condoms can sometimes provoke anxiety, stigma and embarrassment. To counter those negative emotions, young people committed to obtaining condoms develop coping and acquisition strategies. Past research with college students in the United States indicate a range of coping strategies that young people employ when attempting to obtain condoms (Brackett, 2004; S. G. Moore et al., 2006). In one study,

Brackett (2004) asked college students to purchase condoms and then describe their experiences in a narrative. While both males and females employed coping strategies to purchase condoms, females were more likely to do so than males. Strategies included monitoring other customers, moving quickly through the store, and concealing the box (Brackett, 2004). It is possible that acceptability remained unchanged because young women in this study had already developed strategies—such as monitoring their environment and concealing the condom package—which they then used when obtaining condoms from the dispensers. Thus, they didn't perceive the program as affecting how they felt about obtaining condoms. This may be particularly the case for older students, who were more likely to remain in the study at follow-up. Understanding how condom acceptability relates to condom use, and who is more susceptible to embarrassment about obtaining condoms is still important; as such findings have implications for sexual health research with young women.

Contrary to expectations, condom use intentions and condom use decreased between pre-test and post-test. The decrease in condom use was observed among individuals in main/steady relationships as well as those in more casual relationships. The decrease in condom use appears to be driven by the large number of students who maintained main partnerships throughout the study and who were less likely to use condoms. Drawing on past research, there are at least two possible explanations for these unanticipated findings. First, while unexpected, these findings are consistent with past research showing that condom use changes over the course of a person's time in college (Walsh, Fielder, Carey, & Carey, 2012). In fact, in one study, young women decreased condom use during their first year of college (Walsh et al., 2012). Among young persons, reasons for not using condoms have included perceptions of partner safety and the belief that sufficient measures were being taken to avoid pregnancy (Civic, 2000; Wingood & DiClemente, 1998). Indeed, it is a well-established finding that as young adults age, they

use condoms less over time (Zimmerman et al., 2007). In many cases, they make the "contraceptive switch" from condoms to hormonal birth control as a relationship progresses, especially in the context of main/steady relationships (Noar, Zimmerman, & Atwood, 2004). Future research should continue to explore motivations for non-condom use in the context of intimate and casual relationships, including the role of condom access.

Second, our findings underscore the persistence of the intention-behavior gap (Sheeran, 2002; Sheeran & Orbell, 1998) and the difficulty in closing this gap among young Black women. In this study, participants held generally positive intentions to use condoms. However, actual condom use prior to and after the intervention was low (and the correlation between intentions to use condoms at baseline and condom use at follow-up was moderate, $r = .35$, $p < .001$). This study attempted to reduce this gap by implementing the condom dispensers, and by hypothesizing that students would not only use the dispensers but would then go on to actually use the condoms. It is conceivable that as students increasingly obtain and carry condoms, they will have condoms available when a sexual encounter occurs and may negotiate condom use and use the condoms. It also could be that once an individual has taken condoms from the dispensers, they may not know how to introduce or re-introduce condoms into their relationships. Future research should continue to examine the link between intentions and behavior, and potential mediators of this link such as obtaining and carrying condoms and other preparatory behaviors (Bryan et al., 2002). Future condom distribution interventions may need to include additional components encouraging young people to not only obtain and carry condoms but also to negotiate condom use with their partners. Perhaps theory-based holistic interventions that address environmental and skills factors are especially useful for college-aged Black women who not only need access to sexual health resources in their environment but also need to learn what to do once those resources are widely available and accessible.

Conclusion

In conclusion, this study adds to the literature on the effectiveness of condom distribution programs. The intervention increased perceptions of the availability and accessibility of condoms, and motivated students to obtain and carry condoms. Dispenser use was also associated with condom use. Extant research points to lack of easy access to condoms on HBCUs in the United States. Thus, this study demonstrates that a structural-level approach to increasing condom access to African American young adults at risk for HIV and other STIs can be successful in achieving the goal of increased access.

Table 1: Baseline Participant Demographic and Behavioral Characteristics

Variable	Pre (N = 195)		Post (N = 118)		
	N	%	N	%	*p*
Gender					
Female	195	100	118	100	
Age					.01
18	54	28.4	23	19.5	
19	47	24.7	33	28.0	
20	34	17.9	24	20.3	
21	37	19.5	30	25.4	
22	11	5.8	4	3.4	
23	5	2.6	3	2.5	
25	2	1.1	1	0.8	
Race					
Black or African-American	195	100	118	100	
Ethnicity					.50
Hispanic/Latino(a)	9	4.7	5	4.3	
Non-Hispanic/Latino	183	95.3	112	95.7	
Education					.01
Undergraduate – 1st year	70	35.9	31	26.3	
Undergraduate – 2nd year	41	21	29	24.6	
Undergraduate – 3rd year	34	17.4	25	21.2	
Undergraduate – 4th year	42	21.5	29	24.6	
Undergraduate - 5th year or beyond	8	4.1	4	3.4	
Residence					
On-campus residence hall	156	80	92	78	.55
Off-campus – alone	34	17.4	22	18.6	
Off-campus – with parents	5	2.6	4	3.4	
Relationship status					.43
Main or steady partner	129	66.2	79	66.9	
Casual partner	63	33.8	37	33.1	
Partner type					.37
Males only	179	92.3	108	91.5	
Females only	3	1.5	3	2.5	
Both males and females	12	6.2	7	5.9	
Current sexual activity (past 3 mos.)					.36
Yes	179	92.3	109	92.4	
No	15	7.7	9	7.6	
Condom use frequency (past 3 mos.)					.60
Never	45	23.1	26	22.6	
Rarely	28	14.4	14	12.2	
Sometimes	35	17.9	20	17.5	
Very often	25	12.8	17	14.8	
Always	58	29.7	38	33	
Condom use at last sex					.12
Yes	107	55.7	54	46.2	
No	85	44.3	63	53.8	

Partner age					.55
Younger than you	3	1.6	3	2.5	
About the same age	106	54.9	63	53.4	
Older than you	70	36.3	43	36.4	
Much older than you	14	7.3	9	7.6	
Partner education					.49
Student at same school	5	2.6	4	3.4	
Student at different school	99	51	57	48.3	
Not a college student	90	46.4	57	48.3	
Birth control					.42
Yes	75	39.3	44	38.3	
No	116	60.7	71	61.7	
Emergency contraception					.22
Yes	39	20.5	21	18.3	
No	151	79.5	94	81.7	
Female condoms					.58
Yes	15	8	9	7.9	
No	173	92	105	92.1	

Table 2: Pre- and Post Intervention Evaluation Results

		Pre Intervention X_1	Post Intervention X_2	Change $(X_1 – X_2)$	*p*
General availability (*n* =118)	*M*	3.54	3.92	-.43	.001
	SD	1.74	1.05		
Location availability (*n* = 118)	*M*	3.08	4.01	-.92	.001
	SD	1.84	1.78		
Accessibility (*n* =118)	*M*	3.98	4.25	-.26	.03
	SD	1.14	1.04		
Acceptability (*n* =116)	*M*	3.79	3.79	.00	1.00
	SD	1.04	.98		
Condom norms (*n* =118)	*M*	2.82	2.88	-.07	.48
	SD	.99	.92		
Acquisition intentions (*n* = 118)	*M*	3.68	3.62	.06	.66
	SD	1.29	1.27		
Carry intentions (*n* = 118)	*M*	3.80	3.62	.18	.15
	SD	1.18	1.26		
Condom intentions (*n* =118)	*M*	3.96	3.67	.30	.03
	SD	1.27	1.39		
Condom use (*n* =105)	*M*	3.24	2.87	.37	.01
	SD	1.57	1.57		

Table 3: Correlations for Variables in the Study

		1	2	3	4	5	6	7	8	9
1	Age	-	.05	.13	.08	.09	.12	.08	-.06	.04
2	Availability	-.07	-	.68**	.12	.15	.09	.13	.03	.01
3	Accessibility	-.08	.63**	-	.19*	.08	.10	.09	-.04	-.16
4	Acceptability	-.07	.15	.14	-	.03	.01	.07	-.09	.02
5	Dispenser use	.04	-.01	-.03	.16	-	-	-	-	-
6	Acquisition intentions	.01	.18	.18*	.10	.05	-	.86**	.63**	.42**
7	Carry intentions	.07	.14	.15	.15	.28**	.73**	-	.62**	39**
8	Condom use intentions	.08	.23*	.18*	.02	.04	.60**	.57**	-	.51**
9	Condom use	-.05	.16	.10	-.03	.19	.45**	.48**	.61**	-

*Note. *p<.05, ** p<.01;* baseline correlations are in upper diagonal; follow-up correlations in lower diagonal; dispenser use was only assesse at follow-up.

Table 4: Relationship Between Condom Access and Condom Intentions

Predictor Variables	β (*SE*)	*r*	R^2	$_{Adjusted}$ R^2	*p*
Step 1		.32	.10	.07	.016
Age	-.04 (.09)				
Sexual behavior	.22 (.48)*				
Partnership type	.26 (.24)*				
Step 2		.42	.18	.12	.009
Age	-.03 (.09)				
Sexual behavior	.18 (.48)				
Partnership type	.28 (.24)**				
Availability	.10 (.14)				
Accessibility	.18 (.14)				
Acceptability	.05 (.12)				
Dispenser Use	.10 (.22)				

*Note. *p<.05, ** p<.01; age and sexual behavior were measured at baseline and all other variables were measured at follow- up; age was coded continuously; sexual behavior in the past 3 months was coded 0 = no, 1 = yes; partner type was coded 0 = main partner, 1 = casual partner; availability, accessibility, acceptability and norms were coded on 1-5 scales; dispenser use was coded 0 = no; 1 = yes.*

Table 5: Relationship Between Condom Access and Condom Use

Predictor Variables	*β (SE)*	*R*	R^2	$_{Adjusted}\ R^2$	*p*
Step 1		.33	.11	.09	.005
Age	-.08 (.13)				
Partner type	.34 (.33)**				
Step 2		.44	.19	.14	.004
Age	-.09 (.12)				
Partner type	.33 (.33)**				
Availability	.12 (.19)				
Accessibility	.08 (.18)				
Acceptability	-.08 (.15)				
Dispenser use	.22 (.30)*				

*Note. *p<.05, ** p<.01; age and partner type were measured at baseline and all other variables were measured at follow-up; age was coded continuously; partner type was coded 0 = main partner, 1 = casual partner; availability, accessibility, acceptability and norms were coded on 1-5 scales; dispenser use was coded 0 = no, 1 = yes.*

CHAPTER 3

Exposure and impact of condom dispensers and point-of-access safer sex messaging targeting Black college women

Introduction

Psychosocial and normative barriers to accessing condoms may impede condom acquisition and use. The current normative environment in the United States, for example, suggests that young women should not be seen acquiring condoms and should not be carrying condoms on their person (Reeves, Ickes, & Mark, 2016). According to prior studies, both young women and young men often hold the belief that young women should not be accessing and carrying condoms (Bell, 2009; Warren-Jeanpiere, Sutton, et al., 2011). Some young women also hold the belief that because they are not the ones who "use condoms" then they should not be responsible for getting them.

The theory of gender and power (Wingood & DiClemente, 2000) posits that these negative societal beliefs put young women at increased risk for HIV and other sexually transmitted infections. By creating taboos with regard to how young women should express their sexuality, society prevents young women from taking proactive steps—such as engaging in condom preparatory behaviors—to reduce their risk of contracting STIs. Specifically, the structure of social norms and affective attachments theorizes that young women who are more accepting of conventional social norms and beliefs will be more likely to experience adverse sexual health outcomes (Wingood & DiClemente, 2000). For example, adolescent females who perceive there to be a double standard between how young men and women should behave were less likely to practice safer sex (S. Moore & Rosenthal, 1992).

Past research further indicates that some young people feel shameful and embarrassed about obtaining condoms (Bell, 2009; Dahl et al., 2001; S. G. Moore et al., 2006; Warren-Jeanpiere, Sutton, et al., 2011). Young women, in particular, are more likely to feel embarrassment than young men (Francis et al., 2016; Reeves et al., 2016). This is because condom acquisition carries with it a possible embarrassing acknowledgment that the person will have or intends to have sex. Young women may be stigmatized more than men if they are seen obtaining carrying condoms because of the perception that they "want sex" or are promiscuous. (Bell, 2009; Warren-Jeanpiere, Sutton, et al., 2011).

Embarrassment is a reaction to, or the anticipation of, a negative evaluation of oneself by a real or imagined audience, leading to an ‘‘aversive and awkward emotional state following events that increase threat of unwanted evaluation from a real or imaged social audience" (Dahl et al., 2001). Embarrassment and stigma about obtaining condoms is separate and independent from embarrassment about putting on, using, or disposing of condoms (S. G. Moore et al., 2008). S. G. Moore et al. (2008) found embarrassment about obtaining condoms exceeded embarrassment about condom use. They also found condom acquisition embarrassment was negatively associated with condom carrying and frequency of condom use. People who were embarrassed obtained, carried and used fewer condoms than those who were not (S. G. Moore et al., 2008). This finding complemented a study from a decade earlier, which found that embarrassed individuals purchased condoms less often, less recently, and purchased fewer condoms (Dahl et al., 1998).

Despite the relationship between condom acceptability and condom acquisition, few condom distribution interventions have directly addressed these beliefs and behaviors. Condom distribution interventions have been effective at increasing availability and accessibility of condoms. However, that may not be enough. Francis et al. (2016) found that even when condoms were made available and accessible via dispensers in college bathrooms, many young women still did not feel comfortable obtaining condoms. Addressing

condom acceptability, therefore, may be critical to reducing young women's embarrassment about obtaining condoms and ultimately increase condom use (Francis et al., 2016). Accordingly, health messages are needed to increase young women's comfort with obtaining and carrying condoms and ultimately using those condoms.

HIV/STI Prevention Campaigns in the United States

Health communication campaigns have become an integral HIV/STI prevention strategy in the United States (LaCroix, Snyder, Huedo-Medina, & Johnson, 2014; Noar et al., 2009). In 2009, for example, the Centers for Disease Control and Prevention launched *Act Against AIDS*, a multi-year initiative aimed at raising HIV awareness among all Americans and reducing risk of infection among those most at risk for the disease (Centers for Disease Control and Prevention, 2013a). Public health and communication researchers have also designed several safer sex mass communication campaigns, with some targeted at Black adolescents and young adults. Romer et al. (2009), for instance, developed and disseminated culturally appropriate safer sex messages in mass media for Black youth.

Health campaigns in combination with other strategies have been effective in changing risky sexual behaviors. A recent systematic review of combination health campaigns and health product distribution showed that such interventions had a significant impact on the targeted behaviors (Robinson et al., 2014). Overall, evidence suggests an 8.4 percentage point increase in favorable behavior change when interventions include health campaigns *and* health product distribution. That same systematic review found that condom use increased by 4 percentage points in studies where condoms were distributed alongside health communication initiatives. Another systematic review of 21 structural-level condom distribution programs showed that such interventions had a significant impact on condom acquisition, carrying, condom use, and reduced incidents of STIs (Charania et al., 2011). Of the seven U.S. studies, however, only two included health campaign components and only one assessed condom carrying. Thus, it is unclear whether this approach would be

efficacious in increasing condom use among young Black women.

Point-of-access communication refers to efforts to influence psychosocial and behavioral outcomes at the time the behavior is being performed. Point-of-access communications are an effective strategy frequently used in consumer advertising and marketing (Nielsen, 2010, 2016), and they are increasingly being adapted for public health communication (Grech & Allman-Farinelli, 2015; Robertson, McGee, Marsh, & Hoek, 2015). These strategies have been tested across a range of public health contexts, including communicating drug safety (Perlman, Lebow, Raphael, Ali, & Simmons, 2013), tobacco health risks (Li et al., 2012), and healthy food choices (Budd et al., 2015). Existing evidence supports a positive association between exposure to point-of-access messaging and health outcomes (Grech & Allman-Farinelli, 2015; Robertson et al., 2015).

This paper reports on the exposure to and impact of a three-month intervention to increase condom access among young Black women attending an all-female HBCU in the Southeastern United States. The intervention included simultaneous distribution of free condoms (via dispensers with free condoms) and point-of-access messaging to address stigma and embarrassment as well as condom acquisition and carrying. The integrative model of behavioral prediction and theory of gender and power guided intervention development. Effective health messaging to reduce embarrassment and stigma can play an important role in influencing condom acquisition. Exposure to messages at the point of taking condoms from the dispensers could potentially reduce embarrassment, stigma and discomfort associated with obtaining condoms. This in turn would increase the likelihood of having a condom when needed and eventually lead to condom use. The following hypotheses were developed: H1: Exposure to messages will be positively associated with condom norms and acceptability. H2: Message reactions will be associated with lower embarrassment/stigma, greater comfort with the dispensers, and increased use of the dispensers.

Methods

We used a systematic approach to design, test, and evaluate the messages. We began the process by identifying our target audience of Black college women, and the specific site for the intervention—a Historically Black College in North Carolina. In a prior study, we found females to report greater embarrassment than males in procuring condoms after implementation of condom dispensers on a college campus (Francis et al., 2016). Thus, it was important to develop messages targeted at females to increase comfort with taking and carrying condoms.

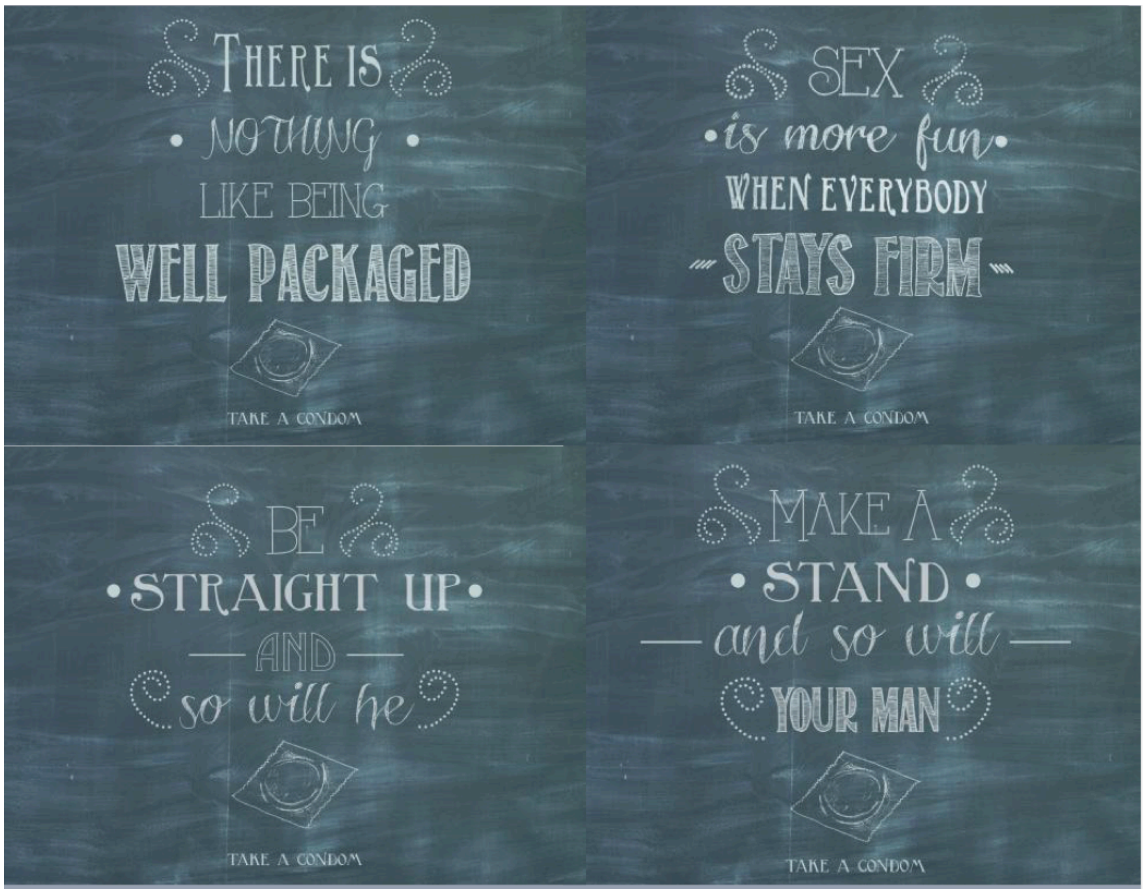
To develop and test the messages, we conducted six focus group discussions (n=40) in two phases at an alternate HBCU in North Carolina. We made this decision to avoid exposing students at the intervention college to the intervention. Female members of the research team conducted the focus groups. All focus group participants signed informed consent and received $15 gift cards. The first phase explored perceptions about condom access within the college environment and potential messaging ideas. In an iterative analysis process, we identified salient beliefs about condom access, norms and acceptability. We worked with a creative advertising team at the University of North Carolina at Chapel Hill School of Media and Journalism to draft two message concepts. The first concept used emojis (popular cartoon-like characters and symbols) and a females' hand holding a condom. The second concept presented scripted messages (e.g. "There is nothing like being well packaged.") on a chalkboard background.

We conducted two additional focus group discussions to document reactions to the messages. Participants answered open-ended questions about attention, comprehension, credibility, cognitive and emotional reactions, personal relevance, perceived effectiveness, and overall appeal to HBCU students. In general, students preferred the concept with the script on the chalkboard, perceiving it as a message that would catch their attention and encourage them to take condoms, and as something they would remember and share with

their friends. Students further said they would feel comfortable obtaining condoms from the dispensers if the scripted messages were displayed. Students suggested ways of enhancing the messages, changing the colors of the posters to be more appealing, and simplifying the call to action. We revised initial messages according to the focus group feedback. Finally, we elicited feedback from key target audience informants at the intervention college. The final messages used humor as a tool to attraction attention and persuasion (Markiewicz, 1974).

To evaluate the intervention, we used a one group, pre-post panel design. The intervention ran from November 1, 2015 through January 31, 2016 and participants were surveyed at baseline and three months after the intervention began. We inserted four posters with safer sex messaging in 10 condom dispensers around campus. Nine dispensers were located in four dormitories and one dispenser was located in the campus health building. The messages were not rotated during the intervention. During the follow-up survey, participants first answered questions about the availability, accessibility and acceptability of condoms on campus. Participants saw the messages in random order and then answered questions about the messages.

Figure 3: Posters Used in Intervention



Measures

The questionnaire included items to assess demographic and sexual behavior variables.

Unaided Recall was measured by asking participants to type in a box if they remembered any of the messages.

Recognition/exposure to the messages was measured by assessing frequency of having seen the messages. Participants were shown each of the four messages in random order and then asked how many times they had seen the messages before. “In the past 3 months, how many times would you say you saw this message on a dispenser?” Response options ranged from 0 times to 81 or more times. An aggregate variable was created to

quantify the total number of messages each participant saw such that participants received a 1 for each message they recognized and 0 if they did not recognize the message. Participants could have recognized all four of the messages or one, two or three of the messages. An overall measure of degree of exposure to the messages was also created such that those who did not recognize any of the messages were categorized as having had *no exposure* to the messages. Those who had 1-10 exposures were grouped as *low to mid exposure*, and those with 11 or more exposures were grouped as *high exposure.* The overall exposure variable was used in multivariate analysis.

Message impact was measured with seven items (Cronbachs' alpha = .94): "Think about the 4 messages you just saw. To what extent do the messages make you feel…comfortable taking condoms from a dispenser, less stigmatized taking condoms from a dispenser, less embarrassed taking condoms from a dispenser, proud taking condoms from a dispenser?" Participants were also asked, "To what extent do the messages make you feel…at easy carrying condoms, more empowered carrying condoms, confident carrying condoms?" (1=Not at all, 2=a little, 3=some, 4=a lot, and 5=very much).

Perceived message effectiveness was measured with a single item: "Think about the 4 messages you just saw and answer the following items. The messages make me more likely to take a condom from a dispenser" (1=none to 5=all).

We also measured participants' perceptions of the *message attributes* using four items (Cronbach's alpha = .82): "Think about the 4 messages you just saw and answer the following items. The messages are memorable to me. The messages are catchy to me. The messages are amusing to me. The messages are relevant to me" (1=Not at all, 2=a little, 3=some, 4=a lot, and 5=very much).

Acceptability was measured with six items (Cronbach's alpha =.93) adapted from the MCAS scale (Helweg-Larsen & Collins, 1994): (1) "It is very embarrassing to obtain condoms"; (2) "When I need condoms I often dread having to get them; (3) I think that

obtaining condoms is awkward"; (4) "It would be embarrassing to be seen buying condoms in a store"; (5) "It would be embarrassing to be seen picking up free condoms"; (6) "I always feel uncomfortable when I have to get condoms" (1=strongly disagree to 5=strongly agree).

Condom norms were measured with four items (Cronbach's alpha = .82): "How many of your female friends do you think…(1) talk about condoms with their sexual partners; (2) use condom during sexual intercourse; (3) carry condoms with them (4) get their own condoms" (1=none to 5=all).

Comfort using the dispensers was measured with three items: "In general, how comfortable do you feel using the dispensers? How comfortable do you feel using the dispensers when you are alone? How comfortable do you feel using the dispensers when someone is watching?" (1=extremely uncomfortable to 5=extremely comfortable). Items were evaluated separately.

Dispenser use was measured with one item: "In the past 3 months, did you ever use the condom dispensers?" (1 = Yes, 0 = No).

Carrying condoms.

Carrying condoms was measured with a single item: "Are you carrying condoms on you right now (i.e. in your pocket, wallet, or purse) that you took from one of the dispensers?" (1 = Yes, 0 = No).

Condom use at last vaginal sex was measured with a single item: "Did you (or your partner) use a condom the last time you had vaginal sex? (1 = Yes, 0 = No)

Results

Only 7% (*n* =8) of the 116 participants who reported exposure recalled the messages unprompted. When prompted, 77.6% of (*n* = 90) recognized at least one of the four messages (Table 6). Recognition of the individual messages varied only slightly. More than 60% of participants recognized messages that said, "Make a stand and so will your man" or

“Be straight up and so will he”; 56% recognized the other two messages: “Sex is more fun when everybody stays firm” and “There is nothing like being well packaged.”

As described above, three categories of respondents were identified: those with no exposure to the messages (38.8%, *n* = 45), those with low to mid levels of exposure (36.2%, *n* = 42), and those with high level of exposure (26.7%, *n* = 31). No significant differences were found between the three groups in terms of age or year in school. As expected, those who lived on campus had greater exposure to the messages; 88% of those who lived on campus were aware of 1 or more messages (*n* = 80) compared to 38.8% of those who lived off campus (*n* = 10), X^2 (1, 115) = 29.50, $p < .001$.

We also asked participants how the messages made them feel about taking and carrying condoms from the dispensers (Table 7). Most students said the messages made them feel somewhat comfortable taking condoms from the dispensers (*M* = 3.47, *SD* = 1.18). To a lesser extent, they reported that the messages made them feel proud (*M* = 3.29, *SD* = 1.27), less stigmatized (*M* = 3.12, *SD* = 1.22) and less embarrassed (*M* = 3.10, *SD* = 1.31) taking condoms. Participants also said the messages made them feel somewhat empowered (*M* = 3.34, *SD* = 1.29) confident (*M* = 3.34, *SD* = 1.20), and at ease (*M* = 3.30, *SD* = 1.20) carrying condoms. Participants perceived the messages as being effective in that they reportedly would motivate them to take a condom from the dispensers (*M* = 3.35, *SD* = 1.02). Together, this message impact scale had a mean of 3.28 (*SD* = 1.06).

Regarding message attributes, participants thought the messages were catchy (*M* = 3.54, *SD* = .92) and amusing (*M* = 3.48, *SD* = .90). Participants also perceived that the messages were relevant (*M* = 3.38, *SD* = 1.07) and memorable (*M* = 3.22, *SD* = .99). Together, this message attribute scale had a mean of 3.42 (*SD* = .78).

Exposure and Psychosocial Outcomes

H1 predicted that exposure to the messages would be associated with comfort with the dispensers, condom acceptability, and condom norms. A multivariate analysis of

variance (MANOVA) was calculated to assess the relationship between exposure and the three dependent variables. The analysis of comfort with the dispensers was not significant, $F(2, 48) = 1.96$, $p = .15$. The analysis of condom acceptability scores was statistically significant, $F(2, 48) = 3.39$, $p = .037$. Participants in the high exposure group ($M = 3.93$, $SD = 278$) and low/mid exposure group ($M = 3.99$, $SD = 1.01$) reported greater acceptability than those in the no exposure group ($M = 3.48$, $SD = 1.02$). The analysis of participants' condom norms scores was not significant, $F(2, 48) = .1.81$, $p = .32$.

Exposure and Targeted Behaviors

The cross-tabulations between exposure to the messages and targeted behaviors (dispenser use, carrying condoms, and condom use) are shown in Table 8. Individuals in the high exposure group (38.5%) were more likely than individuals in the low (32.7%) or no exposure group (28.8%) to take condoms from the dispensers, but this difference was not statistically significant. This, of course, may be an artifact of simply seeing the messages when a participant used a dispenser. Individuals in the high exposure group (46.2%) were also more likely than those in the low/mid (26.7%) or no exposure (26.9%) to carry condoms they took from the dispensers, but this was not statistically significant. Condom use at last sexual intercourse varied significantly across categories of message exposure; individuals using condoms in the last 3 months were more likely to have had higher exposure (37%) to the messages compared to those with low/mid exposure (33.3%) or no exposure (29.6%).

Finally, binary logistic regressions were computed to assess the relationship between message exposure, dispenser use, carrying condoms, and condom use (Table 9). The analysis revealed that individuals in the high exposure group were two times more likely to have used the dispensers compared to individuals in the no exposure group, although this was not statistically significant (OR: 2.22, $p = .14$, 95% CI [.76, 6.45]). Individuals in the high exposure group were three times more likely to carry condoms compared to individuals in the no exposure group, but this was also not statistically significant (OR: 3.90, $p = .15$, 95%

CI [.67, 14.26]). Finally, individuals in the high exposure group were also three times more likely to have used condoms compared individuals in the no exposure group (OR: 3.81, p = .01, 95% CI [1.34, 10.88]).

Message Impact, Psychosocial Outcomes and Behavior

H2 predicted that perceptions of message impact would be associated with greater comfort with the dispensers, condom acceptability, condom norms, and increased use of the dispensers. A series of multiple linear regression analyses were conducted to assess the relationship between the message impact and comfort with the dispensers, condom acceptability, and condom norms. The analyses revealed a significant positive relationship between message impact and comfort with the dispensers (β = .45, $t(50) = 3.52$, $p < .001$), ($F(3, 47) = 5.99$, $p < .01$, $R^2 = .28$, $R^2_{Adjusted} = .23$). Individuals with more positive perceptions about the messages' impact were more comfortable with the dispensers. There was no relationship between messages impact and condom acceptability (β = .17, $t(113) = 1.84$, p = .07), ($F(3, 110) = 1.79$, $p = .15$, $R^2 = .05$, $R^2_{Adjusted} = .02$). There was a significant relationship positive between message impact and condom norms (β = .21, $t(114) = 2.34$, $p < .05$), ($F(3, 111) = 3.00$, $p < .05$, $R^2 = .08$, $R^2_{Adjusted} = .05$). Individuals with more positive perceptions about the messages' impact had greater perceptions of condom norms.

A logistic regression analysis was conducted to assess the relationship between message impact and dispenser use. The analysis revealed a positive significant relationship between message impact and dispenser use (OR = 1.62, $p < .05$, 95% CI [1.10, 2.40]). Individuals with more positive perceptions about the messages' impact were 62% more likely to use the dispensers.

Discussion and Conclusion

The primary research question addressed in this paper concerned exposure to the condom dispenser messages among college-aged Black female students at a predominantly Black college in the Southeastern United States. The secondary research

questions examined the impact of the messages. In regard to the primary research question, almost 90% of participants reported exposure to the condom dispensers and almost 80% recognized at least one of the dispenser messages. The degree of exposure ranged from a low of 7% for individuals who recalled the messages unaided to the more than 75% who recognized at least one of the messages. The literature on HIV prevention mass media campaigns indicates that campaign exposure typically ranges between 52% and 77% (Noar et al., 2009). Literature on condom distribution programs also indicates that they achieve high awareness over a short period of time (Francis et al., 2016). Thus, by both benchmarks, this intervention had fairly high reach over a relatively short period of time.

The measures of exposure captured the frequency of exposure as well as a range of aspects relating to engagement with the dispensers. The majority of participants saw multiple messages. There was some indication that greater exposure to the dispenser messages was associated with improved safer sex behaviors. Individuals in the high exposure group were more likely to use the dispensers, and carry and use condoms. The findings suggest that exposure to the messages was associated with safer sex behaviors. It is of course possible that those who were more concerned with their sexual health, and thus more likely to obtain, carry and use condoms, were more attuned to the changes on campus and more aware of the messages.

The findings regarding the perceptions of message impact suggest that the communication element was well received overall: participants had generally positive reactions to the messages displayed on the dispensers. They rated the messages positively in terms of the messages' ability to make them feel comfortable and at ease when taking condoms, and empowered and confident carrying condoms. Positive reactions to the messages were associated with increased comfort with the dispensers, higher perceptions of condom norms and greater use of the dispensers. Perceptions of message impact were not associated with acceptability, however. This may be because participants did not feel

embarrassed as to be seen taking condoms, or perhaps the messages failed to reduce embarrassment. In fact, perceptions of the messages' impact on embarrassment were rated lower than other impact measures. Given that the messages included language such as "Make a stand and so will your man," it is possible that participants perceived the messages as strong and powerful, but not ones that would necessarily reduce embarrassment. Regarding message attributes, the messages were deemed catchy, amusing and relevant. This is encouraging, as humor-based health messages have at times not produced the intended persuasive effects on behavior change (Lapinski, Maloney, Braz, & Shulman, 2013).

As a measure of overall perceived effectiveness of the messages, participants believed the messages would motivate them to take a condom from the dispensers. Perceived message effectiveness has been shown to be a strong predictor of actual message effectiveness – i.e., attitude change (Dillard, Weber, & Vail, 2007). There are debates as to whether a perceived message effective can be captured using a single item and currently there is no agreed upon scale to measure perceived effectiveness (Yzer, LoRusso, & Nagler, 2015). Nevertheless, the findings for perceived effectiveness, message impact, and message attribute give us confidence that the messages may in fact nudge participants towards using the dispensers and perhaps using condoms as well.

There was a greater than 10% gap between participants who said they saw the dispensers but did not recognize any of the messages. Communication persuasion models (McGuire, 1984; Petty & Cacioppo, 1986) state that persuasion is more likely to occur when audiences pay close attention to a message. Without attending to the message, it is almost impossible for individuals to process the information being communicated, as such processing if necessary for changes in perceptions and behavior. The elaboration likelihood model (Petty & Cacioppo, 1986) does suggests that persuasion may still be possible when individuals pay limited attention to messages. Changes via this peripheral processing of

messages, however, are not expected to be as stable as when accomplished via central processing. Future research could be conducted to understand message characteristics that increase attention to and processing of the messages developed for this study.

While this study has several strengths, one limitation is that the messages remained static throughout the intervention. Research from other areas suggests that rotating messages may help improve message attention and memory (Noar et al., 2016). Future work could test this proposition by rotating the messages in the dispensers. This would increase the likelihood that participants will be exposed to each message during the intervention period. It should also be noted that exposure to the messages and dispenser use could be confounded. That is, it may be difficult to disentangle use of the dispenser from effects of the messages. A larger randomized controlled trial could make a contribution to the existing evidence base for combination HIV/STI prevention in that such a design could illuminate the effects of one type of messages relative to others or to a no message control.

In conclusion, this paper highlights a series of associations between exposure to safer sex messages and sexual health outcomes. The findings presented here are consistent with other literature, which shows that there are differences between categories of exposure relative to some safer sex behaviors. Overall, the findings suggest some potential impact of the messages on proximal behaviors such as condom acquisition, carrying, and use.

Table 6: Exposure to the Dispensers and Messages

		N	%
Dispenser			
Saw dispensers in person	Yes	106	89.1
	No	13	1.09
Used dispensers	Yes	52	49.1
	No	54	50.9
Recognition of individual messages			
Make a stand and so will your man	Yes	73	61.9
	No	45	31.8
Sex is more fun when everybody stays firm	Yes	67	56.4
	No	51	43.6
There is nothing like being well packaged	Yes	66	55.9
	No	52	44.1
Be straight up and so will he	Yes	71	60.2
	No	47	39.8
Exposure (% yes, *n* = 116)			
Recognized 1 message		90	77.6
Recognized 2 messages		63	54.3
Recognized 3 messages		60	51.7
Recognized all 4 messages		49	42.2
Interpersonal communication			
Talked about the dispensers or messages	Yes	45	38.1
	No	73	61.9
Tweet, post or share	Yes	25	21.2
	No	93	78.8

Table 7: Perceptions of the Messages

	M	SD
Message impact		
Comfortable taking condoms	3.47	1.18
Less stigmatized taking condoms	3.12	1.22
Less embarrassed taking condoms	3.10	1.31
Proud taking condoms	3.29	1.27
At ease carrying condoms	3.30	1.20
More empowered carrying condoms	3.34	1.29
Confident carrying condoms	3.34	1.25
Total message impact scale	3.28	1.06
Perceived message effectiveness		
Make me take a condom from dispenser	3.35	1.02
Message attributes		
Memorable	3.22	.99
Catchy	3.54	.92
Amusing	3.48	.90
Relevant	3.38	1.07
Total message attributes scale	3.42	.78

Table 8: Sexual Health Variables by Categories of Exposure

	No exposure N (row %)	Low to mid exposure N (row %)	High exposure N (row %)	χ^2	*p*
Dispenser use				3.97	.14
Yes	15 (28.8)	17 (32.7)	20 (38.5)		
No	19 (35.8)	23 (43.4)	11 (20.8)		
Carrying condoms					
Yes	7 (26.9)	7 (26.7)	12 (46.2)	1.40	.50
No	8 (30.8)	10 (38.5)	8 (30.8)		
Condom use at last vaginal sex				6.32	.04
Yes	16 (29.6)	18 (33.3)	20 (37)		
No	29 (46)	23 (36.5)	11 (17.5)		

Table 9: Logistic Regression for Sexual Health Variables by Categories of Exposure

	Dispenser use OR (95% CI)	Carrying condoms OR (95% CI)	Condom use at last vaginal sex OR (95% CI)
Age	1.14 (.83, 1.58)	1.46 (.89, 2.39)	1.16 (.86, 1.56)
Residence			
Off campus	ref	ref	ref
On campus	1.35 (.42, 4.31)	.24 (.04, 1.58)	.91 (.33, 2.58)
Exposure			
None	ref	ref	ref
Low/medium	.88 (.33, 2.32)	.85 (.18, 3.88)	1.54 (.61, 3.86)**
High	2.22 (.76, 6.45)	3.90 (.67, 14.26)	3.81 (1.34, 10.88)

Note. OR = adjusted odds ratio; CI = confidence interval; ref = reference group.
*p<.05, **p<.001

CHAPTER 4

Examining the role of interpersonal communication within the context of the condom distribution program and point-of-access messaging

Introduction

Traditionally, campaign effects have focused on individual's direct exposure to messages (e.g. seeing, reading, watching, listening). Numerous studies have subsequently demonstrated that health campaigns can affect people's psychosocial and behavioral outcomes through indirect social routes (Southwell & Yzer, 2007, 2009). This social diffusion model of campaign effects suggests that campaigns can affect people's behaviors indirectly by generating interpersonal communication within social networks. Southwell and Yzer (2007) provided three possible roles of interpersonal communication following communication campaigns. First, conversation can be an outcome, such as when exposure to messages directly leads to conversations with relevant others. Second, interpersonal conversation can act as a mediator between campaign exposure and behavioral outcomes. That could be the case when conversations influence perceived norms about a behavior, which in turn influences intentions and behavior. Third, interpersonal communication may also act as a moderator of campaign effects such as when conversations increase personal relevance of an issue for some people but not for others. This study examines the first two potential roles of interpersonal communication suggested by Southwell and Yzer (2007).

This paper focuses on the conversations generated as a result of a condom distribution program and point-of-access messaging aimed at motivating college-aged Black women acquire, carry, and ultimately use condoms. Condom acquisition and carrying is a non-normative behavior among young women, which can result in stigmatization and

embarrassment (Francis et al., 2016). Given the goals of this intervention, particular attention was paid to social norms. The present paper also incorporates the valence of such conversations (positive or negative). The project focused specifically on changing a behavior that is still considered taboo for young women and thus provides a unique opportunity to study how communication-related constructs produce potential psychosocial and behavioral effects. In research conducted after a condom dispenser program at a large university in the Southeastern U.S., Francis and colleagues (2016) found many students reported talking to at least one other person about the dispensers, and others learned about the dispensers from another person. After hearing about or seeing the dispensers, students most often talked to their friends or romantic partners. Thus, conversations are often an expected outcome of condom distribution programs in environments such as college campuses.

Interpersonal Communication

Communication researchers have long recognized the effects of public communication campaigns may depend, in part, on a campaign's ability to generate interpersonal communication (Hornik & Yanovitzky, 2003; Southwell & Yzer, 2007). Lazarsfeld and Katz (1955), following their investigation of voting behavior, proposed the two-step flow model to explain the how information flows from the mass media to the public. According to the model, mass media influence opinion leaders who then influence individuals in their social networks. The model is predicated on opinion leaders being exposed to mass mediated information and then sharing such information with others in their networks. Opinion leaders, it is believed, have greater access to media and information, and will therefore pass along to others the knowledge gained from exposure to mass mediated information. Thus, opinion leaders serve as intermediaries connecting the larger audience to mass mediated information. The two-step flow model also proposes that the lay public will gain information from conversations with opinion leaders, and such conversation could then influence health beliefs and behaviors. While the two-step flow

model has received many criticisms in the literature (Troldahl, 1966), the core assumption that some individuals may assert “personal influence” upon others through interpersonal communication remains. Thus, the model continues to underscore the importance of studying health campaign interventions beyond individual routes and within their social contexts.

One reason for the continued interest and research on the effects of interpersonal influence may be the recognition that campaign effects result from multiple pathways (Hornik, 2002; Hornik & Yanovitzky, 2003). The communication campaign influence model, for example, posits that campaigns can influence behaviors not only through direct exposure to the messages but also through institutional and social diffusion routes (Hornik, 2002; Hornik & Yanovitzky, 2003). At the institutional level, campaigns can influence behaviors through diffusion of messages to social institutions such as the media, religious organizations or public policy makers. An example of this effect is Yanovitzky (2002) study of mass media coverage of drunk driving on individual beliefs about drunk driving. In his analysis, Yanovitzky (2002) found no direct effect of mass media coverage on individual beliefs. However, he found media coverage of drunk driving as a public health issue increased, leading to passage of legislation to curb drunk driving. He also found an association between passage of the legislation and reductions in drunk driving behavior and fatalities. Thus, the findings suggested that while increased media messages about an issue sometimes may not directly influence individual behavior change, such changes at the institutional level could take place, which would ultimately affect behavior.

At the social level, campaigns can affect psychosocial and behavioral outcomes by generating interpersonal conversations within social networks. There are at least two ways through which social diffusion of campaign messages may operate (Hornik, 2002; Hornik & Yanovitzky, 2003). First, individuals exposed to a campaign’s messages may relay information to those not exposed to the same messages. This pathway is similar to the two-

step flow model of communication (Lazarsfeld & Katz, 1955) in that people gain new pertinent health information not directly from the media, but from those in their social networks. This differs from the two-step flow because individuals do not rely solely on "opinion leaders" to diffuse information. In the second instance, a campaign may generate discussion among all persons exposed to the messages (such as family members, partners, friends, or other community members). Through such discussions, community norms and practices may be adjusted. That is, individual's conversations with persons in their social networks can affect their normative perceptions by helping them assess whether they hold similar beliefs to those around them or whether others expect them to hold similar beliefs (Lapinski & Rimal, 2005; Rimal, 2003). Such conversations are predicted to change social norms about a particular behavior.

Social Norms

Descriptive norms are of particular interest for this study (Cialdini & Trost, 1998; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Descriptive norms are beliefs about what others actually do rather than what people think important others want them to do (Lapinski & Rimal, 2005). Evidence from both experimental and field studies demonstrate the effectiveness of targeting social norms to ultimately influence behavior (Lapinski et al., 2013; Nan & Zhao, 2015; Yanovitzky & Stryker, 2001). Hwang (2012), for instance, conducted a study to test the campaign diffusion model at the individual and community levels (Hornik & Yanovitzky, 2003). Using data from the *Truth* campaign, Hwang (2012) found evidence that exposure to the *Truth* advertisements influenced normative perceptions about drug use through interpersonal communication. However, not all research on the effects of talk on social norm awareness support this proposition. In their study on HPV vaccination, Dunlop and colleagues (Dunlop, Kashima, & Wakefield, 2010) found no effects of interpersonal communication on normative perceptions about getting the vaccine. Nevertheless, theorizing by Rimal (2003) and others on social norms does suggest a direct

effect of campaign-generated conversation on changing normative perceptions as well as an indirect effect through interpersonal communication. Influencing norms through interpersonal communication is possible because individuals can learn about the beliefs of important others as well as those in their community. Such conversations can lead to a change in normative perceptions, which in turn could engender behavior change.

Conversation Valence and Norms

Although the studies discussed earlier establish a link between interpersonal communication and psychosocial and behavioral outcomes, most studies assume campaign-related conversations are positive. In a study of adolescents and drug use, David, Cappella, and Fishbein (2006) found participating in a chat room discussion can actually produce boomerang effects. That is, the chat room discussions led to a reduction in social norms against marijuana use, primarily because the conversations were negative. Frank et al. (2012) found positive conversations following a campaign resulted in more positive norms about condom use. In that study, Frank et al. (2012) assessed the association between interpersonal communication and social norms using data collected from the BBC's Condom Normalization Campaign in India. Drawing on the integrative model of behavioral prediction (Fishbein & Cappella, 2006), the campaign was specifically designed to promote conversations about and change public perceptions of condom use in India. Frank et al. (2012) found 140 million Indian men were exposed to the campaign, and higher levels of exposure directly predicted conversations about condoms. Further, the valence of the conversations (i.e. positively talking about the messages) resulted in more positive norms about condom use. Dunlop et al. (2010) also demonstrated that conversation valence is an important factor when evaluating the effects of interpersonal conversations. In their study, Dunlop et al. (2010) conducted an experiment to examine whether norms, attitudes and intentions to get the HPV vaccine was affected by whether an individual had conversations about the vaccine, with whom, and the valence of the conversations. They asked

participants to rate the favorability of their conversations about the vaccine, and found perceptions of norms to be more positive if the conversation was more favorable towards getting the vaccine.

Together, these findings suggest that beyond merely generating discussions, the valence of conversations could be critical to understanding the effects of interpersonal discussion on social norms. If interpersonal communication is generated in an environment in which the prevailing social norms suggest that the behavior is taboo—as in the case with discussions about women who acquire and carry condoms—then there may be unintended consequences, including a greater likelihood of a backlash against the intervention.

Condom Acceptability

Prior research suggests that both young men and young women often hold the belief that young women should not acquire and carry condoms (Bell, 2009). Formative research conducted prior to this study and other work on condom access indicate that it is not normative for young women of color to engage in condom preparatory behaviors within the college environment (Warren-Jeanpiere, Sutton, et al., 2011). Young Black women were fearful of the stigma and embarrassment that accompanies visible signs of sexuality (Carmack et al., 2015; Warren-Jeanpiere, Sutton, et al., 2011). Despite this, young women do want and seek ways to improve their sexual health, which may include obtaining condoms on campus. Young women may in turn engage in conversations about the their acquisition of condoms with their friends, partners and others. Such conversations could then influence condom acceptability and norms.

Based on prior research, the following hypotheses are proposed (Figure 4):

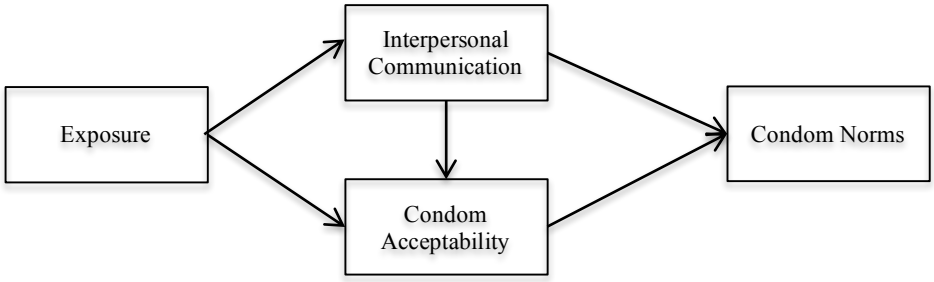
H1: Exposure to the dispenser messages will be associated with interpersonal communication and condom acceptability;

H2: Interpersonal communication will be associated with perceptions of condom acceptability and norms;

H3: Condom acceptability will be positively associated with condom norms;

H4: Interpersonal communication and condom acceptability will mediate the association between exposure and norms.

Figure 4: Proposed Model of Mediational Pathways Between Exposure and Norms



Methods

Measures

Exposure to the messages was measured by assessing the frequency of having seen the messages. Participants were shown each of the four messages in random order and then asked, "In the past 3 months, how many times would you say you saw this message on a dispenser?" Response options ranged from 0 to 81 or more times. Responses were recoded as a continuous variable ranging from 0=no exposure to 4=exposure to all four messages.

Interpersonal communication was measured was three items. Participants were first asked, "In the past 3 months, did you talk to anyone about the condom dispensers or messages?" (1 = Yes, 0 = No). Participants who said "Yes" were then asked to indicate how much they talked to their significant other or sexual partner, friends, family members, and/or physician or other medical provider about the dispensers or messages (1 = Not at all, 2 = a little, 3 = some, 4 = a lot, and 5 = very much). Responses were dichotomized to assess whom participants were most likely to talk to and combination of conversation partners. Finally, participants who talked about intervention were asked to recall what they said and

then answer the following question: “What did you say (or others say to you) about the dispensers.”

Online social sharing was measured with three items. Participants were first asked, “In the past 3 months, did you tweet, post, or share anything about the condom dispensers or messages on any social media sites?” (1 = Yes, 0 = No). Participants who said “Yes” were then asked to indicate on which sites they shared information. Options were: Instagram, Facebook, Snapchat, Twitter, YouTube, Pinterest, Vine, and other. Participants who shared information online were also asked to recall what they shared and then answer the following question: “What did you tweet, post, or share bout on social media.”

Conversation valence was measured by asking participants, “Were your conversation(s) generally for or against taking condoms from the dispensers?” Response options were: Totally against taking condoms, Somewhat against taking condoms, Somewhat for taking condoms, Totally for taking condoms.

Acceptability was measured with six items (Cronbach’s alpha at follow-up = .93, M = 3.17, SD = .98) adapted from the MCAS scale (Helweg-Larsen & Collins, 1994): (1) “It is very embarrassing to obtain condoms”; (2) “When I need condoms I often dread having to get them; (3) I think that obtaining condoms is awkward”; (4) “It would be embarrassing to be seen buying condoms in a store”; (5) “It would be embarrassing to be seen picking up free condoms”; (6) “I always feel uncomfortable when I have to get condoms” (1=strongly disagree to 5=strongly agree).

Condom norms were measured with four items (Cronbach’s alpha at follow-up = .82, M = 2.88, SD = .92): “How many of your female friends do you think…(1) talk about condoms with their sexual partners; (2) use condom during sexual intercourse; (3) carry condoms with them (4) get their own condoms” (1=none to 5=all).

Data Analysis

Structural equation modeling (SEM) using AMOS in SPSS version 22 (SPSS Inc., Chicago, IL) was used to test the proposed model and to examine the mediational pathways proposed above. SEM is advantageous over other methods for analyzing meditational pathways because this method accounts for measurement error (Stephenson, Holbert, & Zimmerman, 2006). We tested the models using the maximum likelihood estimation procedure. We set the error term for each endogenous variable at a mean of 0 and a variance of 1. We assessed model fit using the following criteria: (1) a nonsignificant $\chi 2$ statistic, (2) a comparative fit index (CFI) of .90 or greater, and (3) a root mean square error of approximation (RMSEA) less than or equal to .06 (Stephenson et al., 2006).

Results

Nearly 40% of participants (38.1%, *n* = 45) reported talking about the dispensers or messages with someone else (Table 10). Participants mainly talked to friends (*n* = 43, 36%) and partners (*n* = 33, 28%). Some talked to medical providers (*n* = 23, 20%) and family members (*n* = 18, 15%). The majority of students talked to more than one person (*n* = 34, 75.6%) and 36% of talkers (n = 16) talked with everyone (friends, partners, family, and providers). The 20% (*n* = 9) of students who said they talked to only one person all said they talked to their friends. Another 22% (*n* = 10) talked to both friends and partners.

Participants reported that the conversations were extremely positive (*M* = 3.51, *SD* = .73), and the majority (91%) said the conversations were somewhat or totally *in favor of* taking condoms from the dispensers. Participants were asked to indicate what exactly they said about the dispensers to other people (or what others said to them).

Twenty-two percent of students (n = 26) wrote about their conversations. The comments were overwhelmingly positive. Responses included that the dispensers were: “Great to have on campus;” “Good idea to have them in the dorms;” “A responsible thing [the school] has added to their campus;” and “Should be on all college campuses.” Other

conversations included messages such as, “ Take one for you and take one for a friend,” “Now we don't have to buy condoms!” “They are easy [to use]. All you do is just go to the dispenser, that way you won't be embarrassed to buy them,” and “Talked about whether students were actually gonna use the condoms and if it would lower the STD rate.” Students also talked about the need for variety in the condoms provided in the dispensers. Comments included: “They should have different sizes” and “I think they should change the type of condoms that are in there.”

Interestingly, 21% (*n* = 25) of participants shared information about the dispensers or messages on social media. Snapchat was the most popular social media site used: 15% of students shared information on Snapchat. Information about the messages/dispenser was also shared on Twitter (9%), Facebook (8%) and Instagram (5%). Participants said they mostly shared pictures of the dispensers/messages. However, one student expressed frustration that the dispensers were empty at times. She wrote, “Why every time I go to the bathroom the dispensers are empty?”

Preliminary Analyses

H1 predicted that exposure to the message would be associated with interpersonal communication and acceptability. Binary logistic regression analysis was performed to test the relationship between exposure and interpersonal communication because interpersonal communication was a dichotomous variable. Individuals exposed to the messages were significantly more likely to talk about the messages (OR = 1.38, $p = .009$, 95% CI [1.08, 1.76]). Linear regression analysis was performed to test the relationship between exposure and condom acceptability. The analysis was significant ($F(1, 114) = 4.47$, $p = .37$). There was a positive significant association between exposure and acceptability ($\beta = .19$ $t(115) = 2.11$, $p < .05$).

H2 predicted that interpersonal communication would be associated with condom acceptability and condom norms. Linear regression analysis was performed to test the

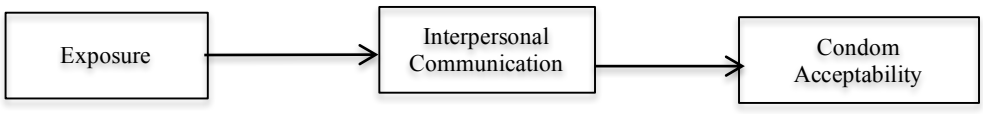
relationship between interpersonal communication and condom acceptability. The analysis was statistically significant ($F(1, 115) = 5.46$, $p = .02$). There was significant positive association between interpersonal communication and acceptability ($\beta = .21$ $t(115) = 2.34$, $p < .05$). Individuals who talked about the dispensers and messages expressed greater acceptability ($M = 4.05$, $SD = .88$) than those who didn't talk ($M = 3.62$, $SD = 1.01$). A linear regression analysis was also performed to test the relationship between interpersonal communication and condom norms. The analysis was not statistically significant ($F(1, 116) = 3.12$, $p = .08$).

H3 predicted that condom acceptability would be positively associated with condom norms. Linear regression analysis was performed to test the relationship between condom acceptability and condom norms. The analysis was not statistically significant ($F(1, 114) = .54$, $p = .47$).

Testing a Model of Conversation Effects

Given that results from the analyses above, the relationships among exposure, interpersonal communication, and condom acceptability were examined in a SEM analysis. Condom norms were dropped from this model and H4 was re-specified (Figure 5). In the new model, exposure was predicted to have a direct effect on interpersonal communication, and interpersonal communication was expected to have a direct effect on condom acceptability. The model further proposed an indirect effect of exposure on acceptability through interpersonal communication.

Figure 5: Final Model of Mediational Pathway Between Exposure and Acceptability



As demonstrated in Figure 5, the model offered a moderate fit ($\chi 2(1) = 2.10$, $p = .15$, CFI = .87, RMSEA = .08, 90% CI: 0.01–0.22). The CFI was lower than .90 and the RMSEA

lower than .06; however, a non-significant chi-square was observed. The direct effect of message exposure on interpersonal communication was .08 (p = .01), and the direct effect of interpersonal communication on condom acceptability was .42 (p = .02). There was also a positive indirect effect of exposure on condom acceptability (.03, p = .03, Table 12).

Discussion and Conclusion

The ways that interpersonal communication influences audience's psychosocial and behavioral outcomes has garnered growing attention among scholars. Thus, this paper investigated whether exposure to the messages may have influenced interpersonal communication, which in turn might influence condom acceptability and norms. Exposure to the intervention motivated students to engage in conversations about the program. Exposure to the messages also appears to have affected condom acceptability, through interpersonal communication. Interpersonal communication facilitated this effect by possibly allowing students to engage in positive conversations about the program. The students who provided information on what they talk about reinforce these findings. Although limited in scope, the conversations emphasized the benefits of having the dispensers on campus. In sum, findings from this study add to the body of literature by showing condom distribution programs and safer sex messages can generate conversations, which, in turn, may impact psychosocial outcomes.

Condom acceptability was slightly higher among individuals exposed to the messages, although the finding was not statistically significant. Further, condom acceptability was significantly higher among individuals who talked about the messages and dispensers. Unfortunately, we were not able to assess what participants said about the messages, as information given about the conversations was mostly about the dispensers. Thus, it was not possible to link content of the conversations directly to condom acceptability.

Given that overall condom acceptability did not change significantly from before to

after the intervention, the findings suggest perceptions of acceptability may have been different for certain groups of students. That is, individuals who recognized the messages and/or talked about the messages and dispensers reported less stigma and embarrassment (and thus greater comfort) than individuals who did neither. The reverse of this could also be true, in that individuals who were less embarrassed were more likely to engage in conversations around the program. Such propositions could be tested in additional research with larger, more diverse samples of students.

Almost one in five students reported sharing information on social media. Much has been written in academic and popular literature about young Black people's use of social media (Esco, 2011). Twitter in particular is a popular online site for young Blacks (Manjoo, 2010). In our study, however, Snapchat emerged as the most used social networking site to share information, mostly pictures—about the project. Snapchat is one of the newest social media sites, and one commonly used by young people. Snapchat may also be popular because of an intriguing feature built into the site – i.e., Snapchat pictures disappear shortly after posting. Motivations for using the site could be that participants do not want such pictures to be part of their public Internet profile. Nevertheless, offline and online social sharing show promise for increasing the reach – and perhaps efficacy - of such interventions.

Interpersonal communication and social sharing about the program may bode well for the future applications of campus-based condom distribution programs. Such projects may actively encourage participants to share information with their friends and partners. This is important because prior research suggests interpersonal communication between friends and partners may be an important factor influencing the effectiveness of safer sex interventions (Helme et al., 2011; Southwell & Yzer, 2007, 2009). In a study examining a condom dispenser initiative on a large college campus in Southeastern Unites States, Francis and colleagues (2016) found that, similar to findings here, most students were

aware of the dispensers on campus and many talked about the dispensers. In the prior study, half the students had read or heard information about the dispensers from multiple information sources (Francis et al., 2016). One in four students read about the dispensers online and 15% read about it in the campus newspaper. Students in turn talked to their friends and partners after seeing information about the dispensers. Findings from both studies provide evidence that peer networks may be instrumental at influencing awareness of condom distribution programs, and over time this could contribute to changing condom acquisition norms and ultimately condom use (Southwell & Yzer, 2007). To continue to promote dispenser-related conversations among friends and partners, researchers and others implementing similar projects should pursue other communication activities along with the condom distribution program. This is especially needed because the current study used only one communication channel—the dispensers—for message dissemination; the campus environment lacked a central channel, such as a student newspaper, for dispersing additional information.

Prior research also suggests that network density—that is the connectedness of a particular social network—likely affects whether conversations take place and the impacts of such conversations (Morgan, 2009). Campus environments, which are typically close-knit communities, may foster greater conversations among friends, and any changes in the campus environment may be quickly discussed within peer and partner networks (Francis et al., 2016). Additional research is needed to better understand how information about the dispensers flows across campus social networks. It may be that a few students are influencers in that they help shape the depth and breadth of conversations about the program. Alternately, such data could show that information is spread widely across different campus networks.

This is one of the first studies to directly address stigma and embarrassment about obtaining condoms through safer sex messaging. Condom distribution programs with safer

sex campaigns typically include information on condom use (Francis et al., 2016; Heard, Auvaa, & Pickering, 2015; Martinez-Donate et al., 2010), and such messages may not be sufficient to address condom acceptability. Having demonstrated a relationship between interpersonal communication and condom acceptability, it is important that future interventions include communication activities that target stigma and embarrassment.

We were not able to test the mechanisms by which interpersonal communication influenced social norms, as norms were not associated with any of the variables in the analysis. Even a closer look at norms about specific behaviors (such as obtaining and carrying condoms) failed to reveal any relationships with other variables in this study. It is possible that this behavior may not be driven by norms for this particular group of students. Young women in same gender college environments may experience less negative normative perceptions about condom acquisition and carrying compared to others. Future research is needed to assess such differences. Nevertheless, the findings add to the body of research on condom preparatory behaviors and interventions to address safer sex behaviors.

Table 10: Interpersonal Communication and Online Social Sharing

	N	%
Interpersonal communication (% yes)		
Talked about the dispensers or messages	45	38.1
Conversation partners (any)		
Friends	43	96
Partners	33	73
Providers	23	51
Family	18	40
Conversation partners (by type)		
None	2	4.4
Friends only	9	20
Multiple people	34	75.6
Online social sharing (% yes)		
Tweet, post or share	25	21.2
Social media sites (all that apply)		
Snapchat	18	15.3
Twitter	11	9.3
Facebook	8	6.8
Instagram	6	5.1
Other	3	2.5

Table 11: Correlations for Variables in the Study

		1	2	3	4
1	Exposure	-			
2	Interpersonal communication	.25**	-		
3	Acceptability	.18	.21*	-	
4	Norms	.15	.16	.07	-

Note. **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Table 12: Direct and Indirect Effects of Exposure and Condom Acceptability Through Interpersonal Communication

	Effect	Coefficient	*SE*	95% CI	*p*
Exposure → Interpersonal Communication	Direct	.08	.02	.04, 11	.012
Interpersonal Communication → Condom Acceptability	Direct	.42	.17	.17, .71	.022
Exposure → Interpersonal Communication → Condom Acceptability	Indirect	.03	.02	.01, .07	.033

CHAPTER 5

Discussion and Conclusions

Young Black women experience sexual health disparities at disproportionate rates. Condom distribution programs and communication campaigns are two approaches used to address the sexual health needs of this population. This project examined the effectiveness of a campus-wide intervention combining condom distribution – via dispensers with free condoms –with point-of-access safer sex messaging – posters with messages inserted in the dispensers – on psychosocial and behavioral outcomes.

Chapter 1 provided background on the scope of HIV/STI epidemic among young Black women; HIV/STI prevention efforts targeted at this population; and an overview of guiding theories used to understand and change risky sexual behaviors. The integrative model of behavioral prediction, theory of gender and power, and prior research on condom distribution interventions guided this study. The intention-action conceptual model was proposed to better explicate the relationship between condom access factors (availability, accessibility and acceptability), condom preparatory behaviors (condom acquisition and carrying), and condom norms, intentions, and use.

Chapter 2 described and evaluated the condom distribution program and accompanying messages conducted at an all-female HBCU in North Carolina. The findings showed the dispensers achieved extremely high awareness over a relatively short timeframe of three months. Additionally, young women took condoms from the dispensers, and some of them reported using the condoms during sexual activity. The results further revealed that the intervention was successful in increasing perceptions of condom availability and accessibility. However, condom acceptability and norms did not change, and condom

intentions and use decreased. Despite these unexpected findings, dispenser use was associated with higher condom use.

Chapter 3 examined exposure and impact of the messages designed specifically for this study. The findings showed that although some students were able to recall individual messages unprompted, the messages received low overall unaided recall but much higher recognition. Perceptions of the messages' impact were high, and message perceptions were associated with psychosocial and behavioral outcomes.

Chapter 4 tested a model to explain whether interpersonal communication acted as a mediator between exposure and condom acceptability. The path analyses revealed exposure was associated with interpersonal communication, and interpersonal communication in turn was associated with condom acceptability. Thus, talking about the messages may have increased perceptions of condom acceptability.

Overall, there are key insights to be gleaned from this study. First, condom access is a public health issue for some students, including individuals attending HBCUs. Students are interested in obtaining condoms in an environment where condoms are available and accessible. The 10 condom dispensers placed in bathrooms around campus improved condom access for students. Respondents did perceive condoms to be significantly more available and easily accessible after the dispensers were implemented. This could be because most of the dispensers were installed in dorm bathrooms, where 80% of individuals in the sample resided. During the study, almost 2,000 condoms were distributed, and students took 165 condoms each week, on average. More than 40% of students in our sample took condoms from the dispensers, and they reported taking an average of four condoms each time they went to the dispensers. These data suggest that the dispenser program achieved broach reach among students.

This study supports and extends upon previous findings on condom availability programs derived from research in high school or community settings. It contributes insights

from a specific environment – an HBCU campus serving an all-female, predominately Black population – to the existing body of knowledge around the types of venues that advance sexual health promotion for college-aged Black women. Colleges and universities should provide young people with access to condoms and other sexual health resources to motivate them to make better health decisions. Access to such resources may help reduce sexual health disparities prevalent among young Black women. Thus, this study augments existing sexual health programs at the targeted college.

Most students were exposed to the dispensers and messages, as almost 80% of students were able to recognize at least one of the messages. The majority of students (76%) recognized multiple messages. Not surprisingly, students residing in dorms were more likely to recognize the dispenser messages than those residing off-campus. In fact, more than 70% of on-campus students recognized the messages while only 30% of off-campus students recognized the messages. Specific outcomes also varied across different levels of exposure. Students who took, carried, and used condoms at last sexual intercourse were more likely to be in the high exposure group. Further, exposure was significantly associated with condom acceptability such that persons in the high exposure group reported significantly more condom acceptability compared to persons in the no exposure group

The messages were also well received by students, eliciting positive reactions. For example, participants thought the messages made them feel more comfortable taking condoms from the dispensers and confident carrying condoms. They also said the messages motivated them to take condoms from the dispensers. Further, they thought the messages were amusing and catchy. Bivariate correlations between message impact and most psychosocial and behavioral outcomes were significant. That is, message impact (ratings about how the messages made students feel, e.g. proud and empowered) was strongly, positively correlated with comfort with the dispensers, condom norms and dispenser use. Multivariate analyses confirmed the findings. Students with more positive

perceptions about the messages' impact felt more confortable with the dispensers, perceived condom behaviors to be more normative, and were one and a half times more likely to use the dispensers. High awareness of the dispensers and the association between exposure and dispenser use is consistent with other studies (Blake et al., 2003; Francis et al., 2016), which show that condom availability programs achieve high awareness over a short period of time and that awareness is often associated with condom acquisition.

Consistent with past studies (Francis et al., 2016; Helme et al., 2011), the intervention generated positive conversations across campus. We also found that students talked about the project both in person and online. Almost 40% of students reported talking about the dispensers/messages with their friends and partners, and more than 20% shared pictures and other information on social media. Our open-ended data suggest students talked about and shared information about the health promotion benefits of having the dispensers on campus. While evidence continues to grow regarding the influence of interpersonal communication on sexual health outcomes (Dunlop et al., 2010; Frank et al., 2012; Geary et al., 2007; Helme et al., 2011), less is known about the effects of online social sharing. Emerging research suggests, however, that social sharing of communication materials may amplify campaign effects (Friedman et al., 2014; Neiger, Thackeray, Burton, Giraud-Carrier, & Fagen, 2013).

Condom acceptability and norms did not change after implementation of the dispensers. However, condom acceptability was higher among individuals exposed to the messages and higher among those who talked about the messages. That is, students who recognized the messages and/or talked about the messages and dispensers reported less stigma and embarrassment (and thus greater comfort) than those who did neither. The acceptability finding is supported by other data showing that in general, students reported being extremely comfortable taking condoms from the dispensers. Students, however, were much more likely to say they were comfortable when alone than when others are watching.

Prior research also shows that young women were embarrassed to be seen taking condoms from campus bathrooms (Francis et al., 2016). In our earlier study at a large public university, the dispensers were installed in bathrooms in high traffic locations such as in the student union. In this study, given the size of the campus and number of bathrooms with condom dispensers, the dorm bathrooms may provide sufficient privacy for each student to be alone when taking condoms from the dispensers. Past research on campaign exposure and associated effects may also explain the lack of changes for condom acceptability and norms. This may be especially the case given that students rated the messages low on *likely to make them feel less embarrassed*. It may be that the messages empowered some women to obtain, carry, and perhaps even use condoms, but that they did not reduce the embarrassment of taking condoms. This suggests that the messages could be revised to align closer with the goals of this initiative – i.e., to reduce embarrassment and stigma associated with women taking and carrying condoms.

The acceptability findings also indicate a potential dose-response relationship such that the average person did not have enough exposure to have an effect, whereas those with high exposure did. This suggests the need for a campus-wide campaign in the future to support the dispensers. Evaluation of such a campaign could quantify the dose-response relationship between exposure and condom access. Research consistently supports differential effects depending on media dosage (Niederdeppe, 2014), with higher media doses often leading to more positive behavioral outcomes (Deering et al., 2011; Farrelly, Davis, Haviland, Messeri, & Healton, 2005).

These findings do not imply that embarrassment no longer matters in the context of young people's sexual health. At the heart of embarrassment is a negative evaluation by others (Bell, 2009). Attempts to avoid embarrassment still play an important role in young adult's sexual behavior. As noted by Bell (2009), "Fear of embarrassment inhibits the extent to which young people seek sexual health advice and access and use condoms." Further,

feelings of embarrassment depend on the context and perceptions of the real or imagined audience. In contexts where the populations consist of all females, as in this study, one could argue that embarrassment may be less of a concern. Conversely, an argument could be made that embarrassment may be more of an issue for young college-aged women who attend co-educational schools, where the real or imagined audience includes both males and females. In focus groups conducted prior to the intervention, young Black women attending a co-educational HBCU in North Carolina expressed embarrassment when attempting to obtain condoms on their campus. However, the religious nature of the current study's college environment suggests that embarrassment should not be dismissed easily. The findings indicating greater comfort with the dispensers when alone than when others are watching is indicative of young women's self-presentation concerns. These findings reinforce arguments that 'anonymity counts' (Bell, 2009).

The young women who decided not to take condoms may be motivated to protect their self-image, and to conform to prevailing norms about how young women should behave. Those who did use the dispensers, on the other hand, may have the skills needed to confront fears about other's reactions to their behavior. The theory of gender and power (Wingood & DiClemente, 2000) suggests that the socio-normative environment within which sexual health is enacted is important for understanding the sexual health needs and behaviors of young Black women. It could be that the campus environment could have both helped and hindered the normative environment. On the one hand, the presence of the dispensers encourages young women to take charge of their own sexual health needs. Other young women on campus may support this goal. On the other hand, the religious environment of the campus may preclude young women from acknowledging and accepting that they are having sex, and thus the need for condoms. Future research should continue to explore the role of embarrassment and stigma on young Black women's sexual behaviors.

As noted, condom norms did not change. Differing reactions to the dispensers and messages may have produced no overall effect. That is, some young women may have found the dispensers effective in increasing their perceptions of what female friends are doing; others may have found the dispensers to not change their normative perceptions or to make them think that less people are using condoms than perhaps should be. In this study, we asked students their perceptions of descriptive norms, perceptions of which behaviors their female friends perform (talking about, acquiring, carrying and using condoms). Perhaps for behaviors such as acquiring and carrying condoms, which are strong cultural taboos for young women, messages need to address not only perceptions of what others are doing but also perceptions of which behaviors are socially approved (injunctive norms) (Cialdini, 2003; Schultz et al., 2007). Lastly, individual-level factors such as age may explain the lack of change in condom norms. Older students who remained in the study may have formed normative perceptions about condom acquisition and carrying on campus relative to the younger students. Following students throughout their college years may help us better understand condom norms among this population and the most effective messages to change normative perceptions.

Condom intentions and use decreased despite improvement in condom access, which was an unexpected finding. There is no evidence that the initiative decreased condom use. Rather, condom use appeared to decrease regardless. Condom use is a behavior that is affected by individual, relationship, contextual, and other factors. The initiative may have in fact slowed the decrease, and the evidence suggests that the initiative was associated with greater condom use – i.e., particularly for students who used the dispensers. Thus, the initiative did no harm to students and was potentially beneficial to their sexual health.

It is important, however, to consider some explanations for why young women may forego condom use in general and in the context of the current study. Length of time in relationships influences condom intentions and use (Fortenberry, Tu, Harezlak, Katz, & Orr,

2002). Condom use often decreases over time among those in relationships, often over a relatively short period of time that could even be measured in weeks (Fortenberry et al., 2002). In fact, studies show that as young adults age, decreases in condom use can be seen on a month-by-month basis (Zimmerman et al., 2007). In this study, we observed what appeared to be fairly stable relationships in terms of the percentage of students who reported being in a relationship at both time points: most participants (67%) had a main or steady partner. As condom use tends to be higher at the beginning of relationships, the decrease in condom use may be more likely result from time spent in the relationships.

Young women, including young Black women, often report trust in their partner and perceived monogamous status of the relationship as motivation for not using condoms (Civic, 2000; Wingood, Camp, Dunkle, Cooper, & DiClemente, 2009; Wingood & DiClemente, 1998). With such relationships, young women may be less interested in using condoms to protect themselves from HIV/STIs. Young Black women in particular may fear loss of the relationship resulting from introducing (or re-introducing) condom use into the relationship. From that perspective, the only direction that condom use was fated to go in the current study – for most participants who were in established partnerships – was down. Fear of losing the relationship may supersede fear of contracting a disease. Loss of education and career goals from an unintended pregnancy may also not factor into their condom use decision-making when in relationships. Such fears are not unfounded, given data on sex ratio among the African American population and studies showing higher rates of concurrent sexual behaviors in places with a low male-to-female biological sex ratio (Adimora et al., 2013). Unfortunately, reductions in condom use and limited use of birth control may place young Black women at increased risk of sexually transmitted infections and unplanned pregnancies. The findings necessitate further research to understand condom use decision-making among college-aged Black women. This recommendation is supported by research showing that college graduation is a protective factor for HIV/STIs

(Painter, Wingood, DiClemente, DePadilla, & Simpson-Robinson, 2012). That is, graduating from college may reduce vulnerability to HIV/STIs among Black women. This could be because higher levels of education lead to improved financial earnings, which enable people to afford better housing and medical care, structural factors that affect HIV/STI acquisition (Freudenberg & Ruglis, 2007).

We used two different measures of condom use for this study. First, we assessed frequency of condom use in the past 3 months (never to always). We also assessed condom use at last vaginal sex. By both measures, condom use decreased overall. The study conforms to established recommendations for condom use measures in that we assessed frequency and last time, and used a relatively short recall period (Noar, Cole, & Carlyle, 2006). The study did not ask condom use specifically by partner type. Instead, the analysis relied on self-reported partner type and examined that variable in relation to condom use. It is possible that the findings may have been different if respondents were asked to indicate their condom use with specific partners. Greater specificity may have resulted in an increase in condom use for casual partners, for instance. Participants were asked to indicate their sexual and relationship status for the past 3 months. The shorter recall period gives us more confidence that they may have recalled correctly their sexual and relationship status and condom use behaviors.

If the ultimate aim of condom distribution programs were merely to increase condom acquisition, then these findings would suffice. However, as with any HIV/STI prevention intervention, researchers and others aim to increase consistent condom use and ultimately reduce HIV/STI rates among key populations. This study was successful in that we saw positive changes in antecedents to condom use, particularly condom acquisition and carrying. Research does indicate that condom acquisition and carrying may in fact be mediators between condom intentions and condom use (Bryan et al., 2002; Carvalho et al., 2015). Our findings may indicate that there might be a hierarchy of effects such that there is

a high awareness to the condom distribution program, moderate effects on intervening variables (such as condom acquisition) and low effects on the ultimate behavior of condom use. Condom distribution programs such as this one are evidence-based strategies for reducing barriers to condom access and use. Future investigations could advance research and theorizing in this area by adding skills-based education and training to enhance the effects of the initiative. For example, intervention research with African American women indicates that sexual communication and sexual assertiveness are also strong predictors of condom use and are responsive to change in behavioral interventions. Multi-channel media and interpersonal or interactive interventions addressing condom acceptability, sexual communication, and sexual assertiveness could amplify condom distribution interventions.

Strengths and Limitations

This study represents an important step in research on structural interventions on HBCU campuses. More than anything, this study highlights the importance of college campuses in general, and HBCUs in particular, as venues to assess and intervene in risky sexual behaviors among college-aged heterosexually active Black women. Our sample was highly sexually active (92% sexually active in the past 3 months), and our results elucidate the HIV/STI prevention needs of this population. The dearth of available sexual health resources on some campuses cultivates risky sexual behaviors that foster transmission of HIV/STIs young people. The elevated HIV/STI rates in the Black community and within some geographic regions also suggest the urgency of intervening with college-aged Black women. For these reasons, further intervention research is urgently needed for this particular population. Moreover, needs assessments should be conducted to understand precisely what types of resources students would find most useful and impactful.

Our findings highlight that interventions need to target heterosexually identified young Black women through gender-specific interventions in settings that are appealing and culturally relevant, such as HBCUs. In this study, through quantitative findings and open-

ended responses, participants thought the intervention was a positive program for the campus and something that enhanced the campus' sexual health environment. This indicates that college campuses, and HBCUs in particular, may be an important venue in which to engage young people. One of the strengths of this project was the enthusiasm with which the nursing staff participated in the project. The staff was central in getting buy-in from campus administrators and in coordinating implementation of the program with the campus community. The model used during for project could transfer to other contexts where sexual health promotion is needed.

From a theoretical standpoint, this study adds to our understanding of physical, social and psychological environments that prevent people from acting on their intentions. The environmental constraints that Fishbein and colleagues (Fishbein & Ajzen, 2010; Fishbein & Cappella, 2006) explicated in the integrative model have usually been operationalized as physical barriers (e.g. condom availability). Social and psychological barriers (e.g. the normative environment and embarrassment) should also be acknowledged as possible impediments to behavior change.

While this study contributes to the literature on structural interventions for HIV/STI prevention, it is not without limitations. This is a one-group pretest-posttest study design and as such, is limited in the extent to which the findings can definitively link changes in condom perceptions to implementation of the dispenser program. In particular, the lack of a control campus makes it difficult to state what would have happened in the absence of the intervention. For example, though unlikely, it is possible that perceptions of condom availability increased simply because time passed and students' perceptions changed on their own. Adding a control campus was not feasible given the funding available for the project and the feasibility of finding a matched campus and carrying out surveys on that campus. However, this study, with its pre-post longitudinal design, still makes a large contribution to gaps in the literature about effective structural-level HIV/STI prevention

interventions targeting young Black women. Future work is needed to replicate some of the findings and better understand responses to safer sexual interventions among Black women on college campuses. A longitudinal randomized controlled trial across multiple campuses could identify how these programs impact perceptions and behavior over time, perhaps including a larger campaign component to increase message exposure.

The findings are limited by the validity of self-reported data, including for condom and dispenser use. Future interventions could use innovative technologies to track the number of times and numbers of condoms students take. For example, some studies ask adolescents to record their behaviors daily using a website, mobile phone or tablet application (Impett et al., 2010). Daily experience methods may mitigate recall bias and provide for more accurate behavioral reporting. Technologies such as QR codes (which participants can scan to receive additional information) and location-based mobile phone apps could also facilitate ease of reporting data on dispenser use.

The findings are also limited by the convenience sample. We recruited students into the study as they entered the student union on campus, and most eligible students participated in the study. Both age and year in school were affected by follow-up attrition, as we retained older students in the study but lost some of the younger students. It is possible that those students who remained in the study may be different than those who dropped out – i.e., older students may have been more likely to be in more advanced relationships and reduce their condom use at follow-up, relative to younger students. Further prospective studies with probability samples of college-aged African American women are warranted.

We screened more than 300 students and we recruited almost 200 students into the study, which gave us confidence that we reached a large proportion of students enrolled at the college. The main explanation for the difficulties experienced in reaching the original 300 students proposed was the small number of students at the college itself and the difficulty reaching a majority of them. Our decision to include only those students who were

heterosexually active in the past 12 months resulted in the screening out of many students. It is possible that some of those students had *ever* been sexually active, and a more broad inclusion criteria would have resulted in a greater number of students in the study.

Social desirability – via mode differences- may also have been a factor in the study. At baseline, participants took the survey in the lobby of a highly trafficked, central location on campus. Students were given iPads to facilitate data collection because such devices afford privacy and have been effective tools for collecting data in past research (Francis et al., 2016). In theory, only the participant would know how they were responding to the questionnaire. In practice, however, participants sometimes took the survey alongside their friends. This unanticipated social factor that emerged during data collection may have motivated participants to inflate their intentions to use condoms or actual condom use. Testing effects may also have been a factor in that participants answered the same set of questions at both time points. Given that condom use decreased while other variables increased, carryover effects seems unlikely. That is, it is doubtful that participants responded better on the follow-up survey because they remembered their answers to the baseline survey. Another limitation is the timing of the study. The study was conducted over a 12-week period, with a 3-week break for Christmas occurring during the length of the study. The break required students to leave campus, which may have limited the number of students exposed to the messages as well as the number of times students could take condoms from the dispensers.

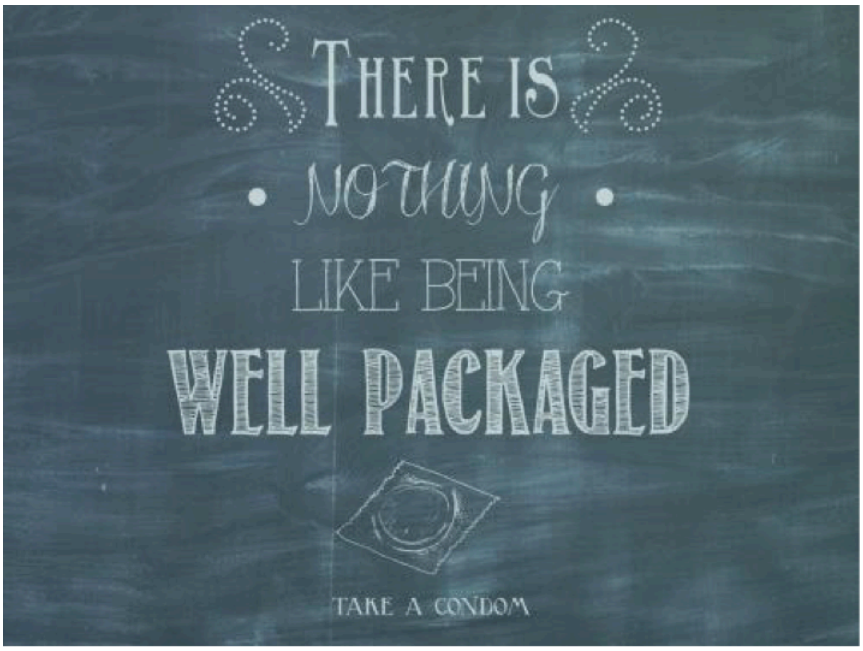
A final limitation is that this study relies primarily on one channel, posters with messages placed within the dispensers, as the main mode of message delivery. Health communication researchers often advocate for multi-channel campaigns (Noar, 2006, 2012). However, given that this study aimed to address embarrassment/stigma at the time of condom acquisition from the dispensers, placing messages within the dispensers was an attractive and somewhat effective option, as the messages were seen by a large number of

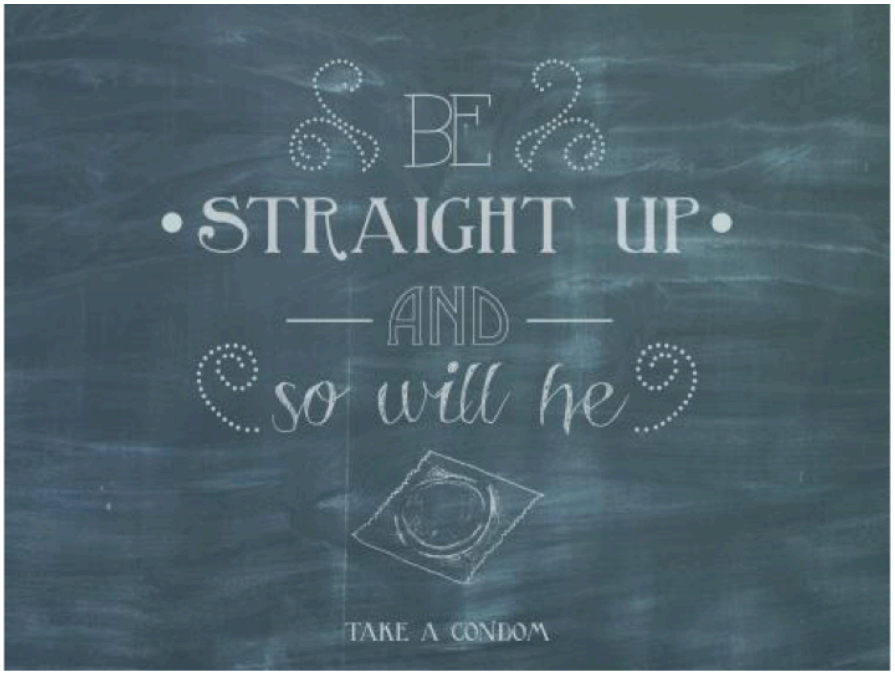
students at an opportune time (i.e., at the moment of possible condom acquisition). Future studies could combine point-of-access messaging with other media activities and conduct a larger scale campaign in this area.

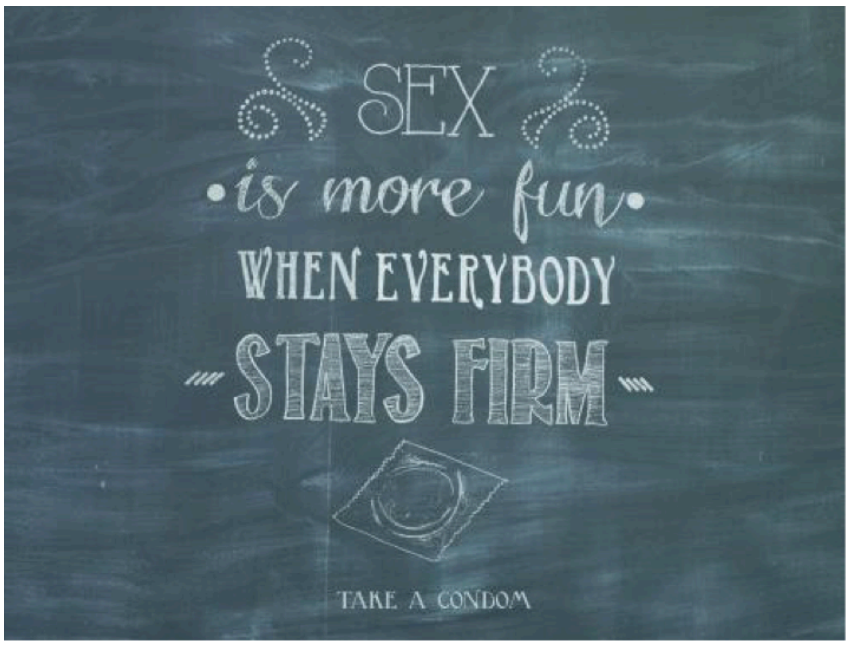
Conclusions

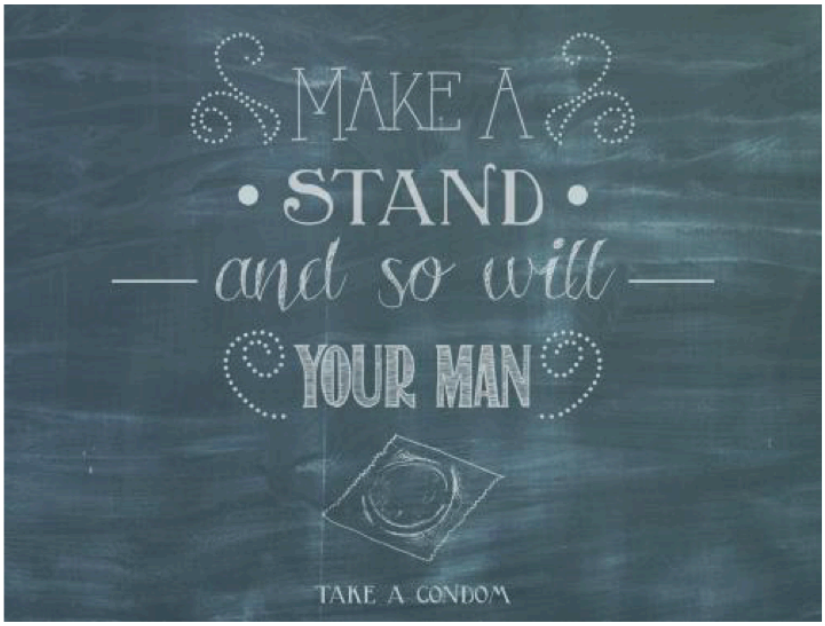
Structural interventions may be able to reduce sexual health disparities experienced by college-aged Black women, but not much is known about the impact of such interventions in a college context. This project provides empirical evidence about a structural intervention—a condom distribution program (condom dispensers with free condoms) and safer sex messaging (posters inserted in the dispensers)—on improving condom access (availability and accessibility of condoms) and condom preparatory behaviors (condom acquisition and carrying) among black women attending a small, all women's HBCU in North Carolina. The project found that the intervention achieved high awareness over a short period of time. Young Black women were responsive to the presence of condom dispensers on campus, with some talking to their friends and partners about the dispensers and messages. They also used the dispensers, and dispenser use was associated with condom use, suggesting that the dispensers filled a need for some students on campus. This project increased our understanding of HIV/STI prevention interventions targeted at college-aged young Black women.

APPENDIX A: Posters with messages

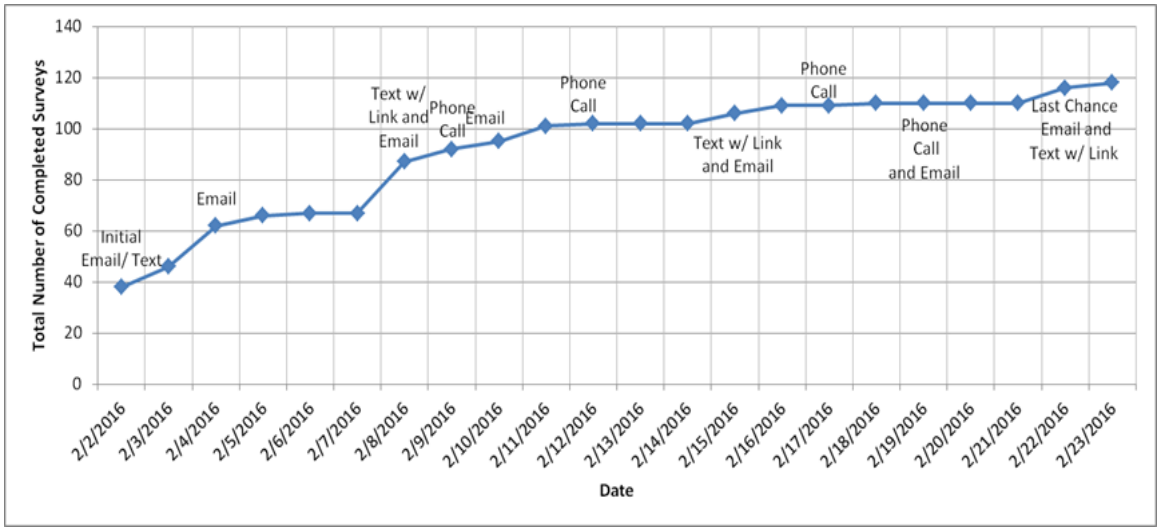





SEX
is more fun
WHEN EVERYBODY
STAYS FIRM
TAKE A CONDOM


MAKE A
STAND
and so will
YOUR MAN
TAKE A CONDOM

APPENDIX B: Timeline and contacts for follow-up data collection



APPENDIX C: Baseline survey

Q1 Thank you for your interest in this survey, which is being conducted by researchers in the UNC School of Media and Journalism. Dr. Seth Noar and Ms. Diane Francis are conducting this survey. You will be asked questions about your perceptions of the condom availability environment at Bennett College. There are no right or wrong answers - we just want to hear your opinion. The survey will take about 10-15 minutes of your time. Please answer all questions as honestly as you can. Your information will be kept confidential and your name will not be associated with any of the answers in the study. You can stop participation at any time or refuse to answer any questions in the survey, without penalty. Your participation in the study is voluntary. If you decide to be in this study, you will be one of approximately 300 people. Research is designed to benefit society by gaining new knowledge. You may not benefit personally from being in this research study. We anticipate few risks in this study. All data will be stored using the latest UNC data safety procedures to ensure that no one can access the data except study personnel. If you decide to participate in this study, you will receive $10 gift card for your participation. There are no costs associated with being in the study. If you become upset as a result of any questions in the survey, you may contact Bennett College counseling services at 336-517-2229. If you have any questions about the content of this study, please direct them to the Principal Investigators for the study: Diane Francis at dbfranci@email.unc.edu or Seth Noar at noar@email.unc.edu. All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research participant in this study, you may contact contact the UNC Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu, or Dr. Susan J. Curtis, Chair of the Bennett Institutional Review Board at 336-517-2299 or by email to scurtis@Bennett.edu. This research has been reviewed by the Institutional Review Board at The University of North Carolina at Chapel Hill and Bennett College. This is a Non-Biomedical IRB Study #14-1869. If you are interested in participating, click "next" to begin the survey.

Q2 Are you 18 years of age or older?
- ❍ No (1)
- ❍ Yes (2)

If No Is Selected, Then Skip To Do you agree to participate in this s...

Q3 Do you agree to participate in this study?
- ❍ No (1)
- ❍ Yes (2)

If No Is Selected, Then Skip To End of Survey

Q4 Each student can only take this survey one time. In order to register you for the survey, please enter a valid email address below. Also, we would like to contact you via email or text in 3 months with an opportunity to participate in a follow-up survey. (Phone numbers will be collected separately after taking the survey. Additional incentives will be offered for that survey, and you are always free to decline participation.) Valid Email Address:

Q5 PLEASE RE-ENTER YOUR EMAIL ADDRESS

Q6 Which of the following best describes your gender?
- ❍ Female (1)
- ❍ Male (2)
- ❍ Transgender (3)
- ❍ Genderqueer (4)

Q7 Age (in years, please give whole numbers):

Q8 Current year in school (give best answer):
- ❍ Freshman (1)
- ❍ Sophomore (2)
- ❍ Junior (3)
- ❍ Senior (4)
- ❍ 5th year or beyond (5)

Q9 Which of the following best describes your racial background? Check all that apply.
- ❑ White or Caucasian (1)
- ❑ Black or African-American (2)
- ❑ American Indian or Alaskan Native (4)
- ❑ Asian or Pacific Islander (5)
- ❑ Other (6) _____

Q10 Are you of Hispanic or Latino/a origin?
- ❍ No (1)
- ❍ Yes (2)

Q11 Where do you currently live?
- ❍ On-campus dorm/residence hall (1)
- ❍ Off-campus house/apartment – alone or with friends/spouse/children (2)
- ❍ Off-campus house/apartment – with parents (3)

Q12 The next several questions ask about access to condoms on campus. By “on campus” we mean places that are owned or maintained by Bennett College, including but not limited to: residence halls, dining areas, academic buildings, gyms, recreational areas, and Campus Health Services.

Q13 If you were looking for a condom today on campus, how sure are you that you would know where to go?
- ❍ Extremely unsure (1)
- ❍ Somewhat unsure (2)
- ❍ Neutral (5)
- ❍ Somewhat sure (4)
- ❍ Extremely sure (3)

Q14 If you were looking for a condom today on campus, how sure are you that you would be able to get one?
- ❍ Extremely unsure (1)
- ❍ Somewhat unsure (2)
- ❍ Neutral (3)
- ❍ Somewhat sure (4)
- ❍ Extremely sure (5)

Q15 If you were looking for a condom today on campus, how difficult or easy would it be to get one?
- ❍ Extremely difficult (1)
- ❍ Somewhat difficult (2)
- ❍ Neutral (3)
- ❍ Somewhat easy (4)
- ❍ Extremely easy (5)

Q16 In your opinion, how available are condoms on Bennett College campus?
- ❍ Not at all available (1)
- ❍ A little bit available (2)
- ❍ Somewhat available (3)
- ❍ Very available (4)
- ❍ Extremely available (5)

Q17 How often would you say you pass by a location where you can pick up a condom for free on campus?
- ❍ Never (1)
- ❍ Less than once a month (2)
- ❍ About once a month (3)
- ❍ About once a week (4)
- ❍ A few times a week (5)
- ❍ Once a day or more (6)

Q18 How often do you take condoms that are offered for free on campus?

- ❍ Never (1)
- ❍ Less than once a month (2)
- ❍ About once a month (3)
- ❍ About once a week (4)
- ❍ A few times a week (5)
- ❍ Once a day or more (6)

Q19 The next questions ask about how you feel about obtaining condoms, such as buying condoms or getting them for free. Please tell us whether you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
It is very embarrassing to obtain condoms. (1)	❍	❍	❍	❍	❍
When I need condoms, I often dread having to get them. (3)	❍	❍	❍	❍	❍
I think that obtaining condoms is awkward. (4)	❍	❍	❍	❍	❍
It would be embarrassing to be seen buying condoms in a store. (6)	❍	❍	❍	❍	❍
It would be embarrassing to be seen picking up free condoms. (7)	❍	❍	❍	❍	❍
I always feel uncomfortable when I have to get condoms. (8)	❍	❍	❍	❍	❍

Q20 The next set of questions is specifically about the sexual health environment at Bennett College. Please tell us whether you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Bennett College has a positive atmosphere in regards to sexual health. (1)	❍	❍	❍	❍	❍
I feel like Bennett College wants me to protect myself from HIV and other STIs. (2)	❍	❍	❍	❍	❍
The environment at Bennett College is one in which women can express their sexuality positively. (3)	❍	❍	❍	❍	❍
Bennett College has a supportive environment when it comes to safer sex. (4)	❍	❍	❍	❍	❍
Bennett College provides resources for students to protect themselves from HIV and other STIs. (7)	❍	❍	❍	❍	❍

Q21 Please tell us whether you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Women who carry condoms are just looking for sex. (1)	❍	❍	❍	❍	❍
Women who carry condoms sleep around a lot. (3)	❍	❍	❍	❍	❍
Men think women who carry condoms are promiscuous. (6)	❍	❍	❍	❍	❍

Q22 The next several questions ask you about where you may have obtained condoms. By that we mean either bought them or got them for free. Please read each statement carefully and answer as accurately as you can.

Q23 In the last 3 months, have you obtained condoms (for example: bought them, got them for free)?

❍ No (1)

❍ Yes (2)

If No Is Selected, Then Skip To In the last 2 months, how often did y...

Q24 In the last 3 months, how many times would you say you obtained condoms (for example: bought them, got them for free)?

❍ Never (1)

❍ Less than once a month (2)

❍ About once a month (3)

❍ About once a week (4)

❍ A few times a week (5)

❍ Once a day or more (6)

Q25 In the last 3 months, from which of the following places have you obtained condoms (for example: bought or got them for free)? Check all that apply.

- ❑ Campus Health Services (1)
- ❑ Non-Campus Health Clinic (e.g., STI clinic, family doctor) (2)
- ❑ Residence Hall (3)
- ❑ Pharmacy, Convenience Store, or Grocery Store (4)
- ❑ Campus Event (e.g.: World AIDS Day, Residence hall program) (5)
- ❑ Student Union building (6)
- ❑ Other – please specify (7) _____

Q26 In the last 3 months, from which of the following persons have you obtained condoms (for example: bought or got them for free)? Check all that apply.

- ❑ Significant other or sexual partner (1)
- ❑ Friend(s) (2)
- ❑ Family member (3)
- ❑ Research assistant (7)
- ❑ Physician or other medical provider (4)
- ❑ Other – please specify (5) _____

Q27 In the last 3 months, how often did you carry condoms with you or keep them handy?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Almost always (4)
- ❍ Always (5)

Q28 Are you carrying condoms with you right now (e.g. in your pocket, wallet, or purse)?

- ❍ No (1)
- ❍ Yes (2)

Q29 The next several statements are things that some people think are good about using condoms. Please tell us whether you agree or disagree with the following statements: IF I USED CONDOMS...

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I would feel more responsible. (1)	❍	❍	❍	❍	❍
It would build trust in our relationship. (5)	❍	❍	❍	❍	❍
My partner would feel respected. (7)	❍	❍	❍	❍	❍
Condoms would protect both of us. (9)	❍	❍	❍	❍	❍
Pregnancy would be less likely. (11)	❍	❍	❍	❍	❍
I would less likely fear sexually transmitted infections, like HIV/AIDS (12)	❍	❍	❍	❍	❍

Q30 The next several are things that some people think are bad about using condoms. Please tell us whether you agree or disagree with the following statements: IF I USED CONDOMS...

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
My partner would object. (1)	❍	❍	❍	❍	❍
Asking my partner to use condoms would be too embarrassing. (3)	❍	❍	❍	❍	❍
My partner would think I don't trust him. (4)	❍	❍	❍	❍	❍
Sex would feel less natural. (5)	❍	❍	❍	❍	❍
It would be too much trouble. (6)	❍	❍	❍	❍	❍
It would be less enjoyable. (7)	❍	❍	❍	❍	❍

Q31 The items in this section ask about your friends and about using condoms. Please read each statement carefully. HOW MANY OF YOUR FEMALE FRIENDS DO YOU THINK:

	None (1)	Few (2)	Some (3)	Most (4)	All (5)
Talk about condoms with their sexual partner(s)? (1)	❍	❍	❍	❍	❍
Use condoms during sexual intercourse? (3)	❍	❍	❍	❍	❍
Carry condoms with them? (4)	❍	❍	❍	❍	❍
Get their own condoms? (5)	❍	❍	❍	❍	❍

Q32 Do people who are important to you (such as friends) think you should use condoms with your sexual partner(s)?

- ❍ Definitely no (1)
- ❍ Probably no (2)
- ❍ Maybe (3)
- ❍ Probably yes (4)
- ❍ Definitely yes (5)

Q33 Items in this section ask about your confidence that you could use condoms in various situations. Please read each statement carefully. HOW CONFIDENT ARE YOU THAT YOU COULD USE CONDOMS:

	Not at all confident (1)	Not very confident (2)	Somewhat confident (3)	Very confident (4)	Extremely confident (5)
When you really want sex. (1)	❍	❍	❍	❍	❍
When you are affected by drugs or alcohol. (2)	❍	❍	❍	❍	❍
When your partner pressures you to take a chance this time. (3)	❍	❍	❍	❍	❍
When you are upset. (4)	❍	❍	❍	❍	❍
When there's not much risk. (5)	❍	❍	❍	❍	❍

Q34 The next set of questions asks about your plans to perform certain behaviors. Please read each statement carefully and answer as honestly as you can. HOW LIKELY OR UNLIKELY IS IT THAT YOU WILL...

	Extremely unlikely (1)	Somewhat unlikely (2)	Not sure (3)	Somewhat likely (4)	Extremely likely (5)
Use a condom the next time you have sexual intercourse (oral, vaginal or anal sex)? (2)	❍	❍	❍	❍	❍
Use a condom every time you have sexual intercourse (oral, vaginal or anal sex)? (5)	❍	❍	❍	❍	❍
Obtain condoms during the next 3 months? (3)	❍	❍	❍	❍	❍
Carry condoms or have condoms handy during the next 3 months? (1)	❍	❍	❍	❍	❍

Q35 The next questions ask about sexual partners. We define a “sexual partner” as anyone you’ve had oral, vaginal or anal sex with in the past 3 months. If you have not had a sexual partner in the past 3 months, please answer these questions about the last partner you had.

Q36 In total, how many sexual partners have you had in the past 3 months?

Q37 How would you describe those sexual partners? Again, we define a “sexual partner” as anyone you’ve had oral, vaginal or anal sex with in the past 3 months. If you have not had a sexual partner in the past 3 months, please answer these questions about the last partner you had.In general, were your partner(s)...

- ❍ Males only (1)
- ❍ Females only (2)
- ❍ Both males and females (3)

Q38 In general, were your partner(s) …

- ❍ Much younger than you (5 or more years younger) (1)
- ❍ Younger than you (2-4 years younger) (2)
- ❍ About the same age (3)
- ❍ Older than you (2-4 years) (4)
- ❍ Much older than you (5 or more years older) (5)

Q39 In general, were your partner(s)….

- ❍ A college student at the same school (1)
- ❍ A college student at a different school (2)
- ❍ Not a college student (3)

Q40 How would you describe the sexual partner(s) you have had in the past 3 months? Check all that apply:

- ❑ Main or steady partner (1)
- ❑ Casual partner (but NOT one night stand) (2)
- ❑ One night stand (3)

Q41 How many times, if any, have you had oral sex in the past 3 months?

Q42 How many times, if any, have you used a condom during oral sex in the past 3 months?

Q43 How many times, if any, have you had vaginal sex in the past 3 months?

Q44 How many times, if any, have you used a condom during vaginal sex in the past 3 months?

Q45 How many times, if any, have you had anal sex in the past 3 months?

Q46 How many times, if any, have used a condom during anal sex in the past 3 months?

Q47 Did you (or your partner(s)) use a condom the last time you had vaginal sex?

- ❍ No (1)
- ❍ Yes (2)

Q48 Thinking about all sexual behavior (oral, vaginal or anal sex) in the past 3 months, how often have you used condoms?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Very Often (4)
- ❍ Always (5)

Q49 In the past 3 months, how often did you tell any sexual partner that you wanted to use condoms?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Vey Often (4)
- ❍ Always (5)

Q50 Thinking about your sexual partner(s) please answer the following questions.

	Definitely no (1)	Probably no (2)	Maybe (3)	Probably yes (4)	Definitely yes (5)
Does your sexual partner think you should use a condom? (2)	❍	❍	❍	❍	❍
Does your sexual partner think you should provide condoms? (3)	❍	❍	❍	❍	❍

Q51 Who do you think should be responsible for providing condoms?

- ❍ Males only (1)
- ❍ Females only (2)
- ❍ Both males and females (3)

Q52 In the past 3 months, how many times have you used private technology (such as texting, Snapchat, or private Facebook messaging) to communicate (talk, text, etc.) with dating or sexual partners about the following topics? (If you have not had a sexual partner in the past 3 months, please answer these questions about the last partner you had.)

	Never (1)	Sometimes (1 to 3 times) (2)	Often (4 to 6 times) (3)	A lot (7 or more times) (4)
HIV/AIDS or other sexually transmitted infections (1)	❍	❍	❍	❍
Condoms (2)	❍	❍	❍	❍
Sexual behaviors (3)	❍	❍	❍	❍
Other (please specify) (4)	❍	❍	❍	❍

Q53 Now we are going to ask some questions about other behaviors.

Q54 In the past 12 months, have you had sex in exchange for anything, such as money, gifts, or something else?

❍ No (1)

❍ Yes (2)

Q55 In the past 12 months, how often have you used...

	Never (1)	About 1-2 times per month (2)	About 1-2 times per week (3)	About 3 times per week (4)	About every day (or every other day) (5)
Alcohol (to get drunk) (1)	❍	❍	❍	❍	❍
Marijuana (2)	❍	❍	❍	❍	❍
Powder or crack cocaine (3)	❍	❍	❍	❍	❍

Q56 Are you currently using a hormonal birth control method such as birth control pill, the patch, depo, the shot, Nuvaring, or Implanon/Nexplanon?

❍ No (1)

❍ Yes (2)

If No Is Selected, Then Skip To Have you ever used emergency contrace...

Q57 How long have you been using this birth control method?
- ❍ 1 month or less (1)
- ❍ More than 1 month but less than 6 months (2)
- ❍ 6 months or more but less than 1 year (3)
- ❍ 1 year or more (4)

Q58 Have you ever used emergency contraception (also known as the “morning-after pill” or Plan B)?
- ❍ No (1)
- ❍ Yes (2)

Q59 Have you ever used a female condom during sex?
- ❍ No (1)
- ❍ Yes (2)

Q60 These final set of questions ask about your parental education and school life. Please read each question carefully and answer to the best of your knowledge.

Q61 What is the highest level of education completed by your mother or primary female guardian?
- ❍ 9th grade or less (1)
- ❍ 10-11th grade (2)
- ❍ High school diploma or GED (3)
- ❍ 2 year technical degree or some college (4)
- ❍ 4 year Bachelor’s degree (5)
- ❍ Some graduate school or graduate degree (6)

Q62 What is the highest level of education completed by your father or other primary male guardian?
- ❍ 9th grade or less (1)
- ❍ 10-11th grade (2)
- ❍ High school diploma or GED (3)
- ❍ 2 year technical degree or some college (4)
- ❍ 4 year Bachelor’s degree (5)
- ❍ Some graduate school or graduate degree (6)

Q63 This question asks about religion, faith, and spirituality. How much do you agree or disagree with the following statements?

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I often consume religious media (such as books, magazines or TV shows). (2)	❍	❍	❍	❍	❍
I am often aware of the presence of God in my life. (9)	❍	❍	❍	❍	❍
I have a personal relationship with God. (6)	❍	❍	❍	❍	❍
When I am ill, I pray for healing. (7)	❍	❍	❍	❍	❍
I pray often. (8)	❍	❍	❍	❍	❍

Q64 Do you have any other comments about this survey or the topic of sexual health environment on your campus?

Q65 THANK YOU FOR PARTICIPATING IN THIS SURVEY! If you have any questions or concerns about your sexual health, you may contact the campus health services at Bennett College at 336-517-2230. Please click submit to complete the survey and then hand the iPad back to the study coordinator.

APPENDIX D: Follow-up survey

Q1 Thank you again for your interest in this survey, which is being conducted by Dr. Seth Noar and Ms. Diane Francis in the UNC School of Media and Journalism. The survey asks questions about your perceptions of the condom availability environment at Bennett College. There are no right or wrong answers - we just want to hear your opinion. The survey will take about 10-15 minutes of your time and you will receive a $15 gift card by email for your participation. The gift card will be delivered within 3 business days. Please answer all questions as honestly as you can. Your information will be kept confidential and your name will be not associated with any of the answers in the study. We would like to contact you with an opportunity to participate in an in-person interview. If interested, your contact information will be collected separately after taking this survey. Please click NEXT to continue

Q2 The first set of questions ask about access to condoms on campus. By “on campus” we mean places that are owned or maintained by the university, including but not limited to: residence halls, dining areas, academic buildings, gyms, recreational areas, and Campus Health Services. Please click NEXT to continue

Q3 If you were looking for a condom today on campus, how sure are you that you would know where to go?
- ❍ Extremely unsure (1)
- ❍ Somewhat unsure (2)
- ❍ Neutral (5)
- ❍ Somewhat sure (4)
- ❍ Extremely sure (3)

Q4 If you were looking for a condom today on campus, how sure are you that you would be able to get one?
- ❍ Extremely unsure (1)
- ❍ Somewhat unsure (2)
- ❍ Neutral (3)
- ❍ Somewhat sure (4)
- ❍ Extremely sure (5)

Q5 If you were looking for a condom today on campus, how difficult or easy would it be to get one?
- ❍ Extremely difficult (1)
- ❍ Somewhat difficult (2)
- ❍ Neutral (3)
- ❍ Somewhat easy (4)
- ❍ Extremely easy (5)

Q6 In your opinion, how available are condoms on the Bennett College campus?
- ❍ Not at all available (1)
- ❍ A little bit available (2)
- ❍ Somewhat available (3)
- ❍ Very available (4)
- ❍ Extremely available (5)

Q7 How often would you say you pass by a location where you can pick up a condom for free on campus?
- ❍ Never (1)
- ❍ Less than once a month (2)
- ❍ About once a month (3)
- ❍ About once a week (4)
- ❍ A few times a week (5)
- ❍ Once a day or more (6)

Q8 How often do you take condoms that are offered for free on campus?
- ❍ Never (1)
- ❍ Less than once a month (2)
- ❍ About once a month (3)
- ❍ About once a week (4)
- ❍ A few times a week (5)
- ❍ Once a day or more (6)

Q9 The next questions ask about how you feel about obtaining condoms, such as buying condoms or getting them for free. Please read each statement carefully and, after you read it, please tell us whether you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
It is very embarrassing to obtain condoms (1)	❍	❍	❍	❍	❍
When I need condoms I often dread having to get them (2)	❍	❍	❍	❍	❍
I think that obtaining condoms is awkward (3)	❍	❍	❍	❍	❍
It would be embarrassing to be seen buying	❍	❍	❍	❍	❍

condoms in a store (4)					
It would be embarrassing to be seen picking up free condoms (5)	❍	❍	❍	❍	❍
I always feel uncomfortable when I have to get condoms (6)	❍	❍	❍	❍	❍

Q10 The next set of questions are specifically about the sexual health environment at Bennett College. Please read each statement carefully and, after you read it, please tell us whether you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Bennett College has a positive atmosphere in regards to sexual health (1)	❍	❍	❍	❍	❍
I feel like Bennett College wants me to protect myself from HIV and other STIs (2)	❍	❍	❍	❍	❍
The environment at Bennett College is one in which women can express their sexuality positively (3)	❍	❍	❍	❍	❍
Bennett College has a supportive environment when it	❍	❍	❍	❍	❍

comes to safer sex (4)					
Bennett College provides resources for students to protect themselves from HIV and other STIs (5)	❍	❍	❍	❍	❍

Q11 Please tell us whether you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
People think women who carry condoms are just looking for sex (1)	❍	❍	❍	❍	❍
People think women who carry condoms sleep around a lot (2)	❍	❍	❍	❍	❍
Men think women who carry condoms are promiscuous (3)	❍	❍	❍	❍	❍

Q12 The items in this section ask about your friends and about using condoms. Please read each statement carefully and, after you read it, please tell us whether you agree or disagree with the following statements. Please click NEXT to continue

Q13 How many of your female friends do you think…

	None (1)	Few (2)	Some (3)	Most (4)	All (5)
Talk about condoms with their sexual partner(s)? (1)	❍	❍	❍	❍	❍
Use condoms during sexual intercourse? (2)	❍	❍	❍	❍	❍
Carry condoms with them? (3)	❍	❍	❍	❍	❍
Get their own condoms? (4)	❍	❍	❍	❍	❍

Q14 Do people who are important to you (such as friends) think you should use condoms with your sexual partner(s)?

- ❍ Definitely no (1)
- ❍ Probably No (2)
- ❍ Maybe (3)
- ❍ Probably yes (4)
- ❍ Definitely yes (5)

Q15 The next set of questions asks about your plans to perform certain behaviors. Please read each statement carefully and answer as honestly as you can. Please click NEXT to continue

Q16 How unlikely or likely is it that you will use a condom the next time you have sexual intercourse during the next 3 months (oral, vaginal or anal sex)?

- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Not sure (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q17 How unlikely or likely is it that you will use a condom every time you have sexual intercourse during the next 3 months (oral, vaginal or anal sex)?

- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Not sure (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q18 How unlikely or likely is it that you will obtain condoms during the next 3 months?
- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Not sure (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q19 How unlikely or likely is it that you will carry condoms or have condoms handy during the next 3 months?
- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Not sure (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q20 In November 2015, Bennett College installed 10 condom dispensers with free condoms. The dispensers are located in bathrooms in the residence halls and campus health services and are similar to the ones displayed below. All the condom dispensers have messages on them (covered by the grey box in the picture below). Take a few seconds to look at the picture below. We are first going to ask you questions about the dispensers themselves. Later in the survey, we will ask you questions about the messages that are displayed on the dispensers. Please click NEXT to continue

Q21 Have you seen, in person, any of the new condom dispensers?
- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To The condom dispensers…

Q22 In the past 3 months, did you ever use the condom dispensers?
- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To The condom dispensers…

Q23 What dispenser locations have you used? Check all that apply.
- ☐ Dorm bathroom location (1)
- ☐ Student Health Center location (2)

Q24 In the past 3 months, how many times would you say you took a condom(s) from the dispenser?

Q25 In the past 3 months, how often would you say you took a condom(s) from the dispenser?

- ❍ Never (1)
- ❍ Less than once a month (2)
- ❍ About once a month (3)
- ❍ About once a week (4)
- ❍ A few times a week (5)
- ❍ Once a day or more (6)

Q26 In the past 3 months, when you used the dispensers, how many condoms did you take each time, on average?

Q27 When you took a condom from the dispenser, would you say this was your first time ever obtaining a condom?

- ❍ Yes (1)
- ❍ No (2)

Q28 How many of the condoms that you took from the dispensers would you say that you or your partner(s) used?

- ❍ None (1)
- ❍ A few (2)
- ❍ Some (3)
- ❍ A lot (4)
- ❍ All of them (5)

Q29 How many of the condoms that you took from the dispensers did you give away to others?

- ❍ None (1)
- ❍ A few (2)
- ❍ Some (3)
- ❍ A lot (4)
- ❍ All of them (5)

Q30 Are you carrying condoms with you right now (e.g. in your pocket, wallet, or purse) that you took from one of the dispensers?

- ❍ Yes (1)
- ❍ No (2)

Q31 In the past 3 months, did you ever go to take a condom from the dispensers but it was empty?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To In the past 3 months, how many times ...

Q32 In the past 3 months, how many times did you go to take a condom from the dispensers but it was empty?

Q33 In the past 3 months, how many times would you say you took lube from the dispensers?

Q34 In general, how comfortable do you feel using the dispensers?
- ❍ Extremely uncomfortable (1)
- ❍ Somewhat uncomfortable (2)
- ❍ Neutral (3)
- ❍ Somewhat comfortable (4)
- ❍ Extremely comfortable (5)

Q35 How comfortable do you feel using the dispensers when you are alone?
- ❍ Extremely uncomfortable (1)
- ❍ Somewhat uncomfortable (2)
- ❍ Neutral (3)
- ❍ Somewhat comfortable (4)
- ❍ Extremely comfortable (5)

Q36 How comfortable do you feel using the dispensers when someone is watching?
- ❍ Extremely uncomfortable (1)
- ❍ Somewhat uncomfortable (2)
- ❍ Neutral (3)
- ❍ Somewhat comfortable (4)
- ❍ Extremely comfortable (5)

Q37 How much do you like or dislike the type of condoms that are in the dispensers?
- ❍ Dislike very much (1)
- ❍ Dislike a little (2)
- ❍ Don't like or dislike (3)
- ❍ Like a little (4)
- ❍ Like very much (5)

Q38 The dispensers are filled with 3 types of Trojan condoms. Please indicate which type of Trojan condom you most prefer:
- ❍ Trojan lubricated (1)
- ❍ Trojan Magnum (2)
- ❍ Trojan Enz (3)

Q39 Please tell us your impression of the condom dispensers on Bennett's campus. The condom dispensers…

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Will increase students' condom use (1)	❍	❍	❍	❍	❍
Fill an existing need for students (2)	❍	❍	❍	❍	❍
Will be used frequently by students (3)	❍	❍	❍	❍	❍
Are a good campus policy (4)	❍	❍	❍	❍	❍
Are convenient (5)	❍	❍	❍	❍	❍
Are useful to me (6)	❍	❍	❍	❍	❍

Q40 In the next 3 months, how likely is it that you will take a condom from one of the dispensers?

- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Neutral (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q41 In the next 3 months, how likely is it that you or your(s) partner will use a condom(s) that came from one of the dispensers?

- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Neutral (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q42 In the next 3 months, how likely is it that you will take lube from one of the dispensers?
- ❍ Extremely unlikely (1)
- ❍ Somewhat unlikely (2)
- ❍ Neutral (3)
- ❍ Somewhat likely (4)
- ❍ Extremely likely (5)

Q43 In the last 3 months, have you obtained condoms from any other source besides the condom dispensers (for example: bought them, got them from a friend)?
- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To Each of the condom dispensers had a p...

Q44 In the past 3 months, how often would you say you obtained condoms from those other sources (for example: bought them, got them from a friend)?
- ❍ Never (1)
- ❍ Less than once a month (2)
- ❍ About once a month (3)
- ❍ About once a week (4)
- ❍ A few times a week (5)
- ❍ Once a day or more (6)

Q45 In the past 3 months, from which of the following other places have you obtained condoms (by "obtained" we mean bought or got them for free)? Check all that apply.
- ❑ Campus Health Services (but not the dispensers) (1)
- ❑ Non-University Health Clinic (e.g., STD clinic, family doctor) (2)
- ❑ Residence Hall (but not the dispensers) (3)
- ❑ Pharmacy, Convenience Store, or Grocery Store (4)
- ❑ Campus Event (e.g.: World AIDS Day, Residence hall program) (5)
- ❑ Other – please specify (6) _____
- ❑ None (7)

Q46 In the past 3 months, from which of the following persons have you obtained condoms (by "obtained" we mean bought or got them for free)? Check all that apply.
- ❑ Significant Other or Sexual Partner (1)
- ❑ Friend(s) (2)
- ❑ Family member (3)
- ❑ Physician or other medical provider (4)
- ❑ Other – please specify (5) _____
- ❑ None (6)

Q47 Each of the condom dispensers had a poster with a message. Try to recall the messages that were on the dispensers and type as many of the messages below as you can remember. If you didn't see them or don’t remember any of the messages, please type "don’t remember."

Q48 Now we are going to show you each of 4 messages that were on the dispensers and ask you some questions about them. Please click NEXT to continue

Q49 In the past 3 months, how many times would you say you saw this message on a dispenser?

- ❍ 0 times (1)
- ❍ 1-5 times (2)
- ❍ 6-10 times (3)
- ❍ 11-20 times (4)
- ❍ 21-40 times (5)
- ❍ 41-60 times (6)
- ❍ 61-80 times (7)
- ❍ 81 or more times (8)

Q50 To what extent does this message make you feel comfortable taking condoms from the dispensers?

- ❍ Not at all (1)
- ❍ A little (2)
- ❍ Some (3)
- ❍ A lot (4)
- ❍ Very much (5)

Q51 In the past 3 months, how many times would you say you saw this message on a dispenser?

- ❍ 0 times (1)
- ❍ 1-5 times (2)
- ❍ 6-10 times (3)
- ❍ 11-20 times (4)
- ❍ 21-40 times (5)
- ❍ 41-60 times (6)
- ❍ 61-80 times (7)
- ❍ 81 or more times (8)

Q52 To what extent does this message make you feel comfortable taking condoms from the dispensers?

- ❍ Not at all (1)
- ❍ A little (2)
- ❍ Some (3)
- ❍ A lot (4)
- ❍ Very much (5)

Q53 In the past 3 months, how many times would you say you saw this message on a dispenser?

- ❍ 0 times (1)
- ❍ 1-5 times (2)
- ❍ 6-10 times (3)
- ❍ 11-20 times (4)
- ❍ 21-40 times (5)
- ❍ 41-60 times (6)
- ❍ 61-80 times (7)
- ❍ 81 or more times (8)

Q54 To what extent does this message make you feel comfortable taking condoms from the dispensers?

- ❍ Not at all (1)
- ❍ A little (2)
- ❍ Some (3)
- ❍ A lot (4)
- ❍ Very much (5)

Q55 In the past 3 months, how many times would you say you saw this message on a dispenser?

- ❍ 0 times (1)
- ❍ 1-5 times (2)
- ❍ 6-10 times (3)
- ❍ 11-20 times (4)
- ❍ 21-40 times (5)
- ❍ 41-60 times (6)
- ❍ 61-80 times (7)
- ❍ 81 or more times (8)

Q56 To what extent does this message make you feel comfortable taking condoms from the dispensers?

- ❍ Not at all (1)
- ❍ A little (2)
- ❍ Some (3)
- ❍ A lot (4)
- ❍ Very much (5)

Q57 Think about the 4 messages you just saw. To what extent do the messages make you feel…

	Not at all (1)	A little (2)	Some (3)	A lot (4)	Very much (5)
Comfortable taking condoms from a dispenser? (1)	❍	❍	❍	❍	❍
Less stigmatized taking condoms from a dispenser? (2)	❍	❍	❍	❍	❍
Less embarrassed taking condoms from a dispenser? (3)	❍	❍	❍	❍	❍
Proud taking condoms from a dispenser? (4)	❍	❍	❍	❍	❍

Q58 Think about the 4 messages you just saw. To what extent do the messages make you feel…

	Not at all (1)	A little (2)	Some (3)	A lot (4)	Very much (5)
At ease carrying condoms? (1)	❍	❍	❍	❍	❍
More empowered carrying condoms? (2)	❍	❍	❍	❍	❍
Confident carrying condoms? (3)	❍	❍	❍	❍	❍

Q59 Think about the 4 messages you just saw and answer the following items.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
The messages are memorable to me (1)	❍	❍	❍	❍	❍
The messages are catchy to me (2)	❍	❍	❍	❍	❍
The messages are amusing to me (3)	❍	❍	❍	❍	❍
The messages are relevant to me (4)	❍	❍	❍	❍	❍
The messages make me more likely to take a condom from a dispenser (5)	❍	❍	❍	❍	❍

Q60 In the past 3 months, did you talk to anyone about the condom dispensers or messages?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To Did you tweet, post or share anything...

Q61 How much would you say you talked to the following people about the dispensers or messages?

	Not at all (1)	A little (2)	Some (3)	A lot (4)	Very much (5)
Significant Other or Sexual Partner (1)	❍	❍	❍	❍	❍
Friend(s) (2)	❍	❍	❍	❍	❍
Family member (3)	❍	❍	❍	❍	❍
Physician or other medical provider (4)	❍	❍	❍	❍	❍
Other – please specify (5)	❍	❍	❍	❍	❍

Q62 Were your conversation(s) generally for or against taking condoms from the dispensers?

- ❍ Totally against taking condoms (1)
- ❍ Somewhat against taking condoms (2)
- ❍ Somewhat for taking condoms (3)
- ❍ Totally for taking condoms (4)

Q63 What did you say (or others say to you) about the dispensers? Try to recall and type it in. If you don’t remember what you talked about, please type "don’t remember."

Q64 In the past 3 months, did you tweet, post or share anything about the condom dispensers or messages on any social media sites?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To The last set of questions ask about y...

Q65 On which social media sites did you tweet, post, or share information about the condom dispensers or messages? (Check all that apply)

- ❑ Instagram (1)
- ❑ Facebook (2)
- ❑ Snapchat (3)
- ❑ Twitter (4)
- ❑ YouTube (5)
- ❑ Pinterest (6)
- ❑ Vine (7)
- ❑ Other (8) _____

Q66 What did you tweet, post, or share about on social media? Try to recall and type it in. If you don't remember what you posted, please type "don't remember."

Q67 The last set of questions ask about your sexual partners and sexual behavior. We define a "sexual partner" as anyone you've had oral, vaginal or anal sex with in the last 3 months. Please answer these questions thinking about all partners together. Please click NEXT to continue

Q68 In total, how many sexual partners have you had in the past 3 months?

If In total, how many sexual p... Is Equal to 0, Then Skip To Did you (or your partner(s)) use a co...

Q69 How would you describe those sexual partners? In general, were your partner(s) …

- ❍ Males only (1)
- ❍ Females only (2)
- ❍ Both male and female (3)

Q70 In general, were your partner(s) …

- ❍ Much younger than you (5 or more years younger) (1)
- ❍ Younger than you (2-4 years younger) (2)
- ❍ About the same age (3)
- ❍ Older than you (2-4 years older) (4)
- ❍ Much older than you (5 or more years older) (5)

Q71 In general, were your partner(s)…. Check all that apply

- ❑ A college student at the same school (1)
- ❑ A college student at a different school (2)
- ❑ Not a college student (3)

Q72 How would you describe your sexual partner(s)? Check all that apply:

- ❑ Main or steady partner (1)
- ❑ Casual partner (but NOT one night stand) (2)
- ❑ One night stand (3)

Q73 Think about all your sexual behavior in the past 3 months, then answer the following questions. Please click NEXT to continue

Q74 How many times, if any, have you had oral sex in the past 3 months?

Q75 How many times, if any, have you used a condom during oral sex in the past 3 months?

Q76 How many times, if any, have you had vaginal sex in the past 3 months?

Q77 How many times, if any, have you used a condom during vaginal sex in the past 3 month?

Q78 How many times, if any, have you had anal sex in the past 3 months?

Q79 How many times, if any, have you used a condom during anal sex in the past 3 months?

Q80 Thinking about all sexual behavior (oral, vaginal or anal sex) in the past 3 months, how often have you used condoms?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Very often (4)
- ❍ Always (5)

Q81 In the past 3 months how often did you tell any sexual partner that you wanted to use condoms?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Almost always (4)
- ❍ Always (5)

Q82 Did you (or your partner(s)) use a condom the last time you had vaginal sex?

- ❍ Yes (1)
- ❍ No (2)

Q83 Does your sexual partner(s) think you should use a condom?
- ❍ Definitely no (1)
- ❍ Probably no (2)
- ❍ Maybe (3)
- ❍ Probably yes (4)
- ❍ Definitely yes (5)

Q84 Does your sexual partner(s) think you should provide condoms?
- ❍ Definitely no (1)
- ❍ Probably no (2)
- ❍ Maybe (3)
- ❍ Probably yes (4)
- ❍ Definitely yes (5)

Q85 Who do you think should be responsible for providing condoms?
- ❍ Males only (1)
- ❍ Females only (2)
- ❍ Both males and females (3)

Q86 Do you have any other comments about this survey?
- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To We would like to contact a small numb...

Q87 Please enter any comments in the box below...

Q88 We would like to contact a small number of students for an in-person interview. We would provide $35 for participating in a 60-minute interview. Would you be interested in participating in a future in-person interview about the condom dispensers?
- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To End of Survey

Q89 Please fill in your contact Information for the in-person interview.

Name (1)
Email Address (7)
Phone Number (xxx-xxx-xxxx) (8)

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