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Adapting a Brief Evidence-Based Intervention
for Text Message Delivery to Young Adult Black Women

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Nursing

by

Tiffany Monique Montgomery

2016

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ABSTRACT OF THE DISSERTATION

Adapting a Brief Evidence-Based Intervention for Text Message Delivery to Young Adult Black Women

by

Tiffany Monique Montgomery

Doctor of Philosophy in Nursing

University of California, Los Angeles, 2016

Professor Deborah Koniak-Griffin, Chair

Young adult Black women have the highest sexually transmitted disease rates among all U.S. women. There are several evidence-based interventions (EBIs) targeted toward this population, yet they each require travel to a healthcare facility or other location. With the increased use of mobile devices, mobile health technology is being utilized more frequently to deliver health interventions. Instead of creating entirely new technologically savvy interventions, the CDC recommends adaptation of EBIs. The purpose of this study was to adapt an EBI for delivery via text messages.

This two-phase, mixed methods pilot study was guided by several philosophical underpinnings (empiricism, critical theory, pragmatism, and intersectionality) and theories (Social Cognitive Theory, Theory of Planned Behavior, and Theory of Gender and Power). A modified version of the ADAPT-ITT model was also used to guide the study. During phase one,

a research advisory board was recruited to assist with intervention adaptation, phase two recruitment strategies, and interpretation of study results. In phase two, the newly adapted intervention was pilot tested among a sample of young adult Black women ($n = 88$), who were randomized to the intervention or control group. Study outcomes included intervention acceptability and feasibility, and preliminary changes in condom use, condom-use self-efficacy and intention, and sexual relationship power.

Acceptability and feasibility of the intervention were high. The overwhelming majority of comments from intervention group participants were positive. Between baseline and follow-up, condom use frequency increased among participants in both study groups. However, there was no significant time by group interaction. Furthermore, while condom use self-efficacy and intention significantly increased among participants in both groups, no time by group interaction was found. Finally, intention was identified as a main predictor of condom use at baseline and follow-up.

The results of this study provide support for intervention modifications that may strengthen outcomes in a future efficacy study of the revised S2S text messaging intervention. It is important that women's health researchers and educators continue to adapt and evaluate interventions using technologically advanced methods of delivery. Text messaging is a promising method of delivery for EBIs aimed at the reduction of high-risk sexual behaviors among young adult Black women. Intervention adaptation using other types of technology should be investigated as well.

The dissertation of Tiffany Monique Montgomery is approved.

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DEDICATION

To my Godchildren: Maniah Elise, Anisa Francis, Xavier Chase, and Alexander Maxwell.

You can be anything you want to be. Don't believe anyone who tells you otherwise.

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CHAPTER 1 - INTRODUCTION

High-risk sexual behavior (HRSB) is a serious public health issue in the United States (U.S.). The risks associated with HRSB include contracting sexually transmitted diseases (STDs) like chlamydia, gonorrhea, syphilis, and the Human Immunodeficiency Virus (HIV). In the absence of contraception, HRSB can also lead to unintentional pregnancy. As with many other U.S. public health concerns, STDs and unintentional pregnancy are health disparities that disproportionately affect vulnerable populations. The population most commonly affected by the negative health outcomes of HRSB is 18 to 24-year-old Black women.

Background

Defining Young Adult Black Women

Young adult Black women constitute a very specific segment of an extremely diverse ethnic group. As of the most recent U.S. census, there were more than 2.7 million 18 to 24-year-old Black women in the U.S. These women account for less than 1% of the entire U.S. population, 8% of the U.S. young adult population, and 6.6% of the Black population, according to the United States Census Bureau ([Census Bureau], 2012a).

The Census Bureau (2012b) defines *Blacks* as those with “origins in any of the black racial group of Africa”. They also define *African Americans* in the same manner, making no distinction between the two groups. They go on to write that Blacks and African Americans may self-identify as being Sub-Saharan African, or Afro-Cuban. Although the Census Bureau and many other sources of health literature make no distinction between the terms *Black* and *African American*, there is indeed a distinction to be made. Cherry and Giger (2008) define African Americans as those of a combined African and American cultural heritage, in contrast to Black

Americans who are defined as those of an African biological or racial identity. In this sense, all African Americans are Black, but not all Blacks are African American.

When reporting race/ethnicity data, the Census Bureau only uses the term *Black* (Census Bureau, 2012a, 2012b). To account for those with ancestry from more than one ethnicity, the Bureau separates Blacks into two categories: *Black Alone* and *Black Alone or in Combination*. In like manner, the Centers for Disease Control and Prevention ([CDC], 2015c) separates Blacks from those who may be partially Black; they label the former category *Blacks, non-Hispanic* or *Black/African-American* and the latter *Multirace or Multiple Races*. In order to provide the most comprehensive demographic information regarding those of self-identified Black ethnicity, but not those who self-identify as multi- or biracial, information presented in this dissertation utilizes data collected from the *Blacks Alone* category of the U.S. census and the *Blacks, non-Hispanic* and *Black/African-American* categories of CDC reports.

Defining High-Risk Sexual Behavior

HRSB is defined by the Department of Health and Human Services ([DHHS], 2015) as participation in receptive anal or vaginal sex without the use of a condom. Male participation in vaginal intercourse is *risky* sexual behavior, but not *high-risk* sexual behavior. Insertive vaginal sex is another risky, yet not *high-risk*, sexual behaviors. Giving and receiving oral sex are low-risk sexual behaviors (DHHS, 2015). According to these definitions, heterosexual women engage in HRSB anytime they participate in unprotected vaginal or anal intercourse, while heterosexual men can only engage in risky sexual behavior during vaginal or anal intercourse.

While DHHS (2015) is explicit in its definition of HRSB, it fails to address conditions under which condom nonuse is inappropriately labeled as HRSB. The definition provided by DHHS (2015) is based solely on behavioral factors. However, there are non-behavioral factors,

including current health status, that are also associated with a person's risk for negative health outcomes. For instance, if neither sexual partner has an STD, both partners are monogamous, and a non-barrier form of contraception is utilized appropriately, there is no risk of STD transmission or unintentional pregnancy associated with condom nonuse. Thus, condom nonuse in a mutually monogamous sexual relationship, among sexual partners who have tested negative for STDs, is not an act of HRSB.

The terms *HRSB*, *unprotected sex*, and *condom nonuse* are often used interchangeably to describe inconsistency of condom use or condom nonuse. HRSB and unprotected sex, however, are not always synonymous with condom nonuse. By mere virtue of its wording, HRSB describes any behavior which directly increases the health risks associated with sexual intercourse. Likewise, the term *unprotected sex* implies lack of protection from the health risks associated with sexual intercourse. Thus, HRSB and unprotected sex may be used interchangeably.

Unlike HRSB and unprotected sex, condom nonuse does not always increase a couple's risk for STDs or unintentional pregnancy. As such, it is important to distinguish the unique aspects of HRSB and condom nonuse so as to prevent confusion and misinformation. It is also important to acknowledge condom misuse as a potential cause of STDs and unintentional pregnancy. Each of these terms should be used with great discretion.

Scope of the Problem

According to Copen, Chandra, and Febo-Vazquez (2016), 85.6% of 18 to 24-year-old women and 96.3% of Black women in the U.S. have engaged in heterosexual intercourse. Of those who report using contraception, only 21.4% of 18 to 24-year-old women and 16.3% of Black women report any condom use (Daniels, Daugherty, Jones, & Mosher, 2015). Thus,

HRSB remains a serious public health issue. While STDs and unintentional pregnancy remain negative health outcomes of HRSB, the risk of these conditions is not comparable for every incidence of HRSB. If a young woman consistently and correctly uses a non-barrier method of contraception, her risk for pregnancy is low. However, this form of contraception does not decrease her risk for STDs. Thus, pregnancy is *sometimes* a risk associated with HRSB, while STDs are *always* a risk associated with this behavior. As such, this study prioritizes STD risk over pregnancy risk.

Blacks constitute only 12.8% of the U.S. population (Census Bureau, 2012a), yet they account for 27.8% of all chlamydia diagnoses, 48.9% of gonorrhea diagnoses, 36.3% of syphilis diagnoses, and 44.1% of HIV diagnoses (CDC, 2015c). Young adult Black women, age 18-24, have the highest rate of chlamydia and gonorrhea in the U.S., and the highest rates of syphilis and HIV among U.S. women.

Chlamydia is the most reported STD in the U.S. Among young adult Black women, age 15-19, the rate of chlamydia is 1.8 to 14 times higher than their non-Black, female peers. Likewise, young adult Black women, age 20-24, have a chlamydia rate that is 1.6 to 8.9 times higher than their non-Black, female peers (CDC, 2015c). The second most reported STI in the U.S. is gonorrhea. These rates are 3.2 to 49.7 times higher among 15 to 19-year-old Black women than their non-Black, female peers and 2.2 to 33.4 times higher among 20 to 24-year-old Black women than their non-Black, female peers (CDC, 2015c).

For the first time in many years, 15 to 19-year-old Black women do not have the highest rate of syphilis among their peers (CDC, 2015c). However, their syphilis rate is 6.1 to 10.3 times higher than all other 15 to 19-year-old U.S. women, except American Indian/Alaska Natives.

And, at a rate of 2 to 18.8 times higher than all other women, 20 to 24-year-old Black women still have the highest rate of syphilis among women (CDC, 2015c).

Unlike chlamydia, gonorrhea, and non-congenital syphilis, HIV can be transmitted by means other than sexual contact. Still, heterosexual intercourse with a person known to have or be at high-risk for HIV accounts for 43% of the HIV diagnoses among Black women (CDC, 2015c). The number of HIV diagnoses resulting from heterosexual intercourse is 4.4 to 74 times higher among 15 to 19-year-old Black women than among their non-Black, female peers. Likewise, the number of HIV diagnoses resulting from heterosexual intercourse is 3.8 to 241 times higher among 20 to 24-year-old Black women than among their non-Black, female peers (CDC, 2015c).

The female reproductive anatomy makes women more susceptible to STDs than men and can hinder their ability to visualize STD outbreaks. As such, women often present with asymptomatic infections (CDC, 2011a). In addition to the potential for spreading untreated infections, some STDs can have long lasting effects. Specifically, untreated chlamydia and gonorrhea can lead to issues with pelvic inflammatory disease and infertility (CDC, 2015c). Moreover, early identification and treatment of HIV can increase the quality of life for women who are HIV positive. Thus, women should be tested for STDs even when signs and symptoms are not present.

Overview of the Literature

As researchers gain a better understanding of the determinants of HRSB, interventions are implemented to combat these behaviors. Traditional, face-to-face interventions have been shown to be effective among Black women, but the introduction of technologically advanced interventions is warranted for those who prefer its use. Based on their high rates of text

messaging among young adult Black women, this is a model platform for the delivery of HRSB interventions targeted at this population. A review of the literature helps to support this idea.

Determinants of Negative Sexual Health Outcomes

The high STD rates of young adult Black women are the basis for the identification of a sexual health disparity within this population. However, the sexual behaviors of Black women do not differ greatly from the sexual behaviors of non-Black women (Chandra, Mosher, Copen, & Sionean, 2011; Daniels, Mosher, & Jones, 2013; Hogben & Leichliter, 2008; Kogan et al., 2010; Newman & Berman, 2008). With this in mind, other causes of sexual health disparities should be investigated.

According to Hogben and Leichliter (2008), the health of young adult Black women is influenced by their location of primary residence, healthcare access and utilization, and socioeconomic status. The high homicide and incarceration rates of young adult Black men also influence sexual health disparities because of their negative effect on the pool of available heterosexual (Chesson, Kent, Owusu-Edusei, Leichliter, & Aral, 2012; Swartzendruber, Brown, Sales, Murray, & DiClemente, 2012; Thomas, 2006; Thomas, Torrone, & Browning, 2010; Valentine, 2008). Furthermore, young adult Black women are involved with men who maintain concurrent relationships more often than other women (Waldrop-Valverde et al., 2013).

Engaging in a sexual relationship with someone who is simultaneously engaged in another sexual relationship increases the likelihood of STD transmission, unless all parties involved practice safe sex. The longer these simultaneous relationship lasts, the higher the risk for contracting STDs (Epstein & Morris, 2011). As the number of available men decreases in the Black community, the number of concurrent sexual relationships increases. If the men in these

relationships contract an STD, the number of women who may also contract that STD is multiplied.

Underreporting of sexual health outcomes, including incomplete data entry (Beltran, Harrison, Hall, & Dean, 2011; CDC, 2015c) and higher screening rates among ethnic minorities and low-income women (Carter, Kraft, Hatfield-Timajchy, Hock-Long, & Hogben, 2011; Chow, de Bocanegra, Hulett, Park, & Darney, 2012; Farr, Kraft, Warner, Anderson, & Jamieson, 2009), also contribute to sexual health disparities. Lastly, utilization of long-acting reversible contraception (LARC) may contribute to STD disparities among young adult Black women. Using LARC, like intrauterine devices and contraceptive implants, provides sufficient protection against pregnancy, but this pregnancy prevention method does not adequately protect against STDs. Therefore, dual contraception remains an important sexual health practice. Unfortunately, this practice is not often used (Daniels et al., 2015; Murray et al., 2013; Peipert et al., 2011; Sales, Latham, Diclemente, & Rose, 2010).

Theoretical Constructs of HRSB

The use of theories to assist in the conceptualization and design of HRSB interventions is essential to these interventions' efficacy (CDC, 1999; Melnyk & Morrison-Beedy, 2012). Self-efficacy, intention, and power are often used in the theoretical frameworks of successful HRSB interventions.

Self-efficacy is identified as a construct of the Social Cognitive Theory (SCT). SCT is both a learning theory and behavior change theory. It purports that learning occurs through symbolism, forethought, vicarious learning, self-regulation, and self-reflection (Bandura, 1986). As it relates to health behaviors, there are five major constructs of SCT: knowledge, self-efficacy, outcomes, goals, and facilitators/barriers (Bandura, 2004). Self-efficacy has been cited

as one of the most important constructs of HRSB (Crepaz et al., 2009), yet it should not be used as the lone predictor of condom use as risky sexual behavior may be due to factors other than low self-efficacy (Cochran & Mays, 1993).

Intention is a construct of the Theory of Planned Behavior (TPB). This is a theory of behavior prediction that claims that beliefs influence attitudes, subjective norms, and perceived behavioral control. The result of these influences is the intention to perform a behavior (Ajzen, 1991). However, intention is not always a predictor of HRSB, especially when the intention of one sexual partner does not match the intention of the other.

Power is a construct of the Theory of Gender and Power (TGP). TGP is a theory of the power imbalances between men and women in sexual relationships. It is neither a learning or behavior change theory, but rather a theory of gender relations. There are three constructs of TGP: labor, power, and cathexis (Connell, 1987). Attention to power has been noted to increase the efficacy of HRSB interventions (Crepaz et al., 2009).

A Model Evidence-Based HSRB Intervention for Black Women

Sister to Sister is an example of an evidence-based HRSB intervention for use among Black women (CDC, 2015a). The single-session HIV intervention was created as an adaption of their Sister to Sister—Respect Yourself! Protect Yourself! Because You Are Worth It! program (Jemmott, Jemmott, & O'Leary, 2007). It is recommended by the CDC (2015a) as a best-evidence HIV prevention model for use among Black women in individual or group settings. The three major themes of the intervention include family and community, caring, and self-worth. It utilizes a brochure, video clips, role-play, and condom use skill building to increase beliefs, communication, confidence, condom use skills, knowledge, and self-efficacy related to

prevention of HIV. It is commercially available through ETR (2016) and has been widely disseminated throughout the U.S.

The Sister to Sister intervention has been shown to significantly increase condom use and significantly decrease the prevalence of STDs among intervention participants (Jemmott et al., 2007). Furthermore, the intervention developers found no significant differences between the participants in the 20-minute individual session and those in the 3.33-hour group session. These findings are an important indicator that group interventions are not always necessary to achieve positive health outcomes. However, its utilization as a clinic-based intervention may be a barrier for women who lack health insurance or transportation to a local health clinic. Alternative modes of intervention delivery should be investigated for women who would like to participate in HRSB education using methods other than traditional face-to-face delivery.

Moving from Traditional to Mobile Health Interventions

Of the 98% of 18 to 29-year-old young adults who own mobile phones (Pew Research Center, 2016), more than 97% engage in text messaging (Duggan, 2013; Smith, 2015). Because they use technology much more frequently and in a much different manner than the generations before them, technologically advanced learning environments are needed for today's young adults. Mobile virtual learning environments and texting are two such ways to enhance the educational experience of this population (Rosen, 2009). Several text message interventions have been shown to decrease HRSB among intervention participants (Gold, Aitken, et al., 2011; Gold, Lim, et al., 2011; Reback et al., 2012; Suffoletto et al., 2013). Yet, none of these interventions were created for or studied among a sample of majority young adult Black women.

The use of culturally-appropriate and gender-specific components of behavioral interventions is highly recommended (Alleyne & Gaston, 2010; CDC, 2014; Melnyk &

Morrison-Beedy, 2012). Instead of continuing to create entirely new interventions, however, adaptation of effective interventions should be considered (Castro, Barrera Jr., & Holleran Steiker, 2010; Chen, Reid, Parker, & Pillemer, 2013; McKleroy et al., 2006; Villarruel, Jemmott, & Jemmott, 2005; Wingood & DiClemente, 2008).

Study Purpose

The purpose of this two-phase, mixed methods study is to adapt a text message version of the Sister to Sister intervention for use among young adult Black women. The ADAPT-ITT model (Wingood & DiClemente, 2008) was used to guide the adaptation. During phase one, a research advisory board was recruited to assist in the intervention development. They also helped to select appropriate phase two recruitment strategies, test out the text messages on the messaging platform, and interpret phase two results. Mixed methods were utilized to analyze the RAB findings. During phase two, the text message intervention was pilot tested as part of a randomized controlled trial. Mixed methods were utilized to assess the acceptability and feasibility of the newly adapted intervention. Quantitative methods were also utilized during phase two to analyze condom use, condom use self-efficacy, condom use intention, and sexual relationship power.

Specific Aims, Research Questions, and Hypotheses

Aim 1: Adapt the current Sister to Sister curriculum into 160-character S2S text messages.

RQ 1. Which sexual health content from the curriculum should be used in the text messages?

RQ 2. How can STD information be incorporated into the new curriculum?

RQ 3. What types of skill-building exercises can be incorporated into the new intervention?

RQ 4. How frequently should S2S text messages be sent?

RQ 5. What is an appropriate duration for the S2S intervention?

Aim 2. Determine the acceptability and feasibility of the S2S intervention.

RQ 6. What do participants like/dislike about the intervention?

RQ 7. What is the degree of active participation in the intervention as determined by the number of video links clicked, the number of videos watched to completion, and the number of participants who remained opted-in to the text messages throughout the entire eight weeks?

RQ 8. What unanticipated issues arose that should be addressed in a future study of the intervention?

Aim 3. Compare the primary outcome (condom use behaviors) and secondary outcomes (condom use self-efficacy, condom use intentions, and sexual relationship power) among the young adult Black women in the S2S intervention group with those of the control group.

RQ 9. Is there a difference in baseline and post-intervention measures of condom use between the intervention and control groups?

Hypothesis 1. Young adult Black women receiving S2S will have a significant increase in condom use from baseline to post-intervention, in comparison to those in the control group.

RQ 10. Is there a difference in baseline and post-intervention condom use self-efficacy, condom use intentions, and sexual relationship power between the intervention and control groups?

Hypothesis 2. Young adult Black women in the S2S group will have significant increases in condom use self-efficacy, condom use intentions, and sexual relationship power from baseline to post-intervention, in comparison to those in the control group.

RQ 11. What is the relationship between condom use self-efficacy, condom use intentions, sexual relationship power, socio-demographic characteristics, and condom use?

Hypothesis 3. At post-intervention, condom use among young adult Black women will be associated with condom use self-efficacy, condom use intentions, sexual relationship power and socio-demographic characteristics.

Study Significance

The high rate of STDs among young adult Black women is a health disparity affecting an especially vulnerable population. Thus, decreasing the prevalence of STDs is a national health goal (DHHS, 2012). Not only is improved condom use with main partners needed among Black young adult women, but increased condom use among casual partners should also be a point of focus among these women. Furthermore, the attention given to condom use during both vaginal and anal sex is greatly needed, as both of these types of sexual intercourse place women at high-risk for STDs.

The adaptation of Sister to Sister from a face-to-face intervention to a mobile phone intervention will allow the intervention to be promoted in various new settings. Previously, only clinical staff could implement the intervention and the staff had to be specially trained (ETR, 2016). As a text-messaging program, the intervention can be promoted by schools, community centers, health clinics, and churches and implemented with young adults outside of the traditional healthcare settings.

The findings of this research study will help other researchers to understand how to adapt an evidence-based intervention from a face-to-face model to an innovative mHealth model.

There is a strong need for effective mHealth interventions. Receiving a HRSB intervention via text message may decrease barriers to health education associated with lack of time or access to quality healthcare facilities. The use of mHealth removes the burden of trying to find the time to learn about sexual health and incorporates this much needed education into the lives of young adult Black women using a form of media with which they are already familiar and use often. It also has the potential to reach disenfranchised women and those with limited access to health care.

CHAPTER 2 - REVIEW OF THE LITERATURE

Condom nonuse is a serious public health issue in the U.S. The rate of negative sexual health outcomes associated with high-risk sexual behavior (HRSB) is especially devastating in the Black community. Understanding of the reasons for HRSB is necessary in order to create interventions that may help to decrease this behavior and its negative health outcomes.

Acknowledgement of the individual, social, and environmental determinants of HRSB is important for women's health researchers, practitioners, and educators alike. This chapter provides an overview of the health disparities associated with HRSB among young adult Black women and the factors leading to this behavior. HRSB interventions using traditional face-to-face and mobile phone delivery are also identified. Finally, a discussion of intervention adaptation is presented.

Sexual Health Disparities Among Young Adult Black Women

While there are approximately 2.3 million non-institutionalized young adult Black women in the U.S. (Census Bureau, 2012a), these women account for only 0.7% of the entire U.S. population. Still, the women in this age/ethnic group have the highest rates of sexually transmitted diseases (STDs) and unintentional pregnancy among all sexually active girls and women in the nation (CDC, 2015b; 2015c; Mosher, Jones, & Abma, 2012). When comparing the number of young adult Black women in the general U.S. population with the number of young adult Black women diagnosed with STDs and unplanned pregnancy, the sexual health disparity is evident.

Health disparities “adversely affect groups of people who have systematically experienced greater social and/or economic obstacles to health and/or a clean environment based on... characteristics historically linked to discrimination or exclusion” (National Partnership for

Action to End Health Disparities, 2011). Anytime there is a difference in health outcomes, which can be attributed to differences among populations, a health disparity is present (Office of Disease Prevention and Health Promotion, 2016). Consistent with these definitions, the negative sexual outcomes of STDs and unintentional pregnancy constitute health disparities among young adult Black women.

Vulnerable populations are demographic groups identified to be at highest risk for health disparities. The Office of Minority Health and Health Equity (2014) identifies and groups vulnerable populations by demographic characteristics. Young adult Black women's age, ethnicity, and gender render them a population that is triply vulnerable to health disparities, including STDs and unintentional pregnancy.

Negative Health Outcomes of HRSB

Sexually Transmitted Diseases. Except in instances of congenital STDs and rare transmissions via blood transfusion, STDs are contracted as a result of sexual intercourse. The risk of contracting an STD is increased in young women who are less than 25 years old (Workowski & Berman, 2010). Women with multiple sex partners and those utilizing illicit drugs also have higher rates of STDs than their peers. Furthermore, prior STDs history, residence in areas with high STD rates, or engaging in a sexual relationship with an STD positive partner are also associated with increased STD rates among women (Workowski & Berman, 2010).

According to the CDC (2015c), there are three reportable STDs in the U.S. for which programs receive federal funding: chlamydia, gonorrhea, and syphilis. Each of these conditions is effectively treated with short courses of antibiotics. Untreated occurrences of chlamydia and gonorrhea can cause pelvic inflammatory disease, which may lead to chronic pelvic pain, ectopic

pregnancy, and infertility. Untreated syphilis can lead to perinatal death, fetal infection, and increased transmission of HIV (CDC, 2015c).

An additional STD that is reportable yet is often placed in its own category and not grouped with other STDs, is the Human Immunodeficiency Virus (HIV). While not contracted as frequently as chlamydia, gonorrhea, or syphilis, there is no cure for HIV. Moreover, the symptoms associated with HIV are more detrimental than those of other STDs.

The only fully reliable methods of STD prevention are abstinence and engaging in a long-term, monogamous sexual relationship with a partner who has tested negative for STDs (Workowski & Berman, 2010). Another somewhat reliable, a somewhat effective method is the consistent and correct use of male condoms. When used regularly and properly, these barrier methods of prevention are 98% effective against all STDs (Workowski & Berman, 2010).

Workowski and Berman (2010) found that other barrier methods of contraception are not as effective as male condoms. Female condoms, for instance, are effective against STDs when used during vaginal intercourse, but their efficacy during anal and oral intercourse is unknown. Cervical diaphragms have been shown to be effective against chlamydia and gonorrhea, but not against syphilis or HIV (Workowski & Berman, 2010).

The authors also reported that non-barrier methods of STD prevention, like topical antiretroviral agents, are somewhat effective in decreasing the rate of HIV acquisition, but do not protect against other STDs (Workowski & Berman, 2010). With all of the various methods of STD prevention and varying efficacy of these methods, male condoms should be the most commonly recommended form of STD prevention for sexually active men and women.

Unintentional Pregnancy. Pregnancy is negatively correlated with the use of contraception. With consistent and proper use of contraception, the risk of unintentional

pregnancy among sexually active women can be close to that of abstinent women. Non-barrier methods of contraception (i.e. oral contraceptive pills, intrauterine devices, contraceptive rings, and the rhythm or withdrawal method) moderate HRSB-associated pregnancy risks. Hence, pregnancy is only an outcome of HRSB when contraception is not used or is misused. Because pregnancy is not always associated with HRSB, it is not a focus of this study.

Assumptions Related to Sexual Health Disparities

Sexual health disparities among young adult Black women have many causes and cannot be attributed only to patterns of behavior (Hogben & Leichter, 2008; Newman & Berman, 2008). While the evidence supporting STD disparities among young adult Black women is clear, the sexual behaviors of these women are not vastly different from that of young adult White women. Chandra et al. (2011) found no disparities among the number of Black and White women who had one lifetime sexual partner (12.3% vs. 19.2%), two lifetime sexual partners (8.3% vs. 9.7%), or seven to 14 lifetime sexual partners (16.7% vs. 18.9%). When comparing the number of lifetime sexual partners, the percentage of White women was consistently higher than the percentage of Black women. Only when assessing those with three to six lifetime partners was the number of Black women higher than that of White women, 40.9% vs. 31.4% (Chandra et al., 2011). Thus, it is a far-reaching assumption to conclude that sexual health disparities among Black young adult women are associated solely with their perceived promiscuity.

Based on their high rate of STDs, it can be implied that Black women have a higher rate of condom nonuse than their peers. However, Daniels et al. (2013) documented that sexually experienced Black women have a higher rate of ever using condoms (95.7%), compared with foreign born Hispanic women (74.9%), Asian women (88.3%) and U.S. born Hispanic women (89.3%). Furthermore, Kiene, Armeli, and Tennen (2008) found that 39% of sexually active

college-age women reported always using condoms, 39% reported inconsistent use of condoms, and 22% reported no condom use in the past 30 days. This is consistent with the 62.6% of Black young adult men and women who reported inconsistent condom use in another study (Kogan et al., 2010).

It is clear that Black women are not having sexual intercourse with a considerably higher number of partners than other women. Moreover, Black women are not engaging in HRSB at notably higher rates than other women. Yet, the STD rates of Black women are consistently higher than other women. So, while identifying the existence of sexual health disparities among young Black adult women is important, it is just as important to understand the reasons for these disparities.

Factors Influencing Sexual Health Disparities

According to Beltran et al. (2011), there are five determinants that typically cause health disparities: biology and genetics, individual behavior, social environment, physical environment, and health services. One or more of these determinants is present whenever a health disparity is noted. As previously mentioned, the sexual behaviors of young adult Black women do not significantly differ from those of their peers; neither do young adult Black women have a biological predisposition to contracting STDs. The major determinants affecting the rate of STDs among young adult Black women include social environments, health services, and theoretical constructs of condom use.

Social environment. Hogben and Leichter (2008) write that social health determinants of STDs include racial segregation related to place of residence, access to and utilization of healthcare, socioeconomic status, and incarceration rates. According to these authors, Blacks tend to live around other Blacks. As the rate of STDs is higher among Blacks than among other

ethnicities, living in Black communities increases the likelihood of having sexual partners in close proximity who may be infected with an STD (Hogben & Leichter, 2008). They also note that socioeconomic status is often tied to healthcare access and utilization. The poor socioeconomic status of Blacks leads to untreated STDs and the subsequent spread of these infections.

An additional cause of the sexual health disparities among young adult Black women may be related to the lack of available young adult Black men to serve as suitable sexual partners. The high rate of incarceration among Blacks has been noted by several authors as one of the social determinants of STDs within this ethnic group (Chesson et al., 2012; Swartzendruber et al., 2012; Thomas, 2006; Thomas et al., 2010; Valentine, 2008). High homicide rates may be another factor contributing to the lack of available young adult Black men. Heron (2013) reported that homicide is the eighth leading cause of death among Black men. Homicide among Black men (2.7% of all deaths among Black men) is more than 6.5 times higher than that of Whites (0.4%), 4.5 times higher than Asian/Pacific Islanders (0.6%), and 1.5 times higher than American Indian/Alaskan Natives (1.7%). So, non-Black women who want sexual partners of the same ethnicity have a larger pool from which to draw than do Black women.

As the number of available young adult Black men decreases, related to incarceration and death rates, the ratio of Black men to women favors heterosexual Black men. As such, young adult Black women are more likely than non-Black women to be in relationships with men who maintain concurrent relationships with other women (Waldrop-Valverde et al., 2013). Relationship concurrency is the phenomenon wherein one partner begins a new sexual relationship while still maintaining a previous sexual relationship. According to Epstein and

Morris (2011), risk of STD transmission is directly related to the length of sexual concurrency. Moreover, engaging in concurrent sexual relationships is more risky than engaging in an equal number of sequential monogamous sexual relationships. The high rates of STDs among young adult Black men and women coupled with the desire for same-ethnicity, heterosexual relationships, despite the lack of suitable Black men, provides an optimal situation for incessant transmission of STDs.

Health services. While the rates of STDs among young adult Black women is consistently high and the disparities between Black and non-Black women is well documented, the actual rates of STDs may differ from those being reported. For instance, incompleteness of reporting is one factor in possible underreporting of STD data (Beltran et al., 2011; CDC, 2015c). If there is missing information related to the ethnicity of the women diagnosed with STDs, the STD cases reported for that ethnic group maybe less than the actual number of women who received a diagnosis. As a result of missing information from some areas of the country, STD reporting is not yet at 100% in every region. Completeness of reported data would help researchers to better understand the true nature of STD disparities.

Underreporting of STDs may also be related to underutilization of healthcare resources. Those who are never seen by a healthcare provider, for example, may be unaware that they have contracted an STD. Without proper diagnosis, the STD infection cannot be reported. In this sense, underreporting of STD rates may be associated with lack of insurance or means to pay for healthcare. It may also be associated with lack of transportation to healthcare facilities or the inability to leave work or school for an appointment (Tilson et al., 2004).

Even when costs and transportation are not an issue, young adult Black women may still refrain from seeking care. They may not want to be seen while entering or leaving a healthcare

facility. They may also be concerned with the risk of notification of their parents or significant other. These and other concerns related to privacy and confidentiality may be an additional cause of underreporting of STDs among Black young adult women.

Each of the aforementioned factors that may influence STD rates and reporting are rooted in the decisions of young adult Black women. If providers are not biased in their screening and reporting practices, and are in compliance with the recommendation of providing treatment for both partners (or multiple partners) following the diagnosis of an STD, the rising rates of STDs among young adult Black women can be tied to patient-related factors and behaviors alone. However, just as there may be underreporting of STDs related to patient factors, there may also be discrepancies in reporting related to provider factors.

Data collection bias can increase reports of STDs among certain ethnic groups. This can ultimately influence STD rates and the perception of sexual health disparities. Studies show that STD screening and reporting is more likely among providers utilizing Title X and other government funding for women of low socioeconomic status, compared with their colleagues (Carter et al., 2011; Chow et al., 2012; Farr et al., 2009). Consequently, their patients may appear to have higher rates of STDs than others who may have never been screened for these conditions. In order to have accurate reporting of STDs both patient barriers to care and provider-related biases should be addressed.

Dual Contraception. Use of contraception other than condoms and lack of dual contraception/dual protection may also serve as a barrier to condom use among young adult women. Dual contraception is most commonly defined by the simultaneous use of an effective non-barrier contraceptive and condoms (Eisenberg, Allsworth, Zhao, & Peipert, 2012; Pazol, Kramer, & Hogue, 2010; Peipert et al., 2011). Similarly, dual protection is the use of

contraception to protect against both pregnancy and STDs (Murray et al., 2013). Based on information provided by the National Survey of Family Growth, 52.3% of U.S. women, age 15-44, use non-barrier methods of contraception; yet only 10.7% of women use dual contraception (Daniels et al., 2015).

Peipert et al. (2011) found that 77% of women who initiated dual contraception did not use this method consistently. Furthermore, dual contraception use was not sustained over 24 months, regardless of the level of consistent use at the beginning of the study. Likewise, another descriptive study found that 48.5% of 14 to 20-year-old Black adolescent and young adult contraceptive users did not use dual contraception (Sales et al., 2010). Among the study participants, factors associated with lack of dual contraception included impulsivity, recent history of marijuana or alcohol use, fear of partner, and fear of condom negotiation.

Additionally, Murray et al. (2013) found that for many 15 to 24-year-old young adult Black women dual protection was not feasible. Only 31% of these young women (39.1% of 15 to 18-year-olds and 25% of 19 to 24-year-olds) admitted to using dual protection during their most recent sexual encounter. The authors documented the lack of dual protection as being associated with social norms, parental support, length of relationship, and pregnancy history.

Although the number of sexually experienced women who have ever used condoms has grown in the past 30 years (Daniels et al., 2013), regular use of condoms during every sexual encounter is the best way to prevent the spread of STDs. Thus, it is important for researchers, practitioners, and educators to continue working to increase the use of condoms among those who are sexually active. The continued implementation of effective HRSB interventions and the creation of similar interventions should be a priority for sexual health researchers and women's health practitioners.

Summary. The environmental, healthcare, and contraception-based influences on sexual health disparities are numerous. These and other factors must be identified and understood in order to close the gap of negative sexual health outcomes between Black women and their peers. Only then can sexual health researchers, practitioners, and educators design interventions that address the needs of young adult Black women. Such interventions are important to help diminish sexual health disparities.

Behavior-Change Interventions

Based on the prevalence of STDs and unintentional pregnancy, condom nonuse is a behavior in definite need of change. While it may seem that the threat of negative health outcomes alone are enough motivation for a woman to stop engaging in HRSB, behavior change is often difficult for one to achieve on their own (Watson & Tharp, 2007). Thus, healthcare professionals often use behavior change interventions in order to encourage behavior change or modification among populations at highest risk for negative health outcomes. These interventions, however, should not be created on the whim of sexual health researchers and health educators.

Successful behavior change interventions include several key factors: clearly defined target population, goals, and objectives; sound behavioral or social science theoretical frameworks; a focus on the reduction of specific risk factors; and inclusion of skill-building activities (CDC, 1999). In their meta-analysis of 37 individual and group-level HRSB interventions for Black women, Crepaz et al. (2009) found that the majority of these interventions included female facilitators ($n = 26$), Black facilitators ($n = 23$), materials specific to Blacks ($n = 23$), and materials specific to women ($n = 20$). These data are consistent with the recommendation by Alleyne and Gaston (2010) that behavior change interventions should be

gender-specific and culturally competent. Additionally, interventions should address not only the behavior to be changed, but also the social and cultural conditions underlying the causes of the behavior (CDC, 2014; Melnyk & Morrison-Beedy, 2012). For this reason, HRSB interventions aimed at behavior change among young adult Black women should be created specifically for this population.

Historically, HRSB interventions were implemented during multiple sessions. In a landmark study of 29 single-session HRSB interventions implemented among 52,465 participants of varying ages, genders, and ethnicities, ($M = 29.5$ years, women = 37%, African-American = 29%), Eaton et al. (2012) discovered that single-session interventions can be just as efficacious as multiple-session interventions. The most effective interventions were those that were implemented among Black participants, that were of longer duration, and that were conducted face-to-face. Several interventions are presented throughout the remainder of this section. While many of the interventions support the findings of Eaton et al. (2012), other interventions of short duration and those using technologically advanced methods of delivery are shown to be more efficacious than those of longer duration or those delivered using traditional face-to-face methods.

Traditional HRSB Interventions

There are many different behavioral interventions aimed at decreasing HRSB among young adult Black women. While these interventions are numerous, few meet the rigorous evidence-based intervention standards established by the CDC's HIV/AIDS Prevention Research Synthesis Project (PRS). PRS was established in 1996 to identify HRSB interventions for inclusion in the *Compendium of HIV Prevention Interventions with Evidence of Effectiveness* (CDC, 1999), now known as the *Compendium of HIV Behavioral Interventions* (CDC, 2015a).

The criteria set by PRS includes standards for best-evidence and good-evidence risk reduction interventions at the community, group, and individual levels (CDC, 2014; Lyles, Crepaz, Herbst, & Kay, 2006; Lyles et al., 2007). These standards are based on the strength of the research study design and study results. Best-evidence interventions include those that utilize prospective study designs, compare results of intervention and control groups, use minimally biased sampling procedures, maintain a retention rate of 70% or more at each data collection point, and conduct follow-up assessments no less than three months after the completion of the intervention. Conversely, good-evidence interventions include those which utilize quasi-experimental designs and moderately biased sampling procedures, maintain a 60% retention rate, and conduct follow-up assessments no less than one month following the completion of the intervention. Both best-evidence and good-evidence interventions contain statistically significant results ($p \leq .05$) which show positive change in at least one HIV/STD risk behavior (CDC, 2015a).

The *Compendium* includes 93 evidence-based behavioral risk reduction interventions, 56 of which are best-evidence interventions (CDC, 2015a). There are 14 HRSB interventions (15.1% of all *Compendium* interventions) in which all study participants were women and at least 50% were Black. There are four additional interventions (4.3%), in which all study participants were Black and 50% or more were female. In keeping with the recommendation that HRSB interventions reflect gender-specific and culturally competent curriculum, only those interventions reporting a study sample of 100% Black women are discussed in this section ($n = 5$ interventions, 5.4%). Each of these U.S.-based studies is identified as a best-evidence intervention.

Female and Culturally Specific Negotiation. Female and Culturally Specific

Negotiation is a multiple-session, individual-level HRSB intervention (CDC, 2015a). Each participant attends four 20 to 40-minute sessions over three to four weeks. The sessions focus on HIV risk reduction strategies including skill-building, assertiveness, negotiation, and conflict resolution (Sterk, Theall, & Elifson, 2003; Sterk, Theall, Elifson, & Kidder, 2003). A female facilitator conducts each session using delivery methods such as counseling, development of an individualized plan, and role-play (CDC, 2015a).

Sterk, Theall, Elifson, et al. (2003) studied the intervention among drug-using women randomized to an enhanced negotiation group ($n = 21$, $M = 41.7$ years), enhanced motivation group ($n = 20$, $M = 41.5$ years), or standard intervention group ($n = 27$, $M = 39.9$ years). The women in the enhanced motivation group received four individual sessions focusing on motivation and readiness to change HIV risk behaviors. The women in the standard intervention group received the two-session National Institute on Drug Abuse standard intervention, which focuses on HIV knowledge and risk behaviors (Sterk, Theall, Elifson, et al., 2003).

Participants in the enhanced negotiation group were less likely to use alcohol during sex ($p < .001$), have vaginal sex with a paying partner ($p < .05$), or have sex for money ($p < .05$) at six months post-intervention, compared to participants in the standard intervention group (Sterk, Theall, Elifson, et al., 2003). An additional study by Sterk, Theall, and Elifson (2003) showed that participants in the enhanced negotiation group ($n = 78$) had a greater reduction of vaginal, oral, or anal sex with paying partners at six months post-intervention, compared to the women in the enhanced motivation group ($n = 73$, $p < .001$) and the standard intervention group ($n = 114$, $p < .01$). The enhanced negotiation group also reported increased condom use with a steady partner

at six months post-intervention, as compared to the standard intervention participants, $p < .01$ (Sterk, Theall, & Elifson, 2003; Sterk, Theall, Elifson, et al., 2003).

HORIZONS. HORIZONS is a multiple-session, group-level HRSB intervention (CDC, 2015a). On two consecutive Saturdays, an African American female health educator facilitates one four-hour session among an average of eight participants. The content of the group sessions includes cultural and gender pride and STD risk information. Content delivery includes discussion, printed material, and role-play. Each participant receives an STD screening/treatment voucher to give to her partner. To reinforce learning, participants also receive a 15-minute phone call every two-and-a-half months for up to nine months (CDC, 2015a).

DiClemente et al. (2009) studied the effects of HORIZONS among 715 adolescent girls randomized to the intervention group ($n = 348$, $M = 17.79$ years) or the enhanced standard of care group ($n = 367$, $M = 17.78$ years). The participants in the enhanced standard of care group received a one-hour group session focusing on STD prevention. Like the intervention group, they also received 15-minute phone call every two-and-a-half months for up to nine months. However, their call did not include any discussion of STD prevention. They were only asked about their current contact information (DiClemente et al., 2009).

Participants in the intervention group were less likely to have a chlamydia infection, compared to the participants in the standard of care group ($p = .04$) at 12 months post-intervention (DiClemente et al., 2009). Among study participants who had chlamydia infections at six months post-intervention, those in the intervention group had less recurrent chlamydia infections at 12 months post-intervention than those in the standard of care group ($p = .02$). Sexual partners of the intervention group participants were also more likely to be treated for STDs than the partners of the standard of care group participants ($p = .03$). Additionally,

intervention participants reported fewer episodes of unprotected sex in the 14 days ($p = .004$) and 60 days ($p < .001$) prior to follow-up assessments, compared to the standard of care group.

Lastly, across all data collection points, there was a higher frequency of partner communication ($p = .04$), condom use self-efficacy ($p < .001$), and STD prevention knowledge ($p < .001$) among intervention participants, compared the standard of care participants (DiClemente et al., 2009).

Sister to Sister. The purpose of Sister to Sister is to reduce risky sexual behaviors and prevent STDs (CDC, 2015a). It is a single-session, group-level and individual-level HRSB intervention. The intervention is implemented among three to five women during a 200-minute session or with one woman in a 20-minute session. The curriculum includes HIV/STD information and behavioral skill-building. An African American female nurse facilitates the intervention using methods such as demonstration, discussion, role-play, and videos (CDC, 2015a).

Jemmott et al. (2007) randomized 564 participants to the group skill intervention ($n = 118$, $M = 27$ years), one-on-one skill intervention ($n = 123$, $M = 27$ years), group information intervention ($n = 124$, $M = 27.3$ years), one-on-one information intervention ($n = 118$, $M = 27.3$ years), or group health intervention ($n = 81$, $M = 27.3$ years). Both of the skill intervention groups received Sister to Sister as their curriculum. The information intervention groups learned about STD vulnerability, transmission, and prevention. The health intervention group learned about diet, exercise, and alcohol and tobacco use (Jemmott et al., 2007).

At three months post-intervention, participants in the skill intervention groups had higher reports of condom use during last sex than participants the health intervention group, $d = .18$, $p = .05$ (Jemmott et al., 2007). This finding was sustained at 12 months, when comparing the skill intervention groups to the information intervention groups ($d = .23$, $p = 0.14$) and health

intervention group ($d = .20, p = .034$). Skill intervention participants also reported less unprotected sex at three months than information intervention participants ($d = .25, p = .012$) and health intervention participants ($d = .23, p = .019$). This finding was sustained at 12 months, among skill intervention participants and information intervention participants ($d = .23, p = .024$). Lastly, skill intervention participants had less STD positive tests at 12 months than health intervention participants ($d = .20, p = .032$). The results of the skill intervention groups showed a small effect size ($d = .32$) when compared to the results of the group health intervention (Jemmott et al., 2007).

In another article reporting findings of the Sister to Sister intervention, O'Leary, Jemmott, and Jemmott (2008) assessed the effect of the intervention on social cognitive theory mediators. This secondary analysis combines participants from the group and one-on-one skill intervention participants ($n = 185$), as well as the group and one-on-one information intervention ($n = 191$). Results showed that the skill intervention participants had higher partner reaction outcome expectancies ($p = .05$), self-efficacy for carrying condoms ($p = .05$), and self-efficacy for using condoms ($p = .05$) than the health promotion intervention participants at 12-months post-intervention. Self-efficacy to use condoms was the only mediator to have a significant association with intervention effects, $p < .001$ (O'Leary et al., 2008).

Sistering, Informing, Healing, Living, and Empowering (SiHLE). Created by the same researchers who created HORIZONS, SiHLE is a multiple-session, group-level intervention (CDC, 2015a). One African American female health educator and two African American female peer educators conduct this intervention during four, 4-hour group sessions on consecutive Saturdays. An average of 10 to 12 participants attend each session. The facilitators

use demonstration, group discussion, lectures, and role-play to teach information related to ethnic and gender pride and HIV prevention (CDC, 2015a).

In a study by DiClemente et al. (2004), 522 adolescent girls were randomized to the SiHLE intervention group ($n = 251$, $M = 15.99$ years) or a general health promotion group ($n = 271$, $M = 15.97$ years). The health promotion group received four, 4-hour group sessions that focused on nutrition and exercise (DiClemente et al., 2004).

Participants in the intervention group reported more consistent condom use in the past six months ($p = .001$) and during last sex ($p < .001$), higher percentage of condom use in last 30 days ($p < .001$) and last six months ($p < .001$), increased frequency of partner condom application ($p < .001$), more HIV knowledge ($p < .001$), more positive condom attitudes ($p < .001$), less condom barriers ($p = .003$), and greater condom use self-efficacy ($p < .001$) at six months post-intervention, compared to the participants in the health promotion group. At 12 months, significant positive outcomes were similarly reported for condom use behaviors and related outcomes among intervention group participants, compared health promotion group participants (DiClemente et al., 2004).

Women's Co-Op. The final *Compendium* intervention for Black women is a multiple-session, group-level intervention (CDC, 2015a). Participants attend two, 30 to 40-minute individual sessions, which occur on the same day, and two 60 to 90-minute group sessions, which occur every two weeks following completion of the individual sessions (Wechsberg, Lam, Zule, & Bobashev, 2004). Individual sessions focus on pre- and posttest counseling. Group sessions focus on risk reduction skills, development of support networks, and linkage to social services. An African American woman who lives in the community facilitates the sessions using counseling, goal-setting, and printed materials (CDC, 2015c).

Wechsberg et al. (2004) randomized study participants ($M = 36.7$ years) to the women-focused (i.e. Women's Co-Op) intervention group ($n = 213$), standard intervention group ($n = 199$), or delayed-intervention control group ($n = 207$). The women in the standard intervention group received two individual sessions identical to those received by the women-focused intervention group. They also received the NIDA standard HV prevention intervention during two group sessions. The women in the delayed-intervention group were offered the two-session NIDA intervention following the six-month data collection period (Wechsberg et al., 2004).

At three month post-randomization, participants in the women-focused group reported less trading sex (i.e. for food, shelter, clothes, or drugs) in the past 30 days, compared to the women in the delayed-intervention control group, $p = .03$ (Wechsberg et al., 2004). At six-months post-randomization, participants in the women-focused intervention group also reported less unprotected sex in the past 30 days, compared to the women in the delayed-intervention control group, $p = .046$ (Wechsberg et al., 2004).

Summary. A comparison of the five *Compendium* interventions studied solely among Black women reveals that intervention designs of varying numbers of sessions, session lengths, and overall program durations can be effective in decreasing HRSB among Black women.

Moving from Traditional to mHealth Interventions

Although used in various settings, among women with differing demographics, the *Compendium* (CDC, 2015a) interventions for use among Black women can only be implemented when the facilitator and the participant are face-to-face. Consequently, the positive outcomes associated with these interventions are only noted among Black women who present at a healthcare clinic or other location at which the intervention is implemented. Currently, there are no technology-based interventions included in the *Compendium* (CDC, 2015a) in which the

majority of study participants were Black women. However, with the ever-increasing use of mobile health technology (mHealth) and the success of mHealth studies (discussed later in this section), no best-evidence intervention should be confined by face-to-face limitations.

New learning styles are needed for young adults because they are so different from the generations that came before them (Rosen, 2009). Today's young adults are the first generation born into an era in which internet and mobile technologies have been a major part of their lives since birth (Palfrey & Gasser, 2008). The generational labels used to describe today's young adults evidence this unique tie to technology. For instance, in addition to being called *Millennials* (Taylor & Keeter, 2010), scholars refer to those born after 1980 as *Digital Natives* (Palfrey & Gasser, 2008) and those born between 1990-2009 as the *iGeneration* (Rosen, 2009). As they have grown up with social media like Facebook and Twitter, this generation is extremely comfortable using technology and often prefers its use over other methods of learning and social engagement (Rosen, 2009). Young adults agree that their use of technology makes their generation distinctly unique from their predecessors (Taylor & Keeter, 2010).

In an effort to maintain the interest of those most at risk for negative sexual health outcomes, health promotion and disease prevention interventions should be implemented using modes of delivery with which the intended audience is most comfortable. In the case of young adults, this mode of delivery includes heavy use of technology. Rosen (2009) suggests use of mobile virtual learning environments and text messages as methods of instructional technology for the *iGeneration*. In the same manner as Rosen (2009), the CDC (2010, 2011b) encourages health educators to use mHealth, including social media sites, mobile applications, and text messaging, to reach their target populations.

Mobile Usage by Young Adults. Understanding the ways in which various populations use mobile devices can help researchers, educators, and providers to choose the most appropriate platform for the delivery of an mHealth intervention. According to the Pew Internet and American Life Project, 98% of young adults, age 18 to 29, own a mobile phone (Pew Research Center, 2016). The incidence of mobile phone ownership is higher among this group than any other demographic group.

Mobile phones can be used to do many things, including making phone call, browsing the internet, using mobile applications, and taking pictures. Of the various ways in which mobile phones are used, text messaging is the most frequent type of mobile phone usage among 18 to 29-year-old young adults (Duggan, 2013; Smith, 2015). In a survey of 2,076 U.S adults, Pew identifies 18 to 29-year-olds ($n= 395$), as having higher text messaging rates than all other age groups, 97% vs. 81% (Duggan, 2013). In an additional survey, 100% of young adults smartphone owners, age 18 to 29 ($n = 202$), reported the use of text-messaging (Smith, 2015). This number is higher than the 86% of 18 to 24-year-old young adults who previously reported engaging in text messaging (Experian Marketing Services, 2013) survey.

Young adults, age 18 to 24, send and received an average of 3,853 text messages monthly (Experian Marketing Services, 2013). This is an increase over the 3,200 monthly text messages sent and received by 18 to 24-year-olds, as reported by Smith (2011). Furthermore, the most recent Pew mobile usage report in which survey participants were stratified by age, ethnicity, and gender, shows that the highest rates of texting is among 18 to 29-year-olds, Blacks, and women (Smith, 2011).

In addition to its high rate of use by young adults, text messaging is the most simple method of mHealth delivery (CDC, 2011b). As the use of text messaging continues to grow,

especially among those at greatest risk for STDs and unplanned pregnancy, it is important for researchers to consider this mode of learning as a potentially effective method of HRSB intervention delivery.

What is Text Messaging? Text messaging technology is an outgrowth of teleservice technology. This technology mediates message transmission to ships and planes, telemetry monitoring, and facsimile machines (Trosby, Holley, Harris, & Hillebrand, 2010). There is inconclusive evidence of the exact timing of the first text message. Some believe the first text message was sent in December 1992 in the UK, while others believe the first text message was sent in Finland at some time prior to this. What is known, however, is that the concept of text messaging dates back to 1984 or 1985 (Trosby et al., 2010).

Today, text messaging is referred to as short message service (SMS) or multimedia messaging service (MMS), depending on the type of messages sent and received. SMS can be used to send and receive alphanumeric messages of 160-characters or less. Special characters and emoticons or emojis—small pictures incorporated into sentences to portray common nouns, verbs, and emotions—may also be sent via SMS (Verizon Wireless, 2016b). MMS, on the other hand, allows mobile phone owners to send and receive messages containing pictures, videos, and audio recordings (CDC, 2011b; T-Mobile USA Inc., 2014). MMS is also used to send text messages that are longer than 160-characters. Both SMS and MMS can be sent to individuals or groups using the recipients' mobile phone numbers or email addresses. Furthermore, SMS and MMS do not have to be sent from mobile phones; any device that can connect to the internet can be used to send text messages (Verizon Wireless, 2016b). However, the messages can only be received if the recipient's mobile phone is connected to mobile phone tower.

Costs associated with SMS and MMS in the U.S. are minimal. Text messaging plans can be purchased in one of three categories: pay per message, monthly message allowance, or unlimited monthly messages. Unlimited messaging plans are the most expensive of the messaging plans, but they are also the most widely used. Each of the most popular U.S. mobile phone service providers offers an unlimited talk and text plan for under \$50 per month (AT&T, 2016; Sprint, 2016; T-Mobile USA Inc., 2016; Verizon Wireless, 2016c). Verizon Wireless (2016a) also offers a text-only plan, which provides unlimited messaging, yet does not require concurrent subscription to a traditional cellular voice-calling plan.

Using Text Messages to Encourage Health-Related Behavior Change. Text messaging is a vital tool for the delivery of health information. It can be used to encourage improvement in their overall health, among those who frequently engage in text messaging to (CDC, 2011b). Aside from the presumed acceptability of HRSB text message interventions by young adult Black women, these types of interventions can also address many of the barriers that prevent this population from utilizing healthcare or receiving traditional face-to-face sexual health interventions.

According to Bull (2011), barriers including lack of healthcare, transportation issues, and income do not have the same impact on participants in a text message intervention as they may have on participants of a traditional face-to-face intervention. Furthermore, the costs associated with text message interventions have the potential to be far less expensive than traditional interventions. Lastly, there is also no potential issue with facilitator training, participant absence, or threats to the fidelity of the intervention (Bull, 2011).

The CDC (2011b) provides several text messaging best practices for those creating new text messaging interventions. First, text messages should always be short and concise, yet

engaging. Second, message content should be kept to an eighth grade reading level or below. Third, although abbreviations are sometimes used to maintain the short nature of text messages, abbreviations and acronyms should be used sparingly in text message interventions. Furthermore, text messages should allow recipients to access additional information and links to this information should be included in the content of the message. Lastly, message recipients should be given the option to stop receiving messages if they so desire. In this sense, message content should include opt-out instructions (CDC, 2011b). The best practices recommended by the CDC are guidelines for the creation of effective, engaging text messages. Message developers are encouraged to follow these guidelines as necessary.

Text Message Interventions

Text message interventions have been shown to mediate significant changes related to chronic disease management (Cole-Lewis & Kershaw, 2010; de Jongh, Gurol-Urganci, Vodopivec-Jamsek, Car, & Atun, 2012; Holtz & Lauckner, 2012), exercise and physical activity (Buchholz, Wilbur, Ingram, & Fogg, 2013; Prestwich, Perugini, & Hurling, 2009, 2010; Stephens & Allen, 2013), and smoking cessation (Haug, Meyer, Dymalski, Lippke, & John, 2012; Haug, Meyer, Schorr, Bauer, & John, 2009; Whittaker et al., 2011). They have also been utilized to address issues with healthcare appointment attendance (Car, Gurol-Urganci, de Jongh, Vodopivec-Jamsek, & Atun, 2012) and medication adherence (Castaño, Bynum, Andrés, Lara, & Westhoff, 2012; Hou, Hurwitz, Kavanagh, Fortin, & Goldberg, 2010; Menon-Johansson, McNaught, Mandalia, & Sullivan, 2006; Person, Blain, Jiang, Rasmussen, & Stout, 2011). Among HRSB text message interventions, specifically, delivery of information via text messaging may mitigate the social stigma associated with traditional group interventions (Broaddus, Marsch, & Fisher, 2015).

Intervention delivery. Text messages offer many components that can be implemented in SMS or MMS interventions. For instance, some interventions utilized one-way text messages, allowing participants to receive an automated message to which they cannot respond. Other interventions used two-way text messages, which allowed message recipients to send a preselected or individualized reply to the message sender. When using a text-messaging platform that requires payment for all messages sent or received, one-way text message interventions are less costly to run than two-way message intervention. Furthermore, because there is no need to create automated responses to incoming messages, one-way text message interventions should generally take less time to design, compared with two-way message intervention. The use of two-way messages may also require additional personnel if participants expect real-time responses. So again, one-way text message interventions may be less costly than two-way interventions because of the use of fewer personnel.

Text messages interventions can be send as frequently as multiple times per day or as infrequently as once every few months. However, it is the number of text messages and not the frequency of these messages that may potentially increase intervention design time and costs. Text messages can also be tailored to participants' individual demographics and needs or they can be generic messages that are targeted to all participants. Tailored messages use a more complicated message design and require the creation of more messages than targeted messages. However, participants in a tailored text message intervention may appreciate that the messages are more individualized than the generic messages received by participants in a targeted text message intervention.

Issues with message development and implementation, can affect the efficacy of a text message intervention. To create an effective text message intervention, a clear understanding of

the design and identification of efficacious characteristics of current text message interventions is necessary. Lessons and best practices should be learned from such text message interventions.

In a meta-analysis of 19 health-related text message interventions, Head, Noar, Iannarino, and Grant Harrington (2013) compared the efficacy of various intervention designs. The mean effect size among all interventions in the meta-analysis was $d = .329$ (95% CI = .274, .385; $p < .001$). Thus, statistically significant effects of the text-messaging interventions were noted. This is an important finding, which combats the findings of authors like Stephens and Allen (2013) who write that stand-alone text message interventions have no evidence of effectiveness.

Head et al. (2013) found text-only interventions to be as effective as interventions using text messages in combination with other, more traditional intervention components ($QB = .12$, $df = 1$, $p = .73$). As such, text message interventions do not have to be used only as boosters for traditional interventions. They can be used as stand-alone interventions to bring about behavior change. Furthermore, there was no significant difference in the effectiveness of one-way and two-way text message interventions (Head et al., 2013). So, although some participants may prefer two-way communication, interventionists do not have to feel burden with the creation of responses message or employ someone to respond to messages just to increase the efficacy of a text message intervention.

In terms of components that increased intervention efficacy, there was a significant difference noted between interventions that utilize message tailoring, compared with those that utilize message targeting, $QB = 21.66$, $df = 2$, $p = .001$ (Head et al., 2013). The authors found that interventions using only message tailoring had smaller effect sizes ($d = .274$) than those using both message tailoring and targeting ($d = .442$). Message tailoring associated with demographic ($p = .001$) and psychosocial factors ($p = .02$), as well as personalization ($p = .001$) were noted as

more effective than messages that did not incorporate this type of tailoring. Interventions using only message targeting had the smallest effect size of all, $d = .073$ (Head et al., 2013).

The most effective text messages interventions in the Head et al. (2013) meta-analysis were those in which message frequency decreased throughout the intervention ($d = .523$) and those that allowed message recipients to select the frequency of the messages ($d = .425$). As such, text messages researchers may choose to front-load messages and taper them toward the end of the intervention, in an effort to increase efficacy. Or, they can give the participant the autonomy to decide how often messages will be sent. In this sense, the participants maintain control of their participation and do not have to surrender to an all-or-nothing mind frame.

HRSB Text Message Interventions. As the use of mHealth interventions continue to gain popularity, the rate of HRSB text message interventions is growing. A keyword search of the terms *texting* or *text message*, *condom use*, and *intervention*. was conducted in the EBSCO, PubMed, Web of Science, and Google Scholar databases. This search yielded more than 1,000 distinct articles. Search results were sorted by relevance and the first 100 full-text articles were identified for potential review. Studies that did not report original study findings related to condom use and those that implemented hybrid interventions (i.e. text messages in addition to another delivery method) were not reviewed. Potential studies were also identified from the reference lists of text message intervention review articles and meta-analyses. These studies were held to the same aforementioned inclusion criteria. A total of six studies, which include findings of five different interventions, are presented in this review of literature.

6001. A study by Jamison, Karlan, and Raffler (2013) assessed a two-way SMS intervention created for men and women in Uganda. Participants sent sexual health-related text messages to the messaging platform and received an automated response from a pool of 500

potential responses. Each response text messages was an average of 500-characters and was selected based on an algorithm to determine the subject of the incoming text message. Study participants were clustered into the intervention group ($n = 894$, 51% women, $M = 25.37$ years) or control group ($n = 897$, 50% women, $M = 25.26$ years) based on their village of residence. Residents of the intervention group villages received mass marketing for the 6001 intervention, while residents of the control group villages did not. Quantitative data was received from 1,791 participants at baseline and 2,424 participants at follow-up. Of these participants, 1,200 completed both the baseline and follow-up surveys. Qualitative data was also obtained during focus groups and one-to-one interviews (Jamison et al., 2013).

Follow-up surveys were sent one year after baseline surveys (Jamison et al., 2013). There was no change in HIV knowledge ($p = .56$), attitudes toward condoms ($p = .17$), safe sex behavior ($p = .62$), or risk perception ($p = .09$) among intervention participants between baseline and follow-up. There was, however, a change in their perception of their own risky behavior ($p < .05$). Surprisingly, intervention group participants reported more sexual partners ($p = .02$) and a higher rate of unfaithfulness at follow-up, compared to control group participants ($p < .01$). During participant interviews, it was suggested that awareness of how to protect oneself from HIV might have encouraged participants to forgo monogamy (Jamison et al., 2013). These study findings show that a two-way, automated text message intervention can be successful in increasing awareness of risky sexual behavior. However, acknowledgement of risk may not always result in positive behavior change.

Project Tech Support. Reback et al. (2012) created a two-way HRSB text messaging intervention for U.S. methamphetamine-using men who have sex with men. Each study participant ($n = 52$, $M = 36.5$ years, 21.2% Black) received one to three risk-reduction text

messages per day for two weeks. They were also encouraged to text sexual health questions to the study team. Each participant-initiated text message received a response from a study team member during predetermined times at which the study team was readily available. Participants were limited to four text conversations per day, and 40 messages per conversation (Reback et al., 2012).

Participants' sexual behaviors with their main partners did not change from baseline to follow-up (Reback et al., 2012). However, they reported fewer non-primary HIV positive sexual partners at follow-up ($p < .01$), and less bottoming ($p < .05$) and drug use ($p < .01$) during sex with these partners, as compared to their baseline reports. Participants also reported fewer non-primary HIV negative sexual partners at follow-up ($p < .05$), and less topping ($p < .01$), bottoming ($p < .05$), alcohol use ($p < .01$), and drug use ($p < .01$) during sex with these partners, as compared to their baseline reports (Reback et al., 2012). These findings show that a brief, two-way SMS intervention with real-time responses can be effective in decreasing HRSB among men who have sex with men. However, there was no control group for comparison purposes.

Safer sex texts for Australian men and women. Gold, Lim, et al. (2011) created 12 sexual health SMS messages that were sent to Australian adolescents and young adults once every three to four weeks over five months. Female participants ($n = 988$, $M = 22$ years) reported increased sexual health knowledge ($p < 0.01$), fewer casual sex partners ($p < 0.01$), and fewer new partners ($p < 0.01$) at follow-up, compared with their self-report measures at baseline (Gold, Lim, et al., 2011). Eighty percent of study participants found the text messages to be interesting or entertaining, 68% reported learning from the messages, and 73% reported showing the messages to these friends and/or partners. Additionally, 23% of text message recipients found the texts to be annoying. Study results show that infrequent text messages can help to increase

knowledge and decrease HRSB. However, no control group was available for comparison. Still, the text messages were found to be acceptable among the young adults for whom they were created.

Gold, Aitken, et al. (2011) reported the outcomes of a similar intervention in which six SMS text messages and two MMS text messages were sent to Australian adolescents and young adults over four months. Study participants were randomized to a safer sex text message group ($n = 158$, female = 39.2%, 16 – 24 years = 46.8%) or a sun safety text message group ($n = 200$, female = 40.5%, 16 – 24 years = 42%). At follow-up, participants in the safer sex group had more increased sexual health knowledge ($OR\ 1.9$, $CI\ 1.0-3.8$, $p = .06$), fewer new sexual partners ($OR\ 0.6$, $CI\ 0.4-1.0$, $p = .05$), and more consistent condom use with new sexual partners ($OR\ 2.1$, $CI\ 0.1-4.2$, $p = .03$), compared to participants in the sun safety group (Gold, Aitken, et al., 2011). Again, study results show that relatively few text messages ($n = 8$) can help to increase knowledge and decrease HRSB.

Sexual health text messages for young women recruited from the ER. Suffoletto et al. (2013) sent 12 weekly SMS messages to U.S. women ages 18 – 25. Each Sunday, intervention group participants ($n = 23$, 78% Black, $M = 22$ years) were sent a series of text messages to assess their HRSB in the past week. They were then educated on the riskiness of their sexual behavior and assisted in the creation sexual goals for the upcoming week. Participants in the control group ($n = 29$, 55% Black, $M = 21$ years) were sent one text message each Sunday to remind them to take the follow-up survey at the end of the 12-week period (Suffoletto et al., 2013).

Intervention group participants reported more consistent condom use in the past 28 days ($OR\ 1.32$, $CI\ .31, 5.71$, $p > .05$) and at last vaginal sex ($OR\ 2.12$, $CI\ .52, 8.7$, $p > .05$), compared

to control group participants (Suffoletto et al., 2013). Moreover, the intervention group participants reported the text messages as being very informative, very useful, and sent at optimal intervals (i.e. weekly). Findings of this study show that weekly text messages can help to decrease HRSB.

The 411 on Safe Text. Over a period of 12 weeks, Juzang, Fortune, Black, Wright, and Bull (2011) sent three text messages per week to adolescent and young adult Black men in the U.S. who were separated into non-randomized groups. The intervention group ($n = 30$, $M = 19$ years) received messages related to sexual health, while the control group ($n = 30$, $M = 17$ years) received messages related to nutrition. Retention of study participants was 65% (Juzang et al., 2011).

No significant changes in condom use or intentions were found from baseline to follow-up. However, awareness of sexual health increased over time among intervention group participants (Juzang et al., 2011). These findings are comparable to those of Jamison et al. (2013) which support the use of text messaging to help increase awareness of one's sexual risk.

Summary. HRSB text message studies support the utility of these interventions among at-risk populations. The significant increases in condom use with main and casual partners among text message intervention participants can be likened to that of traditional HRSB intervention participants. Reductions in HRSB were noted among text messages intervention that sent messages as frequently as several times per week, to those that sent messages as infrequently as every few weeks. These positive outcomes were also noted among text message intervention that used one-way, two-way automated, and two-way real time response messages.

As with any other types of interventions, text message interventions do not always yield the expected outcomes. Nevertheless, even those messages that did not change HRSB reported

changing risk perception. Although young adult Black women have the highest rates of STDs among all women and most men, none of the text message interventions reviewed were created specifically for use among this population. Additional research is needed to better substantiate the efficacy of HRSB text message interventions, especially those created for young adult Black women.

Intervention Adaptation

The lack of technological tools incorporated in *Compendium* intervention for Black women can cause these programs to be seen as irrelevant; however, technology should never supersede efficacy in health promotion and disease prevention programming (Bull, 2011). Instead of creating completely new interventions, some authors suggest adapting evidence-based interventions for use in new settings and among new populations (Castro et al., 2010; Chen et al., 2013; McKleroy et al., 2006; Villarruel et al., 2005; Wingood & DiClemente, 2008).

Several adaptation models exist, including Intervention Mapping (Bartholomew, Parcel, & Kok, 1998), the CDC's Map of Adaptation Process (McKleroy et al., 2006), a program adaptation model by Card, Solomon, and Cunningham (2011), and the ADAPT-ITT model (Wingood & DiClemente, 2008). Each of these models provides a systematic process that may be utilized to creating or adapting an intervention for use among a new population. Regardless of the model to be utilized, important factors should be taken into consideration when adapting an existing intervention.

Newly adapted interventions should always maintain the fidelity of the original intervention. Maintenance of fidelity occurs when the core elements and key characteristics of an intervention remain intact. Core elements are the theoretical and logical aspects of an intervention that are the most likely cause of the intervention's main outcomes (McKleroy et al.,

2006). While particulars of the elements or the method of delivery may change, the core elements should remain the same. Key characteristics are non-essential, yet important, aspects of an intervention (McKleroy et al., 2006). Unlike core elements, key characteristics may be modified, but they should not be removed from the intervention altogether.

In an effort to maintain the core elements of the original intervention and subsequently maintain its fidelity, Wingood and DiClemente (2008) suggest creating an adaptation plan. This plan should identify the aim of adaptation, the intervention to be adapted, proof of the intervention as an evidence-based model, the demographics of the new target population or a description of the adapted intervention's new context, the core elements of the original intervention, and any new activities to be added to the adapted version of the intervention, along with the aims of these activities.

Adaptation of an intervention always includes testing of pilot studies. Pilot studies are trial runs of future randomized controlled trials (RCTs), which are conducted independently of main studies (Lancaster, Dodd, & Williamson, 2004; Wingood & DiClemente, 2008). They are conducted to determine the feasibility of a new intervention (Bowen et al., 2009; Thabane et al., 2010), the efficacy of intervention adaptation (Wingood & DiClemente, 2008), the likelihood of achieving a desired impact (McKleroy et al., 2006), or the proper sample size for future RCTs (Browne, 1995). Bowen et al. (2009) writes that feasibility testing should always occur prior to efficacy testing, because the findings of the former study will determine the need for the latter study. They suggest that interventions that are not found to be feasible should be disregarded.

According to Lancaster et al. (2004) and Tickle-Degnen (2013), authentic pilot studies have research purposes, aims, and methods that are unlike those of an RCT. Researchers who desire to publish the findings of failed RCTs should not label the studies as pilot studies simply

because they were unable to recruit the anticipated number of study participants or because the study lacks the statistical power needed to show significance. The plan for a pilot study should be made prior to initiation of the study, not as an after thought.

For this adaptation study of Sister to Sister, the ADAPT-ITT model (Wingood & DiClemente, 2008) was utilized. This model was selected because of its focus on HRSB interventions, history of successful in intervention adaptation studies, and easy-to-follow design.

The ADAPT-ITT Model

The ADAPT-ITT model was developed to help researchers modify evidence-based HIV interventions for use among new populations and in new settings (Wingood & DiClemente, 2008). The model name is a mnemonic for its eight phases. Each phase is implemented sequentially in an effort to successfully adapt an intervention. During the implementation of these phases, both qualitative and quantitative research methods are utilized. This use of a mixed methods approach, along with use of topical experts and the creation of three distinct drafts of the new intervention, are key factors that make the ADAPT-ITT model uniquely different from other adaptation models (Wingood & DiClemente, 2008).

Assessment. In the first phase of the ADAPT-ITT model, intervention designers conduct elicitation research. The information gained from this research helps to determine the need for the intervention among a new population. Through one-on-one interviews or focus groups, members of the target population are asked about their risk levels, health education preferences, and need for health-related interventions. Key stakeholders and agency staff members are also interviewed to help the intervention designers understand the capacity of the agency to implement the newly adapted intervention.

Decision. In the second phase of the model evidence-based interventions are reviewed. After selecting a potential intervention, a decision is made to either adopt the intervention as is or to adapt the intervention for use among the new target population. If it is decided to adopt the intervention, the use of the ADAPT-ITT model is no longer necessary. If it is decided to adapt the intervention, however, the third phase of the model should be implemented.

Adaptation. Theater testing occurs during the third phase of the ADAPT-ITT model. This methodology includes implementation of the actual intervention among members of the new target population. While these participants participate in the intervention, the stakeholders and agency staff members observe the intervention's implementation. A questionnaire is then given to audience members and their answers are used to initiate a discussion of the appropriateness of the intervention for the new target population. Wingood and DiClemente (2008) suggest recruiting 15 representatives from the new target population and additional stakeholders and staff agency members to participate in the theater testing.

Production. The fourth phase of the model involves producing the first draft of the adapted intervention. An adaption plan should be created or reviewed in order to document adaptation considerations and decisions. During this phase, intervention designers should also determine the goal of the adaptation. This goal can be either successful adaption of the intervention among the new target population or testing of theoretically sound mediators on intervention outcomes. If the goal is to test the findings of the adapted intervention, evaluation measures must be developed.

Topical experts. In the fifth phase of the model, topical experts are as consulted by intervention designers. These experts are asked to review the intervention draft created during phase four and make suggestions for additional changes to the newly adapted intervention.

Integration. A second intervention draft is created during the sixth phase of the ADAPT-ITT model. This draft should incorporate any additions recommended by the topical experts during phase five. The draft is tested for readability using the Flesch-Kincaid Readability Test. Integrating the result of the readability testing, a third draft of the intervention is created. This final draft should contain only that content which is written at a fifth-grade reading level.

Training. In the seventh phase of the model, intervention facilitators are trained to implement the intervention. Research assistants are also trained in proper recruitment and retention, data collection, and data management methods.

Testing. The final phase of the ADAPT-ITT model involves two forms of intervention testing. First, a pilot test is conducted among 20 members of the new target population. Once the intervention ends, participants provide feedback on the relevance, usefulness, and appropriateness of the intervention. Stakeholders and agency staff members are also asked to provide feedback on their views of the successful nature of the intervention's adaptation. Data from the participants, stakeholders, and agency staff are analyzed and changes are integrated into the final version of the newly adapted intervention.

Finally, a randomized controlled trial of the adapted intervention is conducted. Study participants are randomized to either the intervention group or the control group. Pre- and post-intervention measures should be gathered in a baseline assessment and an additional assessment no less than three months following the completion of the intervention.

Uses of ADAPT-ITT in Sexual Health Research

Sistas Informing Sistas about Topics on AIDS ([SiSTA], DiClemente & Wingood, 1995) is an example of one intervention that has been adapted for use among many populations. The original intervention is a traditional face-to-face intervention created for use among Black,

heterosexual, sexually active young adult women living in the U.S. The researchers found positive outcomes related to consistent condom use, self-control, sexual assertiveness, sexual communication, and partners' acceptance of consistent condom use (DiClemente & Wingood, 1995).

More than a decade after first implementing SiSTA, Wingood and DiClemente (2008) developed the ADAPT-ITT model to help guide researchers in the adaptation of existing interventions. SiSTA has since been successfully adapted for use among female drug and alcohol users (Belgrave, Corneille, Nasim, Fitzgerald, & Lucas, 2008), older Black women (Cornelius, Moneyham, & LeGrand, 2008), women in South Africa (Saleh-Onoya et al., 2008), Latina women (Wingood et al., 2011), and faith-based women (Wingood et al., 2013). It has also been adapted for use as a computer-based intervention (Card, Kuhn, et al., 2011).

The ADAPT-ITT model has also been used to adapt HIV interventions for use among incarcerated African American adolescents (Latham et al., 2012), as well as Black young adult women attending a mega-church in Atlanta and Zulu-speaking adolescents in South Africa (Wingood & DiClemente, 2008).

Use of ADAPT-ITT in the Current Study

The assessment and decision phases of the ADAPT-ITT model were completed during the development of this chapter. First, sexual health disparities, HRSB interventions, and learning preferences were assessed. While this assessment was conducted via literature review and not elicitation focus groups, a formative evaluation of sexual health disparities among young adult Black women was employed. Young adult Black women, age 18 to 24, were identified as the demographic group at greatest risk for the negative health outcomes associated HRSB. It was also discovered that this age group prefers the use of technologically advanced methods of

learning to traditional methods. Furthermore, their use of text messaging far outweighs their use of other forms of technology. Instead of creating a new intervention, a decision was made to adapt an evidence-based HRSB intervention into a text message intervention for young adult Black women. Sister to Sister was selected for adaptation because it is a *Compendium* best-evidence intervention, it is highly accepted among researchers and health educators alike, and its brief nature lends to the delivery of 160-character text messages.

The adaptation through training phases of the ADAPT-ITT model were implemented during Phase One of this study and the testing phase was implemented during Phase Two. The methods utilized for these phases are discussed in chapters 4 and 5, respectively. So as to prevent confusion between the phases of the ADAPT-ITT model and the phases of this study, the model phases will be referred to as stages hereafter.

Conclusion

The negative outcomes of HRSB among young adult Black women constitute health disparities affecting one of the country's most vulnerable populations. While traditional HRSB interventions serve as appropriate methods of encouraging sexual behavior change, technologically advanced interventions are also ideal. Text message interventions are easily accessible and have been shown to promote positive health-related behavior change, just like traditional interventions have done. However, text message interventions do not place unwanted time constraints on participants and they may not be as costly as traditional interventions. There are a number of text message interventions that have been shown to decrease HRSB. Among these interventions, however, an effective HRSB text message intervention created specifically for young adult Black women is lacking. Chapter 3 of this dissertation provides the philosophical underpinnings and theoretical framework for such an intervention.

CHAPTER 3 - THEORETICAL FRAMEWORK

Sexual health disparities among young adult Black women are perpetuated by high-risk sexual behavior (HRSB) and its subsequent negative health outcomes. For many years, researchers have created, implemented, and evaluated interventions that address sexual health disparities among vulnerable populations. Numerous philosophies and theories are used to guide such intervention development. An acknowledgement of philosophical underpinnings can help to ensure congruence among selected theories, study methods, and anticipated outcomes.

This chapter provides an overview of several philosophies upon which the proposed research study was designed. Appropriate learning, behavior change, and gender-specific theories are then introduced. Following a description of the constructs of each theory, an exemplar is provided to further clarify the relationships between the theory constructs and HRSB. Finally, a conceptual model is presented. Each of the constructs in the model will be used in the development and evaluation of the proposed HRSB text message intervention.

Philosophical Underpinnings

Within philosophy, epistemology aims to answer questions related to evidence, knowledge, and rationality (Godfrey-Smith, 2003; Meleis, 2012; Rodgers, 2005). Three philosophical schools of thought have influenced the design of this study: empiricism, critical theory, and pragmatism.

Empiricism

Empiricism is a philosophical school of thought that claims the source of all knowledge is experience (Godfrey-Smith, 2003; Rodgers, 2005). The two major tenets of contemporary empiricism are deductive reasoning and substantiation of theoretical claims (Weiss, 1995). These tenets lend to the quantitative nature of empirical studies. Deductive reasoning is the process of

moving from general to particular (Magee, 2001). Empiricists utilize deductive reasoning methods to maintain objectivity in their research and to clarify and predict phenomena (Weiss, 1995).

Substantiation of theoretical claims occurs when researchers repeatedly fail to falsify a hypothesis that was derived from the use of a theory, despite the use of valid and reliable instruments (Weiss, 1995). The purpose of substantiation is not to assert truth, but rather to provide evidence that is observable, reproducible, and generalizable. As such, the objective of theoretical substantiation is clarification of the concepts and relationships posed within a theory and prediction of the dynamic of phenomena. According to Magee (2001), prediction, as understood by empiricists, is not to establish universal “truths.” Rather than searching for certainty, empiricists recognize the value of probability. They view observations as a way to study various aspects of events, including but not limited to causal relationships (Magee, 2001). Thus, evidence is sought to increase knowledge about probabilities.

This study used the tenets of empiricism undergird the research methods for this study. These methods, as described in Chapter Four, were utilized to ensure objectivity of the research study. The use of theories is part of the empirical approach to this study. Several learning, behavioral, and gender theories were utilized to identify variables and predict changes in relationships among study variables. Additionally, the use of valid and reliable instruments aided in the observation of primary and secondary outcomes before and after the implementation of the intervention. The study hypotheses were then accepted or rejected. Finally, empirical methods can be utilized in subsequent studies to substantiate the hypotheses of this study.

Critical Theory

Critical theory (CT) is an approach to philosophy (Fontana, 2004). The tenets of CT can influence both quantitative and qualitative studies. The overarching goal of CT is emancipation, accomplished through empowering marginalized populations and liberating social change (Browne, 2000; Fontana, 2004; Mill, Allen, & Morrow, 2001). However, the acknowledgement of a research study as one influenced by CT is not dependent on the actual emancipation of a marginalized population. It is the emancipatory intent of the researcher that distinguishes a CT study from studies that utilize other philosophies or philosophical approaches (Fontana, 2004).

According to Browne (2000), critical theorists use research as a catalyst for emancipation while emphasizing the use of critical knowledge in order to challenge the status quo. Critical theorists also view knowledge as being value-neutral, and they recognize all knowledge as being influenced by social and historical factors. Additional assumptions of CT include a search for forces of domination and power imbalances within social structures, the importance of how language is used in knowledge development and meaning formation, the generally oppressive effects of research, and the inseparability of ideology and knowledge (Browne, 2000).

In CT, research and knowledge development have political undertones (Fontana, 2004). The influence of CT when designing and implementing research is rooted in researchers' desires to incite change through their work. Critical theorists identify disparities and inequalities, then use the research process and study findings to encourage change at local, national, and global levels. As such, it is essential that those utilizing CT are forthcoming about their political stance related to the content matter of their study (Fontana, 2004).

A democratic structure is utilized within CT to facilitate a relationship between researchers and their research participants. In a CT study, this relationship is collaborative,

nonhierarchical, and mutually educational. The collegial nature of CT studies permit research participants to be involved in meaning and power negotiations, knowledge construction and validation, and data analysis. Accordingly, researchers and research participants are viewed as co-researchers (Fontana, 2004).

Although the idea of co-researchers in the CT approach was not fully implemented in this study, members of the target population were recruited to a research advisory board (RAB) to work with the primary investigator (PI) in the development of the text message intervention. While they had no direct responsibility related to study recruitment, intervention implementation, or data collection and analysis, the RAB members provided their perspectives on the formation of the text messages, use of appropriate research methods, and interpretation of the study findings. Their perspectives were honored by the PI throughout the study process. Accordingly, aspects of CT were philosophical underpinnings of the study.

Pragmatism

Like CT, pragmatism is an approach to philosophy, but not a philosophy in and of itself (McCready, 2010). It is defined as both a theory of meaning and a method for determining that meaning (Magee, 2001; Menand, 2001). For pragmatists, new knowledge is sought when there is a lack of, need for, or desire for knowledge or when there is doubt associated with current knowledge (Magee, 2001). Pragmatists view knowledge as fallible, accepting it as true only while it works best (Magee, 2001; McCready, 2010). Warms and Schroeder (1999) write that, for pragmatist researchers, knowledge is valued for practicality, applicability, and utility. Pragmatists choose a research method by first mapping out the practical application of the study findings and subsequently determining the worthwhile nature, or “cash-value,” of the research questions (Warms & Schroeder, 1999).

In addition to their emphasis on practicality, pragmatists view themselves as active participants in the research process, and not simply as observers of study participants (Magee, 2001). Consequently, pragmatist researchers will likely utilize qualitative research methods, such as one-on-one interviews and focus groups, as opposed to quantitative methods like surveys and questionnaires. This allows the researchers to participate in data collection and analysis in a way that statistical analysis of data does not. Instead of simply observing participants' responses to surveys and questionnaires, pragmatists are a part of the conversation.

The pragmatist approach to research and its highlights on utility of knowledge from the perspective of the participants guided the PI's desire to conduct this study. The idea for the study came from the anecdotal experiences of the PI with female participants. In her practice as a women's health nurse, she noted many negative outcomes of HRSB, specifically among young adult Black women. It was apparent that these women typically sought health care only after becoming pregnant or experiencing symptoms of a sexually transmitted disease (STD). Following a review of HRSB interventions, appropriate learning methods, and uses of technology, text messaging was identified by the PI as a meaningful way to educate young adult Black women about sexual health disparities in non-clinic settings.

The pragmatist approach is highlighted in this study with the incorporation of the RAB and qualitative analysis of phase one and two findings. The outcomes of each RAB meeting were analyzed using qualitative content analysis with the goal of understanding what participants identified as problems and solutions. This form of data analysis was also used in phase two to assess the acceptability of the intervention among the target population. Further information on RAB meetings and data analysis are provided in chapter 4. Details on phase two measurement tools and data analysis are discussed in chapters 5 and 6, respectively.

Intersectionality

Intersectionality can be traced back to Sojourner Truth's 1851 "Ain't I a Woman?" speech (Bowleg, 2012). However, Kimberle Crenshaw popularized the concept of intersectionality in several landmark writings (Crenshaw, 1989, 1991). In these publications, Crenshaw emphasizes that although race and gender are often viewed as separate entities, their intersection is an important aspect of Black women's life experiences. She asserts that the most marginalized populations are ignored when scholars view age, gender, ethnicity, class, sexual orientation, and other socio-demographic characteristics individually. Furthermore, Crenshaw identifies Black women's unique needs, concerns, and experiences of discrimination as being unlike those of non-Black women or Black men. She urges researchers, policymakers, and others to consider the compounded effects of intersectionality on discrimination, instead of focusing solely on the sum total of negative outcomes caused by singular demographics (Crenshaw, 1989, 1991).

There is no specific way in which researchers or practitioners must integrate intersectionality into research or practice. Cho, Crenshaw, and McCall (2013) highlight the vast uses of intersectionality as a form of research analysis, a theoretical framework, a research methodology, or a way of practicing in the field. Many authors highlight intersectionality in their work (Caiola, Docherty, Relf, & Barroso, 2014; Price, 2011; Wyatt et al., 2013). Others have created tools to measure intersectionality (Stirratt, Meyer, Ouellette, & Gara, 2008) or highlighted several tenets of intersectionality (Bowleg, 2012). No matter how intersectionality is utilized, what is most important is the acknowledgement that the interlocking identities of vulnerable populations often cause them to experience the brunt of systematic inequality.

Carbado, Crenshaw, Mays, and Tomlinson (2013) identify several important themes that have emerged throughout the years of implementation of intersectionality. First the authors note that intersectionality is still developing. That is to say, there have been numerous iterations of intersectionality and there will continue to be. Intersectionality is a fluid idea that continues to highlight new concerns and directions for additional inquiry. Second, intersectionality is not discipline-specific (Carbado et al., 2013). It may be implemented in social sciences, policy, research and practice.

Next, intersectionality is not only for U.S. use, but can be applied globally (Carbado et al., 2013). Power inequality, health and social disparities, and categorization of people based on their various demographic characteristics are practices held worldwide. Furthermore, they contend that, despite the fact that intersectionality has been utilized among various populations, there is still more discussion to be had regarding the intersection of race and gender among Black women. The final theme of intersectionality lies in its social movement influences. In this sense, intersectionality is like critical theory in that it has undeniable political undertones (Carbado et al., 2013).

Young adult Black women constitute a marginalized population that has experienced sexual health disparities for many years. It is important to recognize the intersection of age, race, and gender in this population. As a result of this intersection, young adult Black women face sexual health risks and outcomes that are different from those of other groups. This study was designed to facilitate the empowerment and liberation of young adult Black women from the oppressive nature of their negative sexual health status.

Summary of Philosophical Underpinnings

Improvement of the current and future sexual health status of young adult Black women was the driving force behind this study. The study utilized empirical research methods to add new knowledge to the fields of behavior change, sexual health, and mobile health (mHealth). The PI used a CT approach in an effort to create knowledge that can be used by young adult Black women for liberation from societal forces that make them vulnerable to sexual health disparities. The PI was influenced by the pragmatist goal of making a difference in an area that matters to the study target group. The intersection of age, ethnicity, and gender was highlighted to support the ways in which the sexual experiences and outcomes of young adult Black women differ from the sexual experiences and outcomes of others. Consequently, the concept of intersectionality was used to support the need for an age-appropriate, ethnic and gender-specific intervention. This resulted in the development of a HRSB mHealth intervention for young adult Black women that aims to increase positive outcomes associated with condom use.

The discussion of philosophical underpinnings of research studies is often missing from behavior change and intervention literature. Assumptions can be made regarding the possible philosophical schools of thought to which researchers subscribe, but these assumptions may be difficult to confirm. It is important for researchers to understand and identify the ideologies that drive their research studies. This discussion of philosophical underpinnings serves as an example for inclusion of philosophical writings in future sexual health, behavior change, and mHealth studies.

Theoretical Framework

Glanz, Lewis, and Rimer (2002) write that theories contain groups of concepts, definitions, and propositions. These authors also assert that theories offer systematic analyses of

events or situations, clarify and predict events or situations, are generalizable and testable, and answer the questions “what?” “why...?,” and “how...?” Most importantly, theories provide an understanding of the relationship among the various concepts of a phenomenon (Meleis, 2012).

Moreover, theories are used to describe, explain, or predict conditions, events, relationships, responses, or situations (Meleis, 2012). They are the foundational basis on which content can be created and they suggest variables of interest for evaluation purposes. There are many types of theories that are utilized for many different reasons. Particular theories can be complementary to one another, although they may appear to be contradictory because they highlight different realities (Meleis, 2012).

While some authors argue that the use of theories does not influence the effectiveness of behavioral interventions (Prestwich et al., 2014), others believe theories are an essential facet of these efficacious interventions (CDC, 1999; Melnyk & Morrison-Beedy, 2012). Utilization of theories to conceptualize sexual health interventions is a standard of the field. This can be noted by the more than four-fifths of traditional, face-to-face STD interventions among Black women utilize that behavior change theories in their theoretical frameworks (Crepaz et al., 2009). Among mHealth interventions, however, identification of theoretical frameworks is lacking. Consequently, researchers are now calling for the use of behavior change theories to guide mHealth interventions (Bull, 2011; McAlister, Perry, & Parcel, 2008; Tomlinson, Rotheram-Borus, Swartz, & Tsai, 2013).

In this study, an evidence-based sexual health intervention was adapted for text message delivery. It would have been advantageous to include not only a theory of behavior change in the study’s theoretical framework, but also a theory of distance learning and instruction. Unfortunately, there is no theory developed for mobile learning. As such, traditional learning

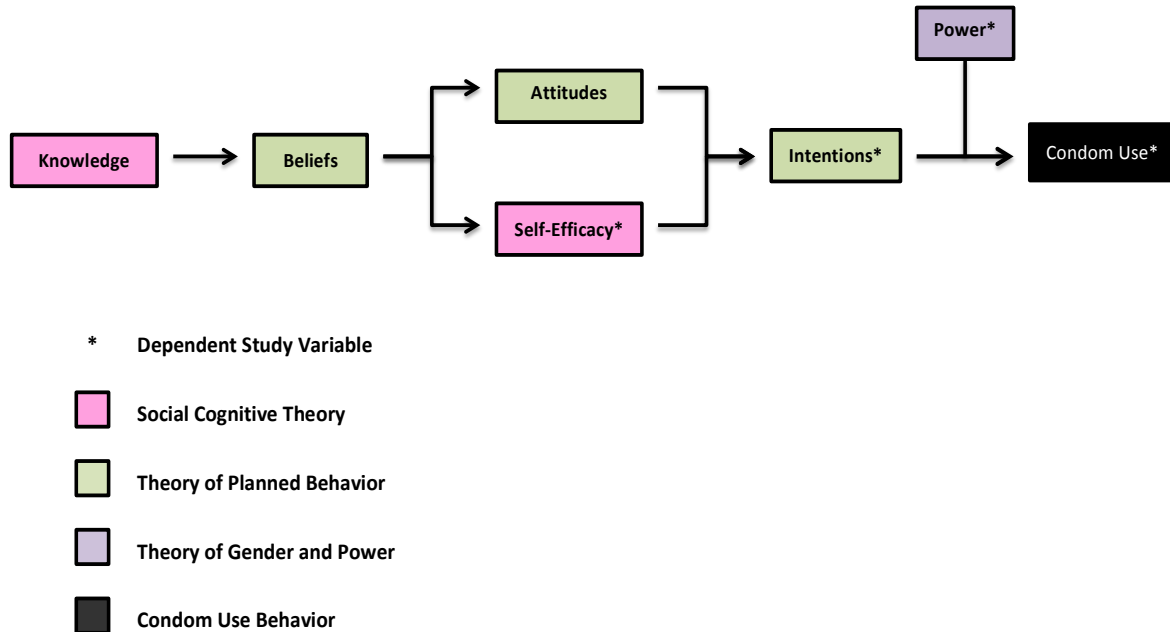
theories continue to frame mHealth and other mobile learning studies. The Social Cognitive Theory (SCT) is one such learning theory.

In addition to its use as a learning theory, SCT is also widely used in sexual health intervention studies as a behavioral theory. The Theory of Planned Behavior (TPB) is another behavioral theory that has been widely used in the theoretical frameworks of sexual health interventions. However, these theories lack consideration for cultural and gender factors and should not be used in isolation. Thus, theories such as the Theory of Gender and Power (TGP) may be included in theoretical frameworks of sexual health interventions.

For this study, selected constructs from SCT, TPB, and TGP were integrated into a model of psychosocial condom use mediators (Figure 3.1). The remainder of this chapter provides an overview of these theories, highlights their uses in sexual health interventions and text message interventions, and identifies the constructs from each theory that were selected for use this study's conceptual model.

Figure 3.1

S2S Text Message Intervention Conceptual Model



Social Cognitive Theory

The Social Cognitive Theory (SCT) is one of the most utilized theories in health behavior research (Painter, Borba, Hynes, Mays, & Glanz, 2008). It is a unique theoretical model because, unlike other models that are used solely for prediction of behaviors, SCT can be used to predict behavior and to encourage behavior change (Bandura, 2004). SCT was first introduced by Bandura (1986) as an expansion of his Social Learning Theory (1977). The theory claims that human behavior is neither a result of internal nor external stimuli. Rather, it is one aspect of a triadic reciprocal relationship among behavior, cognitive/personal factors, and environmental events. SCT also purports that learning is often achieved through observation of others. As such, learning is not always a result of personal experience (Bandura, 1986).

SCT recognizes five constructs through which learning and decision-making occur: symbols, forethought, vicariousness, self-regulation, and self-reflection (Bandura, 1986). Furthermore, Bandura (2004) identifies several core determinants of SCT that can be applied to health promotion: knowledge, perceived self-efficacy, outcome expectations, goals, and perceived facilitators and impediments.

Constructs of SCT. When utilized as a learning theory, the five constructs of SCT help researchers to understand how behavior is learned. This understanding provides additional insight into actions that may encourage behavior change. As a young woman's capacity for each construct is enhanced, so is her ability to learn behavior.

Symbolizing capability. The first tenet of SCT is that a person's ability to adapt to their environment is enabled by their capacity to utilize symbols (Bandura, 1986). Through symbolism, people have the ability to test solutions to various problems without actually having to experience those problems. Once potential scenarios are considered, based on lessons learned from previous experiences, actions can either be taken or disregarded. For instance, a young woman who has previously engaged in unprotected sex, yet has never been diagnosed with an STD, may choose to forgo the use of condoms during future sexual encounters. Conversely, if she has a history of STDs, she may decide to use condoms with every future sexual encounter. In both of these instances, the young woman's prior experience with condoms serve as a symbol to help her determine future actions in similar situations.

Bandura (1986) points out that although symbolism guides future actions, these actions may not be rational. He contends that a person may use faulty decision-making if they fail to consider all possible outcomes or if their actions are based on partial information. Therefore, even if they had the capacity to utilize symbols in decision-making, they may not have chosen

reasonable actions; thus, their ability to use symbols does not always lead to positive or reasonable actions (Bandura, 1986). Perhaps, a young woman with no history of STDs engages in unprotected sexual intercourse with a new partner. Some people may not view the woman's unremarkable STD history as a logical reason to continue to forgo condom use. Although her choice to engage in unprotected sexual intercourse may not be sensible to others, the young woman may have used her symbolizing capability to make this decision. SCT is a theory that clarifies learning and decision-making processes related to behavior, irrespective of the logical nature of the behavior or its outcome. Consequently, symbolism is a tool that can be utilized in both good and bad decision-making processes.

Forethought capability. According to Bandura (1986), most behavior is purposeful and is based on forethought. While symbolism may mediate actions based on past outcomes, the behavior may also be motivated by desired future outcomes. Forethought is a cognitive activity that allows future possibilities to influence present behavior (Bandura, 1986). SCT does not imply that desired outcomes will occur for certain. Neither does it imply that every potential outcome is considered before deciding upon an action. The utilization of forethought as a decision-making tool is simply the consideration of a desired outcome associated with the chosen behavior.

Using her forethought capability, a young woman with no history of STDs may continue engaging in HRSB because she believes she is not at risk for contracting an STD. She may also choose to forego the use of condoms to appease her sexual partner(s). Or, she may value the physical pleasure of unprotected sexual intercourse over the risk of acquiring an STD. These and other scenarios may lead the young woman to continue with her current HRSB. Unfortunately,

although she desires to remain free of STDs, if she continues to engage in HRSB, the young woman may be infected with an STD.

As with symbolism, forethought is not indicative of positive outcomes or rational decision-making. Bandura (1986) contends that, even when behaviors are the precursors of detrimental outcomes, the person engaging in the behavior has typically considered the consequences of such behaviors. In this sense, the construct of forethought only assumes that people consider a desired future outcome before acting in a certain manner. The positive or negative nature of that outcome is not a consideration in SCT.

Vicarious capability. Essentially anything that can be learned through personal experience can also be learned through observation of others' actions and the consequences of those actions (Bandura, 1986). The capacity to learn vicariously is an important learning mechanism because learning solely through trial and error can be extremely costly and sometimes fatal. As the level of danger associated with an action increases, so must the utilization of vicarious observation. Likewise, the less innate a behavior is, the more one must rely on vicarious learning (Bandura, 1986).

Vicarious capability is distinct from symbolizing and forethought capabilities in a number of ways. First, symbolizing capability is the ability to use personal experiences to influence one's own behavior. In contrast, vicarious capability is the ability to use someone else's experiences to influence one's own behavior. Second, vicarious learning requires behavior modeling by another person, whereas symbolism and forethought can occur in isolation.

Behavior modeling is most effective when the observer and the observed share similar demographics (McAlister et al., 2008). The Sister to Sister curriculum, for instance, was implemented by a Black, female nurse educator and used videos and printed material showcasing

Black women (Jemmott et al., 2007). SCT supports the assumption that cultural and gender similarities between the Black female participants and the Black female facilitators, video actors, and print models enhanced the efficacy of the intervention. Each of the other culturally competent and gender-specific *Compendium* interventions highlighted in chapter 2 also utilized facilitators of the same ethnicity and gender as the intervention participants, thus supporting a standard for such interventions.

Although a model is a necessary component of vicarious observation, the model does not have to be physically present with the observer. In this sense, mass communication is a central aspect of SCT (McAlister et al., 2008). Through advancements in technology, vicarious observation can occur through social media, television and film, or videos sent via text message, as occurred in this study.

For a young woman who is engaging in HRSB, vicarious learning may occur when she is told of a friend's new STD diagnosis. Likewise, she may also see a highly relatable character in a movie or popular television show that regularly engages in HRSB, but is never faced with the adverse outcomes of this behavior (i.e. never diagnosed with an STD). The frequency of vicarious observations and the young woman's capacity for vicarious learning will influence her to decision to engage in or refrain from unprotected sexual intercourse in the future.

Vicarious capability should be viewed as an extremely important aspect of sexual health education. The risk of acquiring an STD when engaging in non-protected sexual intercourse can be extremely high. What's more, the outcomes of some STDs can be physically and emotionally devastating. If young women can use their vicarious capability to prevent them from engaging in HRSB, their subsequent symbolizing capability may yield positive sexual health outcomes.

Self-regulatory capability. Bandura (1986) acknowledges self-regulation as an important motivator of behavior. Whereas many people may contribute behavior change to willpower, it should actually be contributed to the acquisition and management of skills that will facilitate the change (McAlister et al., 2008). The attainment of such a skill-set can be accomplished in six ways: self-monitoring, goal setting, feedback or evaluation, self-reward, self-instruction, and enlisting social support.

Self-regulation, while an internal mechanism, can also be influenced by external factors. For instance, a particular young woman may be motivated to use condoms so that she can prevent acquiring an STD and disappointing her parents. Another young woman may choose to forgo the use of condoms to please her boyfriend. Whether the motivation to perform a behavior is internal or external, the standards set for oneself and post-action self-evaluation lead to self-regulation capability. Without pre-action standards (i.e. self-monitoring, goal-setting, self-instruction, and enlisting social support) and post-action evaluation (i.e. feedback and self-reward), self-regulation is ineffective (Bandura, 1986).

Self-reflective capability. Self-reflection, as described by Bandura (1986), is a person's ability to analyze their experiences and consider their thought processes. This aspect of SCT allows a clear understanding and evaluation of oneself and, if necessary, alteration of one's thinking. Prior to behavior change, self-reflection determines the amount of effort to be spent on behavior change activities (Bandura, 1986). If behavior change attempts are unsuccessful, self-reflection allows a person to decide how long they will continue trying to achieve previously unsuccessful actions. Thoughts concerning the nature of these actions and their associated outcomes are components of self-reflection (Bandura, 1986).

As she utilizes her self-reflective capability, a young woman can determine whether or not her condom use negotiation skills are effective. If she succeeds in encouraging her sexual partner to use condoms, she may choose to continue using the same negotiation techniques. If she is unsuccessful in encouraging her partner to use condoms, she may also decide to use different negotiation techniques in the future. She may also decide to continue using the same techniques in hopes that they will work in her favor the next time. Based on the outcome of her future condom negotiation attempts, the young woman may utilize self-reflection to select an efficacious plan of action or to forgo the plan to use condoms altogether.

Determinants of SCT. When utilized as a behavioral theory, an assessment of the five health promotion determinants of SCT helps researchers to better understand the causes of HRSB. Each of the determinants is a measurable outcome that can be assessed for change.

Knowledge. According to Bandura (2004), knowledge is an essential determinant of behavior change. A person who is unaware of their risk for negative health conditions will not have much incentive to change their health-related behaviors. While knowledge alone does not have a large effect on behavior change, lack of health-related knowledge may serve as a cause of poor health choices and participation in negative health behaviors (Bandura, 2004).

An understanding and appreciation of the need for knowledge in behavior change interventions is paramount to SCT. Researchers using SCT should encourage the widespread knowledge of health disparities among vulnerable populations. In HRSB interventions, knowledge should include STD risk factors, modes of STD transmission, and methods of STD prevention. This information can be incorporated into various activities that are shared with participants. Knowledge of HRSB and associated negative sexual health outcomes should be the basis upon which sexual health education is built.

Perceived self-efficacy. Of all the determinants of health behavior, self-efficacy is the most important because of its influence on each of the other determinants (Bandura, 2004). Described as a judgment of a person's ability to carry out an action, it is the most pervasive type of reflective thinking (Bandura, 1986). In order to change negative behaviors leading to untoward health outcomes, the person must first believe in their ability to change. Consequently, interventions utilizing SCT in their theoretical frameworks should include activities that are designed to build self-efficacy and/or maintain high levels of self-efficacy.

Bandura (2004) asserts that low self-efficacy precludes any incentive to persist when difficulties arise during the behavior change process. Thus, for a young woman who does not believe in her ability to influence her partner to use condoms, increased knowledge of her risk of STDs will not lead to changes in her condom use behaviors. At the first sign of opposition, she will give in to her sexual partner's condom use desires. On the other hand, difficulty will not deter the desire for change in a person with high self-efficacy (Bandura, 2004). High self-efficacy among young women will facilitate their behavior change.

In a meta-analysis of individual and group-level STD interventions implemented among Black women ($N = 13.35$, $M = 27$ years), Crepaz et al. (2009) found that self-efficacy is among the most important constructs included in the theoretical framework for these interventions. Cochran and Mays (1993), however, argue that Black women's participation in HRSB may not be a question of low self-efficacy. These authors say these women may engage in unprotected sexual intercourse in order to maintain their physical or financial wellbeing, to fit in with other Black women, or to show their allegiance to referent others in the Black community (Cochran & Mays, 1993). Thus, self-efficacy alone may not be enough to change behavior.

Expected outcomes. Behavior change outcomes may be noted as physical changes, social reactions of others, or self-evaluation of one's own reactions (Bandura, 2004). Behavioral outcomes are similar, yet not synonymous with behavioral consequences. Consequences are defined as the positive and negative effects that can result following an occurrence of a concept (Meleis, 2012). The major difference between expected outcomes and consequences is that the former are always anticipated, while the latter may or may not be unanticipated. Expected outcomes are planned, purposeful occurrences. Consequences, however, may be unforeseen results of behavior.

Expected outcomes are meant to increase self-satisfaction and self-worth (Bandura, 2004). They are based on personal values and individual perceptions of reality. Accordingly, expected outcomes are the basis for subjectivity in decision-making (McAlister et al., 2008). What is important to one sexually active young woman may not be important to another. For instance, the expected outcome of parental support and satisfaction may be the reason a young woman always uses condoms during sexual intercourse. Conversely, the expected outcome of pregnancy may be another young woman's reason for engaging in HRSB.

When combined with self-efficacy, outcome expectations determine participation in chosen behaviors (Bandura, 2004). Those with high self-efficacy will have the confidence to engage in behaviors that are associated with expected outcomes. However, those with low self-efficacy may not have the confidence to follow through on actions that will assist in the materialization of their expected outcomes.

Goal setting. Setting goals can mediate behavior change. According to Bandura (2004), a person with high self-efficacy is more likely than a person with low self-efficacy to set high goals and remain committed to attaining them. In addition to self-efficacy, forethought is an

important aspect of goal setting. The greater one's capacity for forethought, the more likely they are to discount behavior change costs and ignore immediate benefits of alternative actions (McAlister et al., 2008).

Bandura (2004) emphasizes that goals provide self-incentives for behavior change and serve as a personal guide for the development of healthy habits. Long-term goals may be sufficient when other competing distal goals are not present. Short-term goals, however, are often a better choice to encourage health behavior changes (Bandura, 2004). A young woman's long-term goal may be to prevent contracting an STD for the duration of her college education. An acceptable short-term goal for this woman would be to prevent STD contraction during the current academic term.

Goals should not be confused with expected outcomes. One major difference between goals and outcomes is that goals are based on personal preference, whereas expected outcomes may stem from personal *or* societal norms. Goals are based on the value system of the person performing an action (Bandura, 2004). That is to say, a person will only set goals for action or behaviors that are of importance to them. So, if a young woman values a clean bill of sexual health, she may set a goal of never contracting an STD. If she has no desire to use condoms during sexual intercourse, she will not set a goal to do so. On the other hand, if she values her partner's desires over her own, she may have a goal of keeping his desires met even if this means putting her own health at risk.

Perceived facilitators and impediments. When a change is met with effective facilitators or few challenges, it is easier to accomplish (Bandura, 2004). Conversely, if there are few facilitators and many obstacles to change, that change will be much more difficult to achieve.

Those with high self-efficacy will seek out facilitators to behavior change and maintain perseverance when faced with behavior change setbacks (Bandura, 2004).

Facilitators and impediments to health-related behavior change can have personal, situational, or health system origins (Bandura, 2004). Irrespective of a person's capacity for observational learning, if their environment is unsupportive then behavior change attempts will be futile (McAlister et al., 2008). Therefore, SCT-influenced interventions should highlight facilitators of and remove hindrances to behavior change.

For a young woman seeking to change her HRSB, behavior change facilitators may include enrolling in a local STD-prevention program, obtaining free condoms from a health center, or a having supportive sexual partner. Conversely, HRSB change impediments for this same young woman may include a having negative attitude toward or beliefs about condoms, lacking access to condoms, or a maintaining a relationship with a sexual partner who does not want to use condoms. The use of theory in a HRSB intervention should always address these and other socio-ecological factors that are associated with the behavior to be changed (Crepaz et al., 2009).

Use of SCT in sexual health interventions. As discussed in chapter 2, the *Compendium of Evidence-Based Behavioral HIV Interventions* (CDC, 2015a) is the optimal compilation of STD prevention programs. Prior to being identified by the CDC as evidence-based interventions and published in the *Compendium*, these interventions are assessed using rigorous criteria. There are five *Compendium* that were implemented among Black women, including Sister to Sister (Jemmott et al., 2007), which will be adapted for use in this study. SCT is the most highly utilized theory of these interventions. The Women's Co-Op Intervention (Wechsberg et al., 2003; Wechsberg et al., 2004) is the only *Compendium* intervention implemented among Black

women that did not utilize SCT. All of the *Compendium* interventions that included SCT in theoretical framework reported findings of at least one SCT construct.

Among the women in the Female and Culturally Specific Negotiation intervention ($N = 68$), Sterk, Theall, Elifson, et al. (2003) found significant time effects for communication with casual partners—a potential facilitator or impediment of condom use—among all study participants. These authors noted increased communication related to STD history ($p < .01$), HIV status ($p < .01$), and past sex partners ($p < .01$) between baseline and six-month follow-up. In a separate study of this intervention ($N = 265$), Sterk, Theall, and Elifson (2003) documented a significant increase in HIV status communication between the intervention group and their steady partners ($p < .05$). However, this increase in communication had no significant time by group interactions.

DiClemente et al. (2009) discovered intervention interactions for condom use self-efficacy ($p < .001$) and STD/HIV prevention knowledge ($p < .001$) among the adolescent Black women enrolled in their HORIZON intervention ($N = 715$). Likewise, O'Leary et al. (2008) reported statistically significant time by group increases in condom knowledge at immediate ($p = .001$), three months ($p = .01$), and six months post-intervention ($p = .02$) for the women in the Sister to Sister intervention study ($N = 564$). There were also significant time by group differences in self-efficacy to carry ($p = .05$) and use condoms ($p = .05$), which favored the intervention group. Furthermore, O'Leary et al. (2008) found that condom use self-efficacy mediated condom use among these women.

Finally, DiClemente et al. (2004) documented positive intervention effects on HIV knowledge ($p < .001$), condom barriers ($p = .003$), and condom use self-efficacy ($p < .001$) at six months post-intervention among the participants in the SiHLE intervention study ($N = 522$).

These HIV knowledge ($p < .001$) and condom use self-efficacy ($p < .001$) outcomes were sustained at 12 months post-intervention. The positive changes in SCT constructs seen in these *Compendium* interventions suggests that SCT is an appropriate theory to be used in the development and evaluation of high-risk sexual behavior (HRSB) intervention for young adult Black women.

Use of SCT in text message interventions. In addition to its use in traditional evidence-based interventions, researchers are encouraged to apply SCT to interventions implemented using new technologies (McAlister et al., 2008). SCT has been included in the theoretical framework of effective HRSB text message interventions including Project Tech Support (Reback et al., 2012) and safer sex texts for Australian young adults (Gold, Aitken, et al., 2011; Gold, Lim, et al., 2011). However, none of these intervention studies report findings of SCT constructs. The 6001 HRSB text message intervention did not report the use of any theories in its intervention design. Still, Jamison et al. (2013) measured knowledge—an SCT construct—among study participants. The authors found that the intervention did not have any treatment effects on knowledge ($p = .56$). Additional use of SCT in text message studies and reporting of SCT construct findings will help to close the knowledge gap related to the efficacy of theoretical constructs in text message interventions.

Use of SCT in the current study. Because SCT was applied to the Sister to Sister theoretical framework (Jemmott et al., 2007) and in an effort to maintain the integrity of the intervention, it will be included in the conceptual model for the proposed study. Through activities including videos and condom use demonstration, the intervention encouraged the use of symbolizing, forethought, vicarious, self-regulatory (i.e. self-monitoring), and self-reflection

capabilities to mediate positive changes in HRSB. Self-efficacy was also used as an independent variable, among which changes were noted.

Using SCT as a framework for learning new behaviors, text message recipients were encouraged to think about past experiences of HRSB, if any. They were educated on current HIV/STD statistics and their risk for acquiring these diseases. They were sent video clips in which several young adult Black women spoke of their experiences contracting HIV and another young woman engaged in condom negotiation techniques with her partner. They were also be given tools, in the form of pictures, to help build condom negotiation skills and condom use skills. Lastly, they were encouraged to reflect on their sexual behavior and make adjustments to the behavior as necessary.

Self-regulatory capability was of utmost importance in this study. The text messages developed for this intervention provided the skills necessary to change HRSB or to continue abstaining from this behavior. However, the intervention allows for neither continuous external monitoring of participants' sexual behavior nor an endless stream of text messages. As with all other behavior change interventions, the study intervention had a predetermined time of implementation. Once the intervention was completed, it was the responsibility of the participants to maintain the actions that influenced their anticipated behavior change. If self-regulatory capability was low, participants may have had a difficult time avoiding disadvantageous patterns of sexual behavior.

Two of the three goals of Sister to Sister identify health-related behavior change determinants of SCT. These goals are to increase knowledge of HIV and increase confidence in condom application and condom use negotiating skills (Jemmott & Jemmott, 2009). Accordingly, the knowledge and self-efficacy constructs of SCT are included in the conceptual

model for the study. However, as knowledge is a precursor of self-efficacy, only self-efficacy is measured.

The expected outcomes, goal attainment, and perceived impediments and facilitators constructs of SCT were not included in the conceptual model. There are many individual and societal factors that may affect each of these determinants, as discussed in chapter 2. Thus, while a discussion of these determinants is included in the Sister to Sister curriculum (Jemmott & Jemmott, 2009) and, in part, in the messages adapted for this study, they are not identified as variables of the study and are measured as outcomes of the intervention.

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) was developed by Ajzen (1991) as a way to predict behavior. It is an extension of the Theory of Reasoned Action (TRA), which was developed by Fishbein and Ajzen (1975). As the precursor to TPB, TRA provides an understanding of the relationships among beliefs, attitudes, intentions, and behaviors. It has three major claims. First, beliefs are the determinants of attitudes. Second, attitudes and subjective norms work in conjunction as the determinants of intentions. Finally, intentions are the determinants of behavior. Consequently, it is the intentions of a person that determines whether or not a behavior will be carried out (Fishbein & Ajzen, 1975).

The development of TPB was necessary because TRA does not account for behaviors that are outside of a person's volition (Ajzen, 1991). Accordingly, TPB adds the concept of perceived behavioral control to the TRA model. It also replaces the theoretical construct of beliefs with that of subjective norms. Instead of completely removing beliefs from the new model, however, Ajzen (1991) identifies behavioral beliefs, normative beliefs, and control beliefs as influencers of attitudes, subjective norms, and perceived behavioral control,

respectively. The addition of perceived behavioral control to TPB does not conflict with the relationships among attitudes, intentions, and behaviors as identified by TRA.

The application of TPB to any decision-making process may yield either positive or negative consequences. In this sense, TPB is similar to SCT. Neither theory requires the presence of positive or welcomed behavioral outcomes in order to establish substantiation of the theories. The constructs of TPB give an overview of the process used to decide an action. Regardless of the outcome of that action, consideration of beliefs, attitudes, subjective norms, perceived behavioral control, and intentions occurs during the decision-making process.

Beliefs. Whether learned as a result of one's own experiences or through the observation of the experiences of others, beliefs provide the foundation for attitudes, intentions, and behaviors (Fishbein & Ajzen, 1975). In the absence of force, coercion, or manipulation, human behavior is guided by one of three types of beliefs: behavioral beliefs, normative beliefs, or control beliefs (Ajzen, 1991). These beliefs are the respective indirect measures of attitudes, norms, and perceived behavioral control (Montano & Kasprzyk, 2002).

A person can have many beliefs regarding a specific behavior, some positive and others negative. As such, behavior is the result of a cumulative set of beliefs, and not simply one isolated belief (Fishbein & Ajzen, 1975). These cumulative beliefs and their influence on behavioral intentions is the primary determinant of behavior (Ajzen, 1991). Thus, a young woman with positive beliefs concerning condom use would be expected to use condoms during sexual intercourse. Similarly, a young woman with negative condom beliefs would be expected to engage in HRSB.

In elicitation interviews with African American women ($N = 50$, $M = 20.5$ years), Sales, DiClemente, Davis, and Sullivan (2012) identified a belief that introducing condoms after having

already engaged in HRSB with their current partners may cause the men to question the women's faithfulness. These young women also believed that introducing condoms implies that their sexual partners are unfaithful. Similarly, Bonacquisti and Geller (2013) found that 7% of participants ($N = 90$, $M = 28.45$ years, 68% African American) engaged in HRSB because of the belief that condom use will cause their partner to lose trust in them. They also found that an additional 6% of these women engaged in HRSB because they believed encouraging condom use would make their partner feel as if he was not trusted. So, although some women may want to use condoms, they may believe that doing so will give the appearance of their unfaithfulness or the appearance of their concerns about their partners' unfaithfulness. Instead of causing potential chaos in their relationships, women may continue to engage in condom nonuse.

Attitudes. Fishbein and Ajzen (1975) describe an attitude as a learned predisposition that requires a person to respond in a consistent manner. These authors contend that this predisposition does not always ensure that the predicted behavior will be carried out. For instance, a young woman may have a negative attitude toward HRSB, yet she may engage in condom nonuse occasionally. In contrast, a young woman with a negative attitude toward condoms may decide to use them if her partner does not want to engage in unprotected sexual intercourse. Thus, external factors can cause a woman to participate in a behavior about which she has a negative attitude. These factors can also prevent participation in a behavior about which one has a positive attitude.

Several studies have noted a positive association between attitudes toward condoms and subsequent condom use among young adult Black women (Gakumo, Moneyham, Enah, & Childs, 2012; Kiene et al., 2008; Kogan et al., 2010). Kiene et al. (2008) studied 116 college students ($M = 19.15$ years, women = 57.8%; Black = 5.1%) and found that while attitudes toward

condoms may vary daily, these attitudes are still positive predictors of daily condom use (*OR* 3.03, 95% CI 1.40-6.54, $p < .01$). Thus, frequent changes in attitudes toward condoms are associated with corresponding changes in actual condom use.

Daniels et al. (2013) found that 41.1% of women ($N = 4,660$, age range = 15 – 44 years) discontinued condom use because their partners do not like condoms. Similarly, more than 8% of young women under 25 ($n = 1,239$) reported engaging in HRSB because their partner did not want to use condoms (Mosher et al., 2012). Sales et al. (2012) also identified that women engage in HRSB because their partner either dislikes condoms or is in opposition to their use for some other reason. While these causes of condom discontinuation are not identified as negative attitudes by Daniels et al. (2013), Mosher et al. (2012), or Sales et al. (2012), it can be presumed that a negative attitude by a young woman or her partner is present in each of the aforementioned instances.

Much like negative attitudes, ambivalent attitudes may also lead to condom nonuse, and thus facilitate HRSB in some young adult women. Sales et al. (2012) assert that an ambivalent attitude toward pregnancy was a significant barrier to condom use for the women in their study. For these women, an unintentional pregnancy was not viewed as detrimental to their lives or their relationships. In a separate study of African American women ($N = 51$, $M = 19.43$), Murray et al. (2013) found that while 72.5% of participants were not actively trying to become pregnant, 60.8% of these women characterized pregnancy as “not what [I] want, but [I] would deal with it.” Furthermore, 49% characterized an STD as a “hassle, but not the worse thing.” Still, these sentiments of ambivalence were inconsistent with the women’s rates of HRSB, as 72.5% of the participants reported contraceptive use during their most recent sexual encounter (Murray et al., 2013). Thus, ambivalence may not always be associated with HRSB.

Of all SCT and TPB constructs, attitudes have been found to be one of the most strongly correlated predictors of condom use (Reid & Aiken, 2011). While attitudes are generally noted as an acceptable predictor of behavior, a young woman's attitude may be more of a reflection of her attitude toward HRSB with a specific sexual partner than her overall attitude toward HRSB. Reid and Aiken (2011) found that attitudes were a greater predictor of condom use among women with steady sexual partners than among women with casual sexual partners.

Subjective norms. The construct of subjective norms in TPB is similar to the social attribute of outcome expectations in SCT (McAlister et al., 2008). A clear understanding of normative behaviors begins with an appreciation of beliefs. Whereas the TPB construct of beliefs refers to the beliefs of oneself, the construct of subjective norms refers to the beliefs of others. When a person is motivated to comply with the normative beliefs of referent others, they are yielding to the pressure of a subjective norm (Fishbein & Ajzen, 1975).

For young women, subjective norms may be the result of parental, peer, or societal influence. A young woman who engages in HRSB because of its acceptability among her friends is being influenced by subjective norms. Likewise, the subjective norms of people within certain religions may prevent some young women from using contraception. On the other hand, subjective norms can also encourage condom use. Television commercials promoting safe sex, for instance, support positive subjective norms. These norms may overshadow the negative subjective norms to which a young woman is exposed, causing a decrease in HRSB.

Perceived behavioral control. TPB's perceived behavioral control construct is similar to SCT's self-efficacy construct (Bandura, 2004). It is determined by the existence or nonexistence of facilitators of and barriers to behavior (Montano & Kasprzyk, 2002). While it may appear that this construct can be measured objectively, the perception of behavioral control should always be

a self-assessment. It is the person responsible for the behavior change that should determine their ability to successfully make the change.

An assessment of perceived behavioral control is a necessary aspect of HRSB intervention research because the behavior requires action on the part of two people. At times, the condom use beliefs, attitudes, subjective norms, or intentions of a young woman may differ from those of her partner. In this case, the more powerful partner may cause the less powerful partner to act in a manner that is inconsistent with their beliefs, attitudes, subjective norms, and intentions. Consequently, sexual health researchers should always select TPB over TRA because of its emphasis on perceived behavioral control.

Perceived and actual behavioral control differ in that the former construct is a young woman's self-assessment of her individual power, while the latter is a result of the combined power of both the young woman and other external factors. These factors can include her sexual partner, environmental factors, or societal factors. When it is an accurate representation of actual behavioral control, and positive intentions to perform the behavior are present, perceived behavioral control is expected to be a good indicator of behavior implementation (Montano & Kasprzyk, 2002). However, Cochran and Mays (1993) argue that there are many determinants of sexual behavior that may cause a Black women with full condom use control to continue engaging in HRSB. Therefore, behavioral control should not be used as a sole predictor of behavior.

Intentions. There is a positive correlation between attitudes and intentions (Fishbein & Ajzen, 1975). As a person's attitude toward a behavior becomes more positive, their intention to act on the behavior will increase. On the other hand, a person with a negative attitude toward a

behavior will generally not intend to participate in that behavior. It assumed that, under their own volition, a person would carry out the behavior in which they intend to participate.

Montano and Kasprzyk (2002) write that attitudes, subjective norms, and perceived behavioral control are independent determinants of intentions. The determinants are expected to positively correlate with a young woman's intentions toward condoms. They also write that the intention to perform a behavior is moderated by perceived behavioral control. Thus, when a young woman's intention to use condoms is met with low perceived behavioral control, it is not a good indicator of condom use during sexual encounters.

Moreover, several researchers have found interesting relationships between intention and time. Albarracin, Johnson, Fishbein, and Muellerleile (2001) found that behavioral intentions have higher correlations with past behavior than with future behavior. In a similar manner, Bachrach and Newcomer (1999) found that women are more likely to report positive pregnancy intentions following the birth of a child than before childbirth. These findings suggest that women may manipulate self-reported intentions to coincide with their past HRSB.

In their aforementioned study of young adult African American men and women, Kiene et al. (2008) reported intention as a predictor of condom use (OR 2.39, 95% CI 1.40-6.54, $p < .001$). They also reported that intentions might change frequently. Even so, the authors discovered that daily variability in intention to use condoms was a predictor of daily condom use behaviors (OR 1.94, 95% CI 1.29-2.93, $p < .01$).

In another study of mostly Black women, ages 19-45, Bonacquisti and Geller (2013) found that participants' reports of desired and actual condom use were inconsistent (47% vs. 36%). Moreover, their reports of desire and actual consistent condom use were even more inconsistent (27% vs. 12%). Overall, 67% of study participants used condoms less frequently

than they intended (Bonacquisti & Geller, 2013). Causes of the disassociation between condom use intention and actual condom use behavior are plentiful.

Spontaneity may be one cause of engaging in HRSB despite one's intention to use condoms. Mosher et al. (2012) found that 20% of young women attribute their HRSBs to unexpected sexual encounters. Young women who engage in unplanned or spontaneous sexual intercourse do not always have immediate access to condoms. Yet, instead of waiting until a condom is available, they may decide to engage in HRSB.

Other causes of forfeiture of high condom use intention may be coercion or similar forms of sexual pressure by their partners. Of the 53 young women (Black = 20.8%), age 15-20, interviewed by Miller et al. (2007), 20.8% had been in relationships involving condom refusal ($n = 10$) and/or condom manipulation ($n = 5$) by their partners. In another study Miller et al. (2010) discovered that among Black young adult women, age 16-29, participants ($n = 359$), 25.9% had experienced pregnancy coercion and 27% experienced birth control sabotage. Through pregnancy coercion, young women may be forced to make conscious, though undesired, decisions to engage in HRSB. Conversely, in the case of birth control sabotage, young women may have every intention to use condoms, but they may be engaging in HRSB unbeknownst to them.

It is clear that the condom use intentions of young women may be negatively correlated with HRSB in some situations, yet not in others. Thus, the association between intention and HRSB should focus on the intention of both partners in the sexual relationship.

Use of TPB in sexual health interventions. Of the five *Compendium* (CDC, 2015a) interventions for young adult Black women, Female and Culturally Specific Negotiation (Sterk, Theall, & Elifson, 2003; Sterk, Theall, Elifson, et al., 2003) is the only intervention to utilize

TPB in its theoretical framework. However, no findings of TPB constructs were published. In a review of the Sister to Sister intervention, Jemmott, Jemmott, Hutchinson, Cederbaum, and O'Leary (2008) report use of TPB, although this theory is not identified as a component of the theoretical framework for either of the studies that report original findings of the intervention (Jemmott et al., 2007; O'Leary et al., 2008). What's more, O'Leary et al. (2008) do not report any measurements of TPB constructs among Sister to Sister study participants.

Conversely, TPB is not identified in the SiHLE theoretical framework, yet DiClemente et al. (2004) report findings of the attitude construct of TPB. The authors found that intervention participants had significantly higher condom attitude scores at six months ($p < .001$) and 12 months ($p = .008$) post-intervention, compared to the participants in the control group (DiClemente et al., 2004).

Although TPB does not have the widespread use of SCT among *Compendium* interventions for Black women, there is evidence of TPB's efficacy in other studies. In a meta-analysis of studies that incorporated TPB into their theoretical frameworks, Albarracin et al. (2001) found the theory to be an adequate model for predicting condom use. When comparing study participants of varying ages and STD risk levels who engaged in vaginal and non-vaginal intercourse with main partners and casual partners, the authors found that TPB is a good fit for prediction among all populations except for those that are at low-risk for STDs (Albarracin et al., 2001). Furthermore, Reid and Aiken (2011) found significant positive relationships among condom use and each construct of TPB: beliefs, attitudes, subjective norms, perceived behavioral control, and intentions. Additional evaluation of TPB constructs is warranted to support its use in HRSB interventions.

Use of TPB in text message interventions. As with traditional sexual health studies, the use of TPB in text message interventions is not as widespread as that of SCT. Still, TPB can be utilized in text message interventions (Cole-Lewis & Kershaw, 2010). Gold, Aitken, et al. (2011) and Gold, Lim, et al. (2011) are the only authors found to report use of TPB in a HRSB text message intervention in this review. However, as with most of the text message interventions utilizing SCT as their theoretical frameworks, the authors do not report any findings related to these constructs.

On the other hand, Jamison et al. (2013) did not identify TPB as an aspect of their theoretical framework, but they reported findings of condom use attitudes—a construct of TPB. Unfortunately, there were no treatment effects on this construct ($p = .17$). Juzang et al. (2011) included the TRA, the predecessor of TPB, in the theoretical framework for the 411 on Safe Text intervention. However, as with many other intervention studies, no findings of theoretical constructs were reported. To support its inclusion in the theoretical framework of future text message interventions, additional evaluation of TPB is needed among text message studies.

Use of TPB in the current study. Like SCT, TPB was included in the theoretical framework for the Sister to Sister intervention (Jemmott et al., 2008). While two of the intervention's goals contain constructs of SCT, the third goal contains constructs of TPB. This final goal of Sister to Sister is to bolster Black women's positive attitudes and beliefs associated with their sexual behaviors. As such, the TPB constructs of attitudes and beliefs are utilized in the conceptual model for the proposed research study. Although each of these constructs is important, it is the intention of a person and their actual behavioral control that ultimately predicts behavior. Since intention is a key factor in behavior prediction and change, this

construct will also be included in the conceptual model for the proposed study. Intentions will also be utilized as a dependent variable in the study.

The absence of subjective norms from the conceptual model is related to the individual nature of the study. As previously mentioned, subjective norms are based on the beliefs of referent others. As the proposed text message intervention does not aim to change the beliefs of these referent others, it would be inappropriate to assess for changes to participants' subjective norms. Perhaps future studies will implement the intervention among groups of friends or community members, and subsequently measure changes to subjective norms. This study, however, will focus on changes within each participant's control. Furthermore, perceived behavioral control, while not explicitly identified in the Sister to Sister curriculum (Jemmott & Jemmott, 2009), is closely related to SCT's self-efficacy. Since self-efficacy is included in the proposed conceptual model, it is unnecessary to also include perceived behavioral control.

Theory of Gender and Power

The Theory of Gender and Power (TGP) was developed by Connell (1987), and has been heavily cited by Wingood, DiClemente, and their colleagues (Wingood, Camp, Dunkle, Cooper, & DiClemente, 2009; Wingood & Diclemente, 1995, 2000). The theory notes the differences among men as women in various facets of society. It postulates that at the societal level, the combination of gender and power influences gender-based roles and the social norms that guide them (Wingood et al., 2009). Furthermore, at the institutional level, the structures of the theory are sustained through discriminatory practices, a disproportionate sense of control, and degradation of women in the media. According to Connell (1987), there are three intertwined structures of gender relations: labor, power, and cathexis. In each of these structures, a separation occurs based solely upon gender.

Labor. The allocation of certain jobs to specific groups of people is the most basic form of the sexual division of labor (Connell, 1987). Typically, men are given more skillful jobs, administrative jobs, and other higher paying jobs. Employers' rationalization of job differences was at one time based on different levels of education between men and women. As additional employees were hired, they were given the jobs of their same sex predecessors. Thus, a cycle of gender discrimination ensues (Connell, 1987).

The sexual division of labor is not only pervasive in the workplace, but it is also noted in non-paid labor, such as housework (Connell, 1987). The responsibility of both household chores and of childcare is typically seen as a woman's job. When men do take responsibility for caring for their children or helping to clean their home, they are seen by society as less manly as compared to men who work only outside of the home (Connell, 1987).

As the labor inequality between men and women increases, several exposures and risk factors place women in danger of contracting an STD. According to Wingood et al. (2009), exposures are the external variables that can influence a woman's sexual behavior, while risk factors are the internal variables that may influence a woman's sexual behavior. The economic exposures to adverse sexual health outcomes include living in poverty, having less than a high school education, and being unemployed or underemployed. The accompanying socioeconomic risk factors for poor sexual health outcomes include ethnic minority and young age (Wingood et al., 2009).

Power. As described by Connell (1987), power is an individual expression of the social order of gender relations, not an individual act of oppression. Using rape as an example of sexual power inequality, he writes that this behavior is often seen as an act of individual societal

deviance by the male perpetrator, yet it is actually an enforcement of a social order in which there are deep-rooted power imbalances and male supremacy dogmas.

Force is one component of power that is often used by men against women (Connell, 1987). The use of weapons and other forms of organized violence, for example, help men to maintain forceful control over women. This may include the threat of violence or actual violence related to a woman's desire not to participate in HRSB. The unequal use of or access to resources is another component of power (Connell, 1987). Given that men may sit in high administrative positions or may be tyrant heads of their households, women often gain access to only those resources that men allow. Access to or the allowed use of condoms during sexual intercourse can be a power tactic in a sexual relationship.

The connection between authority and masculinity is a main axis of the power structure of gender relations (Connell, 1987). Another, just as important, axis of power is the denial of authority to some groups of men. This denial of power is seen in the bottom tier of the gender-based hierarchy of masculinity: hegemonic masculinity, conservative masculinities, and subordinated masculinities. Historically, as men were given more authority, they were oftentimes seen as being more masculine. The more power a man had over his subordinates, the manlier he became and the higher up the masculinity hierarchy he rose. As women have become more liberated in their relationships, they have engaged in power struggles that make it difficult for men to sustain unequal power imbalances at home. Still as an affront to society, even when women are the dominant partners within the home, a public façade of a male-dominated relationship is maintained (Connell, 1987).

Like labor inequality, power inequality places women at risk for adverse sexual health outcomes (Wingood et al., 2009). Physical exposures to negative sexual health outcomes include

physical abuse, sexual intercourse with a high-risk partner, and limited access to preventative health care. Several behavioral risk factors for STDs are related to the sexual division of power. These risk factors may include inability to be assertive, inadequate condom use skills, low self-efficacy, and limited perceived control of condom use during intercourse (Wingood et al., 2009).

The condom use intention of the more powerful partner typically determines the condom use decision of the couple. As previously mentioned, young women may engage in HRSB because of their partners' negative attitude toward condoms (Daniels et al., 2013; Mosher et al., 2012; Sales et al., 2012). In these instances, the male partner is the partner with the greatest power. Similarly, Gakumo et al. (2012) found that, the relationship between condom use and women's positive attitudes toward condoms was weakened in the presence of sexual pressure ($p = .009$). Furthermore, Crepaz et al. (2009) identified power as one of the theoretical constructs that increases the efficacy of HRSB interventions among Black women. For this reason, women's perceived and actual power in the relationship should be taken into consideration when identifying facilitators of HRSB.

Among the young women in their study ($N = 290$, $M = 19$ years, Black = 3.8%), Buelna, Ulloa, and Ulibarri (2009) found a negative correlation between sexual relationship power and treatment for STDs ($p < .05$). However, the asymptomatic nature of some STDs may be a barrier to diagnosis. As such, the number of study participants who reported STD treatment may not have been consistent with the number of participants who actually had an STD. It may also be the case that they contracted the STD from a prior partner and not the partner involved in their most recent sexual relationship. This would negate the thought that current sexual relationship power is an accurate reflection on STD status. Still, according to Buelna et al. (2009), as young women are more empowered in their relationships, they are less likely to receive and

subsequently seek treatment for STDs. These authors suggest assessment of sexual relationship power dynamics in an effort to decrease women's risks of acquiring STDs.

Furthermore, Woolf and Maisto (2008) found no differences between men and women's presumed ability to negotiate condom use with a more powerful partner ($N = 203$, $M = 18.83$ years, female = 55.7%, Black = 6.62%). Study participants of both genders found it difficult to negotiate condom use in serious relationships. So, although men may be presumed to make all of the decisions about condom use, this may not be the case. According to Woolf and Maisto (2008), successful condom negotiation is associated with power, and not with gender.

Cathexis. The final structure of gender relations is cathexis, described by Connell (1987) as the social construction of sexuality. He writes that cathexis is a social structure that organizes the emotional attachments of one person to another. These complex emotional attachments can be affectionate or hostile. Laws such as those governing age of consent to sexual intercourse, homosexuality and same sex marriage, and rape are examples of the influence of social construction (Connell, 1987).

The organization of sexuality is based on a several major principles. One of these principles is that sexual intercourse should occur within the boundaries of a relationship (Connell, 1987). Intercourse outside of a committed relationship may be seen as a social disgrace. Young women who are engaged in these types of casual sexual encounters are often perceived as behaving in a manner that is less than ladylike. Conversely, men who engage in casual sexual encounters may be seen as macho, manly, or a "lady's man." When women speak of their enjoyment of sexual intercourse in casual relationships, they may be considered to be acting like men. Especially in cases of prostitution or adult entertainment, women are often seen as members of the lowest echelon of society if they are paid for being sexual (Connell, 1987).

One additional principle of cathexis is the notion that women's participation in heterosexual relationships is more about security than sexuality (Connell, 1987). Because men typically hold better jobs and more power, some see that it is advantageous for women to become involved in romantic relationships with men. Whereas men may become involved in romantic relationships for the benefits of a sexual partner, a mother for their children, or someone to handle the affairs of their household, women may be looking for the benefits of affection, a father figure, or someone to protect them from the inequalities of society (Connell, 1987).

Wingood et al. (2009) refer to Connell's structure of cathexis as the structure of affective attachments and social norms. They write that the social exposures associated with cathexis include conservative beliefs related to gender, mistrust of the healthcare system, and influences of referent others that do not encourage STD preventative behavior. They go on to write that the personal risk factors for social norms and affective attachment related to HRSB include limited STD prevention knowledge, negative beliefs of safe sex behaviors, and the perception of no vulnerability to STDs (Wingood et al., 2009).

Use of TGP in sexual health interventions. Three of the five *Compendium* (CDC, 2015a) interventions created for Black female participants utilize TGP in their theoretical framework (DiClemente et al., 2004; DiClemente et al., 2009; Sterk, Theall, & Elifson, 2003; Sterk, Theall, Elifson, et al., 2003). However, none of these studies report findings of TGP constructs. The gender-specific and ethnicity-specific nature of the other *Compendium* interventions described in chapter 2 makes TGP an appropriate theory to include in their theoretical frameworks. It is also an appropriate theory to be utilized by all other sexual health interventions created for women.

Use of TGP in text message interventions. None of the text message studies included in the chapter 2 literature review applied TGP or identified constructs of TGP in their frameworks. Nevertheless, its use in traditional sexual health interventions provides a basis for future use of TGP in sexual health text message interventions.

Use of TGP in the current study. Although it is a theory, TGP seems to be used more frequently as a philosophical underpinning. Many research studies use TGP to identify power imbalances between men and women or to justify the need for gender-specific interventions. This understanding is the foundation for the creation of a gender-specific intervention. In the current study, TGP is an important aspect of the theoretical framework and conceptual model. The TGP construct of power was expected to act as mediator of condom use intentions. As such, power was measured as a dependent variable. The study participants' perceptions of their own power within their sexual relationships was measured at baseline and follow-up. The results of these measurements are reported in chapter 6.

Summary

As the reach of mHealth interventions continues to widen, attention to the details of mHealth content creation and program evaluation will become increasingly important. In an effort to save valuable time and resources in mHealth programming, it is imperative that content is evidence-based and theoretically sound. The application of theoretical constructs in sexual health text message interventions will help to appropriately frame the educational content and provide a basis for intervention evaluation criteria.

SCT, TRA, and TGP address different influences of sexual behavior, yet each theory contributes to the effective nature of HRSB interventions. The inclusion of these theories in the theoretical frameworks of interventions for young adult Black women is supported by their use

in prior studies within this population. Although the use of theories in mHealth interventions is generally lacking, some mHealth researchers have used SCT and TPB as the foundation for their studies. Just as these are appropriate theories for use in mHealth research, TGP should have similar outcomes. Considering that TGP is a gender model, the platform used to implement the intervention should not affect the anticipated outcomes. Whether using traditional face-to-face methods or a more technologically savvy approach like text messaging, it is in the best interest of sexual health researchers to incorporate theories like SCT, TRA, and TGP into the conceptual models of their interventions.

The conceptual model used in this study is an expansion of Sister to Sister's theoretical framework. Each of the selected constructs was used in the design and evaluation of the intervention. The SCT, TPB, and TGP theories laid the foundation for the intervention's message content and activities. Self-efficacy, intention, and power were assessed for change among study participants. Finally, this study provides insights about the utility of the selected SCT, TPB, and TGP constructs for use in future mHealth interventions. Chapter 4 provides a description of the methods and findings of phase one of this study. In chapter 5, a more in-depth discussion of phase two methods is provided.

CHAPTER 4 - PHASE ONE METHODS AND RESULTS

This is the first phase of a two-phase, mixed-methods study designed to adapt, implement, and evaluate a text message version of Jemmott and Jemmott's Sister to Sister intervention (2009). The adapted version of the intervention is named "S2S." The name was selected as a way to pay homage to the Sister to Sister intervention through the use of a short, easily recognizable mnemonic, similar to those often identified in text messages (e.g. LOL [laughing out loud], IJS [I'm just saying], and TTYL [talk to you later]). This chapter presents the qualitative and quantitative methods utilized in the adaptation of Sister to Sister and the creation of S2S.

It was anticipated that each stage of the ADAPT-ITT model would be implemented sequentially, as recommended by Wingood and DiClemente (2008). However, in the midst of the intervention adaptation, it was decided by the dissertation committee that several stages should be repeated to increase the validity of the intervention. This decision was made via email communication with the study PI. Thus, the adaptation, production, and topical expert stages were implemented multiple times, in a cyclical fashion. This modified version of the ADAPT-ITT model will be presented in this chapter.

Although the ADAPT-ITT model was modified, it was imperative that phase one (assessment through training stages) be fully implemented prior to the initiation of phase two (intervention testing). This is because the results of phase one heavily influenced the methods of phase two. Therefore, comprehensive knowledge of phase one is necessary for a clear understanding of phase two. To increase the clarity of the study, both the methods and results of phase one are presented here. The methods and results of phase two are presented in chapters 5 and 6, respectively.

Methods

Specific Aim and Research Questions

Aim 1: Adapt the current Sister to Sister curriculum into 160-character S2S text messages.

RQ 1. Which sexual health content from the curriculum should be used in the text messages?

RQ 2. How can STD information be incorporated into the new curriculum?

RQ 3. What types of skill-building exercises can be incorporated into the new intervention?

RQ 4. How frequently should S2S text messages be sent?

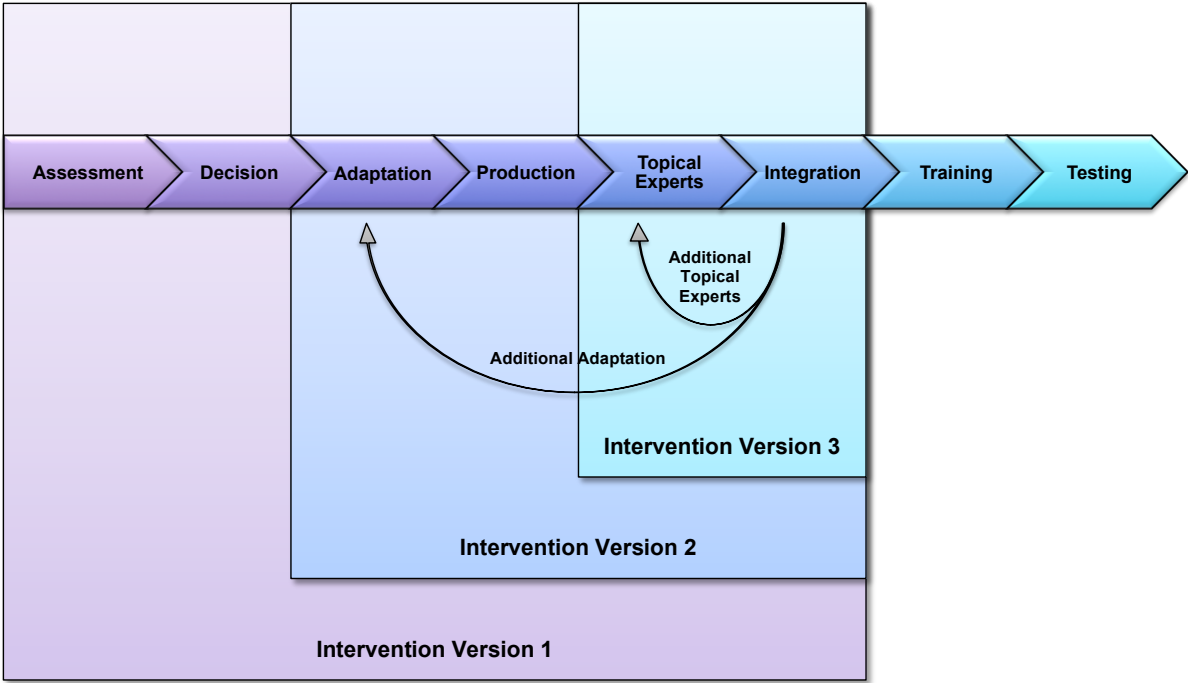
RQ 5. What is an appropriate duration for the S2S intervention?

Procedures

In phase one of this study, the adaptation, production, topical experts, integration, and training stages of the ADAPT-ITT model were implemented. A Research Advisory Board (RAB) was recruited to participate in the intervention adaptation and production stages. Then, a draft of S2S was presented to topical experts from the dissertation committee. Recommendations from the committee were integrated into a second draft of intervention. Next, a revised copy of S2S was presented to a focus group of young adult Black women and topical experts from an established HIV community advisory board (CAB). Each of these groups provided recommendations that were integrated to a third draft of the intervention. This draft of S2S was assessed for literacy and presented to the dissertation committee for final approval. The ADAPT-ITT stages and the order in which they were implemented are presented in Figure 4.1 as a modified version of the original model.

Figure 4.1

Modified ADAPT-ITT Model



Assessment. An assessment of high-risk sexual behavior (HRSB) among young adult Black women and appropriate interventions to address this problem were performed through a comprehensive review of the literature as reported in chapter 3 of this dissertation.

Decision. The comprehensive literature review, which was conducted during the assessment stage, led to the decision to adapt the Sister to Sister intervention. As discussed in Chapter Three, this particular intervention was selected for adaptation because of its brief, evidence-based nature.

Adaptation. Following proper screening and consent, RAB members were invited to attend several meetings. Each RAB meeting was modeled after the CAB meetings utilized in community-based participatory research (CBPR). The first RAB meeting involved theatre testing, in which participants observed a demonstration of the Sister to Sister intervention. A

women's health nurse practitioner and one of the study research assistants (RAs) participated in the demonstration. This was followed by a semi-structured discussion on the manner in which the intervention could be adapted into a text messages. In subsequent meetings, RAB participants developed the S2S text message intervention and the control group messages. The messages, which are discussed in detail later in this chapter, include various content areas and multimedia. RAB participants also provided input on recruitment and retention strategies, and gave feedback on the online surveys administered during phase two.

Production. A draft of S2S was created over the course of five RAB meetings. The goals of the original Sister to Sister intervention, as stated in chapter 3 of this dissertation, were maintained during the production of the newly adapted intervention. RAB discussions influenced the design of various graphics that were included in the final S2S intervention. A graphic designer adapted several memes, pictures, and short video clips (e.g. less than 90 seconds) from the original Sister to Sister curriculum. Each graphic was created specifically for transmission via text message. Thus, they were appropriately sized and colored for optimal viewing on mobile phones.

Topical Experts. Instead of utilizing one expert panel, two expert groups were invited to review the S2S text message intervention. The first group of topical experts to review the newly adapted intervention was the dissertation committee. Feedback was provided regarding the length and content of the intervention. It was then revised accordingly.

Integration. Dissertation committee recommendations led to message addition and elimination, verbiage changes, and multimedia modifications. While feedback from these topical experts was valuable, it was imperative that the recommendations were feasible for a text message intervention. It was also important that the integrity of the original Sister to Sister

intervention was not lost in the newly adapted S2S intervention. Throughout this process, the core components of the Sister to Sister intervention were maintained. The integration phase resulted in a second draft of S2S.

Additional adaptation. Following proper screening and consent, eight young adult Black women were recruited to participate in a one-time-only focus group meeting. In this meeting, they observed the original Sister to Sister intervention (theatre testing), reviewed the second draft of the S2S text message intervention, and discussed their views of the new text message intervention. Intervention changes recommended by the focus group participants included the addition of a new video clip and supplementary STD education. These recommendations were discussed with the dissertation committee prior to any intervention changes.

Additional topical experts. The second draft of S2S was also presented to the UCLA Center for HIV Identification, Prevention, and Treatment Services (CHIPTS) CAB. Attendees of the CAB meeting included HIV researchers, CHIPTS staff members, and representatives of local community health organizations ($n = 20$). The CAB provided feedback on the intervention messages and multimedia, as well as potential changes to phase two research methods. One CAB recommendation mirrored the need for supplementary STD education that was highlighted during the focus group meeting. An outdated STD statistic in one of the video clips was also identified. As with the recommendation of the focus group, the recommendations of the CAB were discussed with the dissertation committee prior to making any changes to the S2S intervention.

Final integration. Upon approval of the dissertation committee, some recommendations of the focus group and CAB were applied to the final S2S intervention draft. This approval

allowed for production of an additional video clip and creation of new message verbiage. The overall differences between the first draft of the intervention and the final draft were vast. Whereas the first draft was a 12-week intervention, the final version was only eight weeks. And, whereas the first draft included 36 text messages, the final version included only 24 messages. The final draft of the intervention also included more multimedia than the first draft. Each type of multimedia is discussed in detail in the results section of this chapter.

Training. Various messaging platforms were assessed for potential delivery of the S2S messages. EZ Texting (www.eztexting.com) was selected as the messaging platform and Vimeo (www.vimeo.com) was chosen to host the intervention videos. The PI learned to navigate these platforms and set up a test run of the intervention and control messages. This test run was conducted with the PI and research assistants (hereafter referred to as the study team), four RAB participants, and the dissertation chair. The purpose of the test run was to gain experience using the platform with the text messages and to evaluate its ability to effectively deliver the messages.

Testing. The final step of the model was implemented in phase two of this study. Phase two methods and results are discussed in chapters 5 and 6, respectively.

Study Setting

RAB and focus group meetings were held in the conference room of a Los Angeles County community health organization. During the meetings, the conference room doors remained closed to maintain privacy. In total, five RAB meetings were held. The RAB participants met every one to two weeks, until the intervention was fully adapted. The meetings lasted approximately three hours. The same community health organization provided a site for the two hour, one-time-only focus group.

All RAB meetings were held on Saturdays, except for one meeting that was conducted on Friday because of a conflict with a national holiday. At least four young women (57.14%) participated in each RAB meeting, except the fourth meeting, during which only one participant was in attendance. Instead of canceling that meeting, the participant and the PI had a one-to-one, interview-style discussion.

All RAB meeting attendees appeared in-person for the first two meetings. Following the second meeting, however, several participants left the Los Angeles County for summer break. This temporary change in residence was unanticipated in the original study design. The location change was addressed by using video conferencing for all subsequent meetings, which was mutually agreeable for all participants and the study team. RAB participants who remained in Los Angeles County attended the meetings in-person, while all participants who left the area attended the meeting via Google Hangout.

The one-hour meeting with the dissertation committee was held on the UCLA campus. Email communication with the committee also occurred, as needed. The CAB met in the CHIPTS conference room. Although the CAB meeting lasted just under two hours, the dialogue regarding the S2S intervention was only about 30 minutes. During the remainder of this meeting, the CAB observed a presentation by a CAB member and discussed this member's current research study.

Sample Size

Typically, there are four to 12 participants in a focus group (Parker et al., 2012; Plummer-D'Amato, 2008a; Rabiee, 2004). It is recommended that researchers recruit two to four or 10-25% more participants than needed for each focus group in case some participants are not in attendance (Plummer-D'Amato, 2008a; Rabiee, 2004). As it relates to adaptation methods,

Wingood and DiClemente (2008) suggest the recruitment of 15 participants for theatre testing. However, other authors have conducted theatre testing among groups of unspecified sizes (Davidson et al., 2014; Sullivan et al., 2014).

The recruitment goal for both the RAB and focus group was to recruit eight young adult Black women to participate in each group. This way, even with a potential attrition rate as high as 50%, no less than four participants were expected at each RAB or focus group meeting. With four participants as an acceptable number for a focus group session, the recruitment of eight RAB and eight focus group participants was established as a goal.

Inclusion and Exclusion Criteria

Inclusion and exclusion criteria were the same for RAB and focus group participants. The criteria were assessed using self-report methods. Inclusion criteria included self-identified: 1) Black ethnicity, 2) female gender, 3) age 18 to 24, 4) sexual intercourse in the past 3 months, and 5) owner of a mobile phone with text messaging capabilities. Inclusion criteria were chosen to ensure that study participants were representative of the target population.

Exclusion criteria included: 1) being married, 2) planning to become pregnant within the next year, and 3) sharing a mobile phone with another person. Exclusion criteria were chosen to prevent recruitment of young women who may not be open to using condoms and whose participation in a text messaging intervention may jeopardize their privacy.

Participant Recruitment

Sampling for research using focus groups is purposive (Plummer-D'Amato, 2008a; Rabiee, 2004). As such, participants are selected based on their suitability for the study and their availability during the study (Parker et al., 2012). This type of sampling was also utilized for

RAB recruitment. In order to recruit phase one participants, hard-copy (paper) and soft-copy (digital) recruitment flyers were distributed by the study team using various delivery methods.

The study team consisted of the primary investigator and two paid research assistants (RAs). Both RAs were pre-licensure nursing students at the University of California, Los Angeles. The entire study team completed the Human Research, FDA Regulated Research, and UCLA HIPAA trainings offered by the Collaborative Institutional Training Initiative (CITI Program).

Hard-copy flyers were placed in a number of Black-owned hair salons in Los Angeles County. Soft-copy flyers were posted on the study team's Facebook and Twitter pages. Their Facebook friends and Twitter followers were asked to share and retweet the posts. The flyer was also posted in the personals section of the Los Angeles Craig's List website. Additionally, recruitment flyers were emailed to personal contacts of the study team. Lastly, the snowballing method of recruitment was utilized.

Currently enrolled RAB participants received email with the recruitment flyer attached. They were asked to share the flyer with their email contacts. Each flyer listed the inclusion criteria, participant incentives, and the contact information. During recruitment of the RAB, the participant incentives were increased from \$20 to \$50 in an attempt to attract more potential participants. Consequently, the recruitment flyer was revised.

Recruitment of the focus group participants was similar to RAB recruitment. Hard-copy flyers were distributed in the city of Los Angeles, at a shopping mall and in a public parking lot. Soft-copy flyers were posted on the study PI and RA's Facebook and Twitter pages, and in the community section of the Los Angeles Craig's List website. Additionally, one Facebook advertisement and one Twitter advertisement were purchased. The advertisements targeted Black

young adult women, ages 18 to 24, residing in Los Angeles County. The advertisements were created to run for 11 days on Facebook and seven days on Twitter.

The focus group recruitment flyer was also emailed to RAB participants, as well as Black Student Union (BSU), African Student Union (ASU), and National Pan-Hellenic Council (NPHC) sororities at colleges and universities in Los Angeles County. Each email requested that the recipient forward the recruitment flyer to their email contacts. Moreover, upon her enrollment in the study, a recruitment flyer was emailed to each focus group participant. The participants were asked to share the flyer with their friends, family, and colleagues. As with the RAB recruitment flyer, the focus group recruitment flyer listed the study inclusion criteria, participant incentives, and contact information. Copies of the RAB and focus group recruitment flyers are in Appendix A.

Screening and Consent

Young women who were interested in participating in the RAB or focus group were screened for eligibility and consented during a brief telephone interview with the PI. A script was utilized to ensure consistency of screening among all potential study participants. Screening began with a brief synopsis of the research study. Potential participants were then asked about their gender, age, ethnicity, mobile phone use, and marital status. The screening was phrased sequentially so that the least sensitive questions were asked first. Copies of the RAB and focus group screening tools are in Appendix B.

If, upon completion of the screening, the young woman was eligible for study participation, and if she was still interested in participating in the study, she was verbally consented. To maintain anonymity, study participants were not asked for any identifying

information other than their email addresses. A copy of the consent form was emailed to each participant. Copies of the RAB and focus group consent forms are in Appendix C.

Data Collection

Qualitative data were collected during RAB and focus group meetings. The PI and RAs took handwritten notes during each meeting that described the major points of the discussion. Discussions were also recorded using two Olympus digital recording devices. A reputable local transcription company was hired to transcribe the recordings. The primary purpose of the transcripts was to provide written documentation of meeting discussions. This documentation gives assurance that the intervention adaptation was based on the recommendations of the RAB, and not solely those of the study team.

Both qualitative and quantitative data were collected using online surveys. RAB and focus group participants completed the socio-demographic surveys on their own time, away from the RAB and focus group meetings. These surveys were sent to all RAB and focus group participants following the first RAB meeting and the one-time-only focus group. Conversely, only the RAB participants completed the modified QQ-10 survey, described below. This survey was completed between the second and third RAB meetings.

Meeting data. A large portion of the study's qualitative data was collected from semi-structured discussions held during RAB and focus group meetings. Topic guides, adapted from Weinreich (2011), were used to help facilitate these meetings. These guides contained questions and prompts to help participants engage in meaningful and productive discussions. An example of questions and prompts from the RAB Meeting #1 topic guide include:

1. What was the most important thing you learned from the intervention? Prompts: What was your favorite part of the intervention? What was most memorable about the intervention?
2. What aspects of the intervention leads to text messaging? Prompts: What about this intervention makes it the right type of program to be adapted into a text message intervention? What about this intervention makes it a challenging program to be adapted into a text messaging intervention?
3. During the demonstration of the intervention, Nurse Practitioner Cheryl read from the curriculum booklet. What do you think about the way she communicated with Stephanie? How would you feel if she were saying those things to you in text messages? Prompts: Was any of the content embarrassing? Was there anything she said that would make you feel uncomfortable if you were reading it?

A copy of the topic guides from the first RAB meeting and the focus group are in Appendix D.

Online surveys. The online survey platform Survey Monkey was used to collect data from online surveys. This method of data collection is widely used among researchers. In a review of 750 Institutional Review Boards (IRBs), 94% of respondents reported the most frequently reviewed IRB applications were those utilizing online surveys (Buchanan & Hvizdak, 2009).

The literacy level of each survey was assessed using the Flesch Reading Ease and Flesch-Kincaid Grade Level tests. The Flesch Reading Ease test measures readability on a scale from 0 to 100. The high score indicate easy readability. A score between 60 and 70 is recommended. The Flesch-Kincaid Grade Level test measures the U.S. grade level at which one should be able

to easily read the document in question. While a fourth grade reading level is recommended by Wingood and DiClemente (2008), a seventh to eighth grade reading level is recommended by the Flesch-Kincaid Grade Level test. Based on the adult nature of the sexual health content included in this study intervention, it was decided to use verbiage that met an eighth grade reading level. Both the Flesch Reading Ease and Flesch-Kincaid Grade Level literacy scores for each survey were calculated using Microsoft Office software.

Socio-demographic data. RAB and focus group participants were asked to complete a short socio-demographic survey. The data collected from this survey were only used to provide a description of the study participants. None of the participants' socio-demographics were utilized as study variables for phase one.

Survey items included information related to the young women's age in years and employment status (i.e. unemployed, looking for employment, or hours of employment), as these socio-demographic areas were assessed in the original Sister to Sister study (Jemmott et al., 2007). They were also asked about their highest level of education (i.e. high school, some college, or college degree), number of previous pregnancies, types of previous STD diagnoses, and timing of last sexual encounter (i.e. past week, past three months, or past year). The phase one socio-demographic survey has a Flesch Reading Ease score of 69.6 and a Flesch-Kincaid Grade Level of 4.9. A copy of this socio-demographic survey is in Appendix E.

Modified QQ-10. Developed by Moores, Jones, and Radley (2012), the QQ-10 is a 10-item instrument that measures the acceptability of clinic-based quality of life surveys. It was used to evaluate RAB participants' beliefs about the acceptability of the instruments that were used to analyze outcomes in phase two. These measures are described in Chapter Five. The original QQ-10 item pool was derived from focus groups findings. It was then tested on 265

women who had completed the electronic Personal Assessment Questionnaire, Pelvic Floor (Moore et al., 2012). The instrument is comprised of two subscales: a six-item value subscale (Cronbach's $\alpha = .76$) and a four-item burden subscale (Cronbach's $\alpha = .74$). Both subscales were used for this study.

With permission of the instrument creator, the PI modified several items on the QQ-10 value subscale to better reflect the sexual behavior content of the phase two survey. The modified QQ-10 value subscale items include: *1. The questionnaire helped me to communicate about my thoughts on sexual relationships, 2. The questionnaire was relevant to me, and 3. The questionnaire was easy to complete.* No items from the burden scale required modification. The items in the QQ-10 burden subscale include: *1. The questionnaire was too long, 2. The questionnaire was too embarrassing, 3. The questionnaire was too complicated, and 4. The questionnaire upset me.* The modified QQ-10 has a Flesch Reading Ease score of 57.7 and a Flesch-Kincaid Grade Level of 7.6.

QQ-10 also includes three open-ended questions. Like some of the items in the values subscale, the wording in the open-ended items was modified to reflect the content of the survey. The modified open-ended items are: *1. Do you have any comments or suggestions on how the questionnaire you used could be improved (e.g. its structure, appearance or design)? 2. Were any of your important thoughts, problems or concerns missed out by the questionnaire you used? and 3. Do you feel that any areas or problems in the questionnaire you used were over-represented?*

Typically, there is no scoring of the QQ-10. For this study, however, the QQ-10 responses were reflected using a five-point Likert scale. The available participant responses and their corresponding scores were: strongly agree (5 points), agree (4 points), neutral (3 points),

disagree (2 points) and strongly disagree (1 point). Scoring was achieved by adding the points associated with each item response. For most modified QQ-10 items, scores are positively correlated with instrument acceptability. However, items seven through 10 are negatively correlated with instrument acceptability. As such, these items are reverse-coded. When assessing the overall score of the modified QQ-10, the highest possible score is 50 and the lowest possible score is 10. A copy of the modified QQ-10 is in Appendix F.

Message Feasibility. Data for message feasibility were collected from reports on the EZ Texting online text-messaging platform and the Vimeo video streaming platform. Text message reports generated data on the delivery status of each message. For each participant, text messages were reported as delivered, no data, or bounced. Delivered messages were defined by the platform as messages that were received by the intended recipient with no issues. Messages with no data were defined as those with missing message receipts from the mobile service provider. Bounced messages were defined as those that were not received by the intended recipient.

The text-messaging platform also provided data on the number of times each intervention video link was clicked. Because video messages could not be sent directly from the message platform, each video was uploaded to Vimeo and a specialized shortened link was created. In all, seven links were created; one for each video. Clicking on these links was the only way for message recipients to view the intervention videos. The videos were posted on a private Vimeo webpage that prohibited video downloads or posting comments.

The study PI tested each message link to ensure that message recipients would be redirected to the correct webpage and to ensure the accuracy of link reports. She found that each time she clicked the link, the number reported increased by one. Thus, link reports were accurate. PI-initiated test link clicks are not included in the test run data reported in the results section.

Data from the video streaming platform were reported as *loaded*, *played*, and *finished*. Loads were defined by allowing the private video webpage to upload onto the mobile phone. In order for a video to load, the associated text message link had to be clicked. Plays were defined by clicking to play button on the video. Finishes were defined by watching the entire video through completion.

The study PI tested each video to ensure the accuracy video reports. She found that although reports of video loads and plays were accurate, reports of video finishes were not. This was noted after watching an entire video, yet noting no increase in the number of reported finishes for this video. As such, the number of video loads and plays were used as a more accurate representation of the number of videos watched than the number of video finishes. PI-initiated test loads, plays, and finishes are not included in the test run data reported below.

Text messages reports could only determine the number of messages delivered, and not whether text messages were opened or read by message recipients. These reports also did not identify which participant clicked on each video link. Similarly, video steaming reports did not identify which message recipients loaded, played, or finished each intervention video. Thus, there was no way to determine whether or not videos were watched multiple times by one message recipient or watched one time by multiple message recipients.

Data Analysis

Quantitative data analysis of the phase one socio-demographic survey, Modified QQ-10, and test run feasibility were analyzed using SPSS version 23 and SASS version 9.4. The findings of these surveys will be presented later in this chapter as descriptive statistics (i.e. means and standard deviations, frequencies, and percentages).

Qualitative data from the RAB and focus group meetings, as well as that of the open-ended items on the modified QQ-10, were analyzed by the PI using qualitative content analysis (QCA). This is a method of analyzing written data, such as short-answer responses, newspaper articles, and transcripts. Its use in health research has grown exponentially in the past 30 years (Hsieh & Shannon, 2005). Two types of content can be analyzed using QCA: manifest content and latent content. Manifest content helps qualitative researchers to understand what the text says, while latent content allows them to understand the meaning of the text (Graneheim & Lundman, 2004). This study focused on the analysis of manifest content only.

According to Graneheim and Lundman (2004), manifest content is presented in categories. These categories serve as descriptive threads, seen throughout the text. They provide answers to the question of “what is being said?” Findings from meeting transcripts and qualitative data from survey open-ended items are presented as categories. Direct quotes from RAB and focus group participants are used to support each category.

Study Trustworthiness

As the first phase of this study involved mostly qualitative methods, extra care was taken to increase the trustworthiness of the study. There are four aspects of trustworthiness—dependability, credibility, transferability, and confirmability (Plummer-D'Amato, 2008b). Each component of trustworthiness is discussed below, along with the ways in which any potential threats to trustworthiness of the study were minimized.

Dependability. Dependability is an aspect of trustworthiness that evaluates the consistency of data interpretation (Plummer-D'Amato, 2008b). To minimize threats to dependability of the study, the research team independently reviewed the RAB and focus group recordings and transcripts for accuracy. There were no inconsistencies. In addition, an audit trail

was implemented to further increase the dependability of the study (Plummer-D'Amato, 2008b; Rabiee, 2004). This documentation includes all of the recorded data, original transcripts, corrected transcripts, and meeting notes.

Credibility. The second aspect of trustworthiness deals with the representativeness of the participants' experiences (Plummer-D'Amato, 2008b). Researchers utilizing group meetings for data collection should understand the importance of social interaction among the group members (Parker et al., 2012; Rothwell, 2010). For instance, an overbearing participant can threaten credibility by dominating the conversation and consequently biasing the data (Betts, Baranowski, & Hoerr, 1996; Rothwell, 2010).

Increasing the number of group meetings ensures that qualitative studies can self-correct biased data. With more meetings the researcher can collect and compare a larger amount of data and remove biased or outlying data from the study findings (Betts et al., 1996). In this phase of the study, multiple meetings were held among the RAB participants, whereas the one-time-only focus group was conducted among a different group of participants. To prevent an overbearing participant from influencing discussion findings, each young woman was encouraged to share her thoughts and feedback. When the PI felt that one participant was overshadowing the others, the goal of hearing all views in the group was emphasized. At times, the PI specifically called on less outspoken RAB and focus group participants. The young women were also reminded, at the beginning of each meeting and sometimes during the discussion, that there were no right or wrong answers, and that negative comments were welcomed.

Another way to strengthen the credibility of a study is through a review of the findings with the focus group participants (Creswell, 2013; Plummer-D'Amato, 2008b). This allows the participants to provide additional feedback and clarification of their responses, if needed. RAB

participants had the opportunity to provide real-time feedback related to the development of the new text message intervention. The PI consistently asked for clarity and consensus of ideas throughout each meeting. At the end of each meeting, she summarized the group's findings and ensured group consensus. Then, at the beginning of the subsequent meeting, the PI would review notes from the prior meeting. This helped to solidify the accuracy of the meeting notes.

One additional method of strengthening credibility is to utilize an observer who takes notes during focus groups to provide a more complete analysis of the group's interactions (Plummer-D'Amato, 2008b; Rabiee, 2004). In this study, at least one RA was in attendance at each RAB meeting, and both RAs attended the focus group. Their meeting notes were used as a supplement to each RAB and focus group transcript.

Transferability. The third aspect of trustworthiness determines the ability of the study findings to be generalized to a similar group (Plummer-D'Amato, 2008b). The transferability of data collected during group meetings may be difficult to achieve, as the number of participants in each group and the number of different groups in each study are generally not very large (Betts et al., 1996). This aspect of trustworthiness can be strengthened by increasing the number of distinct groups that meet throughout the study (Betts et al., 1996). Following the conclusion of the RAB meetings and adaptation of the Sister to Sister intervention, a focus group was recruited to vet the findings of the RAB. The use of this group helped to strengthen the trustworthiness of the RAB's findings.

Moreover, providing a rich description of study participants strengthens trustworthiness by allowing others to determine whether the study results are applicable to their own practice setting (Creswell, 2013; Plummer-D'Amato, 2008b). Thus, it was important to collect socio-demographic data from the study participants. This data helped to understand the similarities and

differences of the participants within the RAB and focus group. It also helped to determine if the women who helped to adapt the intervention were representative of the study sample for phase two. Lastly, it can help other researchers and clinicians who may want to implement S2S among similar populations.

Confirmability. The final aspect of trustworthiness is the extent to which the study findings are based on the actual data collected and not on the researcher's biases (Plummer-D'Amato, 2008b). Disclosure of information about the researcher can help to strengthen confirmability (Creswell, 2013; Plummer-D'Amato, 2008b). In qualitative data, this disclosure is often referred to as reflexivity (Plummer-D'Amato, 2008b). To reduce any threats to the confirmability of this study, the PI wrote summary notes of each meeting. These notes allowed the PI to be reflexive about the meeting findings and her personal biases.

An audit trail can also help to strengthen the confirmability of the study (Plummer-D'Amato, 2008b; Rabiee, 2004). As previously mentioned, an audit trail was maintained throughout this study.

Human Subjects

All study procedures were approved by the University of California, Los Angeles South General Institutional Review Board (IRB#14-001800). Study participants received lunch at the beginning of each RAB and focus group meeting. They also received a \$50 gift card at the completion of each meeting.

Any information that was obtained in connection with this study and that identified participants remained confidential and, as per IRB policy, would be disclosed only with participants' permission or as required by law. Confidentiality was maintained by removing all personal identifiable information from the RAB and focus group transcripts. Meeting recordings

were kept on digital recorders, which were locked in a file cabinet. Once the study was complete, all recordings were destroyed.

In addition to the PI maintaining participants' confidentiality, study participants were also asked to maintain the confidentiality of the study. As part of their consent, participants agreed to keep their study participation private. During each meeting, they were also reminded to keep meeting discussions confidential.

At any time, participants could choose whether or not they wanted to be involved in the study. They knew that they could withdraw consent and discontinue participation at any time, for any reason. Participants were also informed that they could refuse to answer any survey items they may have felt uncomfortable answering, and still remain in the study.

Results

The results of the RAB and focus group meetings, dialogue with the dissertation committee and the CHIPTS CAB, and a test run of the intervention are presented here. These data represent the final outcomes of the adaptation through training stages of the modified ADAPT-ITT Model.

Participant Recruitment

Phase one RAB recruitment occurred between January 2015 and April 2015. All but one RAB participant ($n = 6$) were recruited via email and snowballing. The remaining RAB participant was recruited via Facebook. Likewise, phase one focus group recruitment occurred during August 2015. One focus group participant was recruited via Facebook. The remaining participants ($n = 4$) were recruited via email and snowballing. None of the participants were recruited via hardcopy flyers, Twitter, or Craig's List.

Participant Socio-Demographic Characteristics

Of the eight young adult Black women who were screened and consented for participation in the RAB, seven participants attended the first RAB meeting. The participant who did not attend the first RAB meeting was not informed of subsequent meetings. No socio-demographic information was collected from this young woman. Likewise, eight young adult Black women were screened and consented for participation in the focus group. However, only five of these women attended the focus group. Socio-demographic information was requested from the five participants in attendance, though only four participants completed the survey. Thus, the socio-demographic characteristics presented here represent seven RAB participants and four focus group participants.

There were no significant differences between the socio-demographics reported by the RAB participants and those reported by the focus group participants. To maintain consistency with reports by the CDC, age categories were separated into 18 – 19 years ($n = 4$) years and 20 – 24 years ($n = 7$). The slightly lower age of the RAB participants ($M = 20.57$ years) in comparison to the age of focus group participants ($M = 21.5$ years) is consistent with their report of less college education, compared to the education level of the focus group participants. Only one RAB participant reported having some college, compared to three of the focus group participants.

Five RAB participants (45.5%) reported their highest level of education as *high school degree or equivalent*, while three (27.3%) focus group participants reported their highest level of education as *some college, but no degree*. It should be noted that there was a clear discrepancy between the self-report of the RAB participants and the reality of their educational experience. This was determined in casual conversation, during which four RAB participants spoke about their current experiences as undergraduate college students, despite reporting their highest level

of education as high school. The education item on the demographic survey was written as follows: “*what is the highest level of school you have completed or the highest degree you have earned?*” Based on all of the available responses, it was assumed that undergraduate college students would select *some college, but no degree*. The undergraduate students may have selected the high school degree option in haste, without reading all of the available options. Or, they may have selected this option because they felt it was the most accurate representation of their current education level.

For added clarity, the *some college, but no degree* and the *associate’s degree* categories of the socio-demographic survey were collapsed into the newly created *some college, but no bachelor’s degree* category. This decision was made because of the small number of participants with an associate degree ($n = 1$). No phase one participants had received a graduate degree.

Two phase one participants (18.2%), one from the RAB and one from the focus group, appear to be employed with full-time jobs. However, these participants may have been employed with multiple part-time jobs, as they only reported working 40 or more hours per week and not the number of jobs at which they were employed. Five participants (45.5%), three from the RAB participants and two from the focus group, reported working part-time jobs. The *not employed, looking for work*; *not employed, not looking for work*; and *disabled, not able to work* categories were combined to create a new *unemployed* category. Four participants (36.4%) were unemployed, including three from the RAB and one from the focus group. No phase one participants reported the inability to work because of a disability.

Five participants (45.5%) reported having previous pregnancies and/or STD diagnoses. Among these participants, the number of previous pregnancies reported ranged from one pregnancy to three pregnancies per participant. All but one of the young women who reported a

history of pregnancy also reported a history of chlamydia ($n = 3$). Furthermore, one participant reported prior diagnoses of both chlamydia and gonorrhea. These findings suggest that at least 45.5% of the phase one participants had previously engaged in HRSB, as indicated by past pregnancy history (36.4%) or prior STD diagnosis (36.4%).

Three of the phase one participants (27.3%) reported having sexual intercourse within one week prior to completing their socio-demographic survey. All other participants reporting having sexual intercourse within the past three months. Combined socio-demographic characteristics of all phase one participants are displayed in Table 4.1. Comparisons of socio-demographic characteristics of RAB participants and focus group participants are displayed in Table 4.2.

Table 4.1

Combined Socio-Demographic Characteristics of Phase One Participants

Socio-Demographics	Number (<i>n</i> = 11)	% ^a
Mean Age (Standard Deviation)	20.91 (2.34)	
18 – 19 years	4	36.4
20 – 24 years	7	63.6
Education Completed		
High school degree or equivalent	5	45.5
Some college, but no bachelor degree	4	36.4
Bachelor degree	2	18.2
Employment		
Employed, working 40 or more hours per week	2	18.2
Employed, working 1 - 39 hours per week	5	45.5
Not employed, looking for work	2	18.2
Not employed, NOT looking for work	2	18.2
Prior Pregnancy		
Yes	4	36.4
No	7	63.6
Prior STDs		
Yes	4	36.4
No	7	63.6
Last Sexual Intercourse		
Past Week	3	27.3
Past Three Months	8	72.7

^a Percent totals may not sum to 100 due to rounding.

Table 4.2

Individual Socio-Demographic Characteristics of RAB and Focus Group Participants

Socio-Demographics	RAB (<i>n</i> = 7)		Focus Group (<i>n</i> = 4)		<i>p</i>
	Number	% ^a	Number	%	
Mean Age (Standard Deviation)	20.57 (1.02)		21.5 (.87)		.19
18 – 19 years	4	57.1	-	-	
20 – 24 years	3	42.9	4	100	
Education Completed					.06
High school degree or equivalent	5	71.4	-	-	
Some college, but no bachelor degree	1	14.3	3	75	
Bachelor degree	1	14.3	1	25	
Employment					1.00
Employed, working 40 or more hours per week	1	14.3	1	25	
Employed, working 1 - 39 hours per week	3	42.9	2	50	
Not employed	3	42.9	1	25	
Prior Pregnancy					1.00
Yes	3	42.9	1	25	
No	4	57.1	3	75	
Prior STDs					1.00
Yes	3	42.9	1	25	
No	4	57.1	3	75	
Last Sexual Intercourse					1.00
Past Week	2	28.6	1	25	
Past Three Months	5	71.4	3	75	

^aPercent totals may not sum to 100 due to rounding.

Text Messages

Prior to adapting Sister to Sister into text messages, it was important to understand the target population's thoughts on text messaging. Thus, RAB participants were asked to share their thoughts on text messaging, in general, and automated text messages, more specifically.

Confirmatory head nods and affirmative statements, such as “yeah” or “um hmm,” were used to support group consensus. Pseudonyms are utilized to protect participants' privacy.

RAB participants generally liked text messages. As Faith stated, “It's convenient. We're always checking our phones.” Brooklyn agreed with this notion in her statement, “You can go back and look at it if you forgot. Oh, what day did they send it? Alright, I'll check my texts.”

Ava also agreed that text messages are convenient. As she put it, “I just feel like everyone has their phone in their hand all the time, so it’s like the easiest way to, like, contact someone.”

Each RAB participant had previously received automated text messages. Many of these messages were sent from large retailers, such as Victoria’s Secret. When asked what they liked and disliked about automated text messages, there was a consensus related to their ability to control receipt of the messages. As Brooklyn said, “I like, um, that there’s a stop option. Like, if you don’t want to receive the texts anymore, you text ‘stop’ and then, they don’t send them anymore.”

There was also consensus among RAB participants that frequent automated messages can be annoying. Charlotte made this point clear when she said, “Sometimes they happen, like, really often, and you’re like ‘okay, I get it, I get it, I get it.’ So like, like making them more spread out would be, like, better.” In like manner, Emma stated, “I don’t mind automated messages. But, like, when it’s, like, too frequent – I would say is the annoying part.” To prevent participants from stopping automated text messages or becoming annoyed with the messages, RAB participants worked diligently to select appropriate message content, format, and timing.

S2S Intervention

The core components of the S2S intervention are organized into three distinct categories: message content, message format, and message timing. Several verbatim statements of RAB and focus group participants help to substantiate the intervention adaptation. These statements are presented in Table 4.2, Table 4.3, and Table 4.4.

Message content. After participating in theatre testing, during which a nurse practitioner conducted the Sister to Sister intervention with one of the study RAs, the RAB participants highlighted important aspects of the intervention. These included promoting condom use in

monogamous relationships, focusing on condom use persuasion, encouraging women to be persistent in their attempt to get their partners to use condoms, making condom use sexy, and educating young women on current HIV statistics.

Furthermore, the focus of the new intervention was on prevention of the most prevalent STDs, and not just HIV. Thus, wherever possible, “HIV” was replaced with “STD” in the newly adapted intervention. This decision was made to expand the scope of the original intervention to include all STDs, not just HIV. The term “STD” was used in messages that addressed chlamydia, gonorrhea, syphilis, and HIV. The term “HIV” was used in messages that were specific to prevention of HIV (i.e. injection drug use).

While RAB participants enjoyed the content areas highlighted in the Sister to Sister intervention, they were also concerned that it contained a great deal of repetition. When conducting a one-on-one, single session intervention, repetition is warranted as an effective teaching/learning tool. When sending text messages, however, RAB participants did not want message content to be heavily repeated. In addition to the introduction of new information with each text message, it was also important that intervention participants did not receive consecutive messages of the same sexual health content.

The focus group participants generally liked the content areas presented in the S2S text messages. However, they found that selected important information from the original Sister to Sister intervention was missing from the newly adapted intervention. One of these areas was the inclusion of the character with a young child. The RAB participants were clear that they did not want this character to be used in the S2S video clips. The focus group participants, on the other hand, pointed out the void left in the intervention as a result of her removal. It was decided it include this maternal character in the final intervention.

Another aspect of the intervention that was missing is the notion that STDs can be contracted from a partner who does not exhibit symptoms of an infection. The PI was the first person to recognize this exclusion in the intervention. It was again noted by one of the CHIPTS CAB members. Thus, this content was included in the final revision of the S2S intervention.

The focus group participants also mentioned the inclusion of an entirely new method of intervention delivery. They wanted the S2S intervention to include an accompanying website, where all of the content could be posted. The inclusion of this type of website would have moved the intervention from a text message intervention to a hybrid text/web-based intervention. Such a major change to the intervention was inconsistent with the aims of the study.

The final 24 messages were separated into nine content categories: myth/fact (seven messages), risk factors (seven messages), condom use (six messages), affirmation (four messages), persuasion (four messages), personal stories (two messages), statistics (two messages), condom application (one message), and more information (one message). The sum of the messages assigned to each content category is greater than the number of messages included in the intervention. This is because several messages count toward more than one content area. For instance, the message “Good thing about condoms... they can save your life. Remember, be positive, be safe, respect yourself & protect yourself, because you are worth it!” is categorized as both condom use and affirmation. Statements to support the use of various content areas are presented in Table 4.3.

Table 4.3

RAB and Focus Group Participants Comments Regarding Message Content

RAB Participants	Focus Group Participants
AVA: ...make sure it's, like, new information every time. (RAB Meeting #1, Part 2, p. 13)	LILLIAN: I like that they were very, like, they were short and sweet like, to the point. So it's like even with the memes or, like, the text messages, you know, like you read it, and it's like okay, like, it's like a constant reminder, so that's why I like it. (Focus Group Meeting, Part 3, p. 1)
BROOKLYN: ...do like the positive affirmation one, and then, like...the informational one the next time you text. (RAB Meeting #1, Part 2, p. 13)	ISABELLA: But what if, like, there was a website where... all the information is there. Like, all the other text messages are just, like, reminders. So, I think that could be used for someone who's like "oh, I wanna know everything, everything now I don't wanna wait." (Focus Group Meeting, Part 3, p. 2)
EMMA: And maybe add in, like, the "hey girl," like, in the beginning? Just to make it like, a little bit more, like, inviting. (RAB Meeting #2, p. 4)	KAYLEE: ...the woman with her child, that was more, like, powerful and a significant point...So I felt like that was something, like, significant for me and I didn't see that as far as in there. (Focus Group Meeting, Part 3, p. 6)
AVA: ...we should add something other than statistics because some people feel like, "well that wouldn't be me." You know, like they don't personalize it. (RAB Meeting #2, p. 7)	
FACILITATOR: ...do you guys wanna include the baby stuff? MULTIPLE PARTICIPANTS: No. (RAB Meeting #2, p. 71)	

Message format. Four distinct message formats—text-only messages, pictures, memes, and videos—were utilized in the S2S intervention. Detailed information of each of these message formats is discussed below. Specific statements supporting the use of these various message formats are presented in Table 4.4.

Table 4.4

RAB and Focus Group Participants Comments Regarding Message Format

RAB Participants	Focus Group Participants
BROOKLYN: Also, I think with, like, the phones, people have, like, their data plans. So, I wouldn't watch a long video because it's like "ooh, I only got two gigs this month." Like, you know. (RAB Meeting #1, Part 2, p. 7)	JULIA: I think I more so like the memes, more – I think the videos is what turned me off... I don't necessarily like the fact of getting the video to my phone. (Focus Group Meeting, Part 3, p. 1)
AVA: ...make it like "whoa, I want to watch this video!" Like, I don't know how to explain it, but, like, a good caption or something. (RAB Meeting #1, Part 2, p. 7)	LILLIAN: I do like the videos and the memes. I feel like those are more um, I dunno. I don't wanna say for our day and age, but I guess... (Focus Group Meeting, Part 3, p. 2)
CHARLOTTE: Honestly, use as many memes as possible. DELILAH: Yeah, memes are attention-grabbers. (RAB Meeting #2, p. 40)	KAYLEE: I would see myself sending this on to my friends. Like "hey, read this really quick, or watch this." 'Cause they're short videos, it's not like five minutes so you can watch it pretty quickly. (Focus Group Meeting, Part 3, p. 2)
	JULIA: I like the memes, 'cause that's social media. Like, that's us. We love memes. We love fun little gifs. Like, we like that stuff. (Focus Group Meeting, Part 3, p. 8)

Text-only messages. There were a total of seven text-only messages included in the S2S intervention. Each of the messages contained no more than 160 characters, including the spaces between each word and punctuations. In order to meet the 160-character restriction for text messages, and to increase the attractiveness of the messages for 18 to 24-year-olds, some of the original curriculum verbiage was changed. For instance, instead of including the phrase "this program was designed because we want you to live long and health lives and make safe and responsible choices to 'Respect Yourself, Protect Yourself, Because You Are Worth It!'" it was revised to read "Hey girl, we want to help you live a long, healthy life & make safe, responsible choices to "Respect Yourself, Protect Yourself, Because You're Worth It!"

Memes. Seven memes are included in the S2S intervention. A meme is “a humorous image, video, piece of text, etc., that is copied (often with slight variations) and spread rapidly by Internet users” (“Meme,” 2016). Memes typically utilize images of easily identifiable people (i.e. celebrities, television characters, etc.) surrounded by thought-provoking, sometimes sarcastic or ironic messages. They are most often shared via social media platforms. Each S2S meme includes an image of one or both of the characters in the Sister to Sister “Let’s Try Something New” video. These images are surrounded by a myth/fact message, with the myth above the image and the fact below the image. According to the focus group participants, the memes were the most enjoyable aspect of the intervention.

Videos. When asked what they enjoyed most about the original Sister to Sister intervention, the RAB participants expressed enjoyment of the intervention videos. However, they were also clear that long videos would not be well accepted as text messages. Thus, it was decided that each video would last approximately 30 seconds. It was also decided that text messages including videos links should incorporate catchy verbiage. Only one of the focus group participants expressed dislike of the video messages. Of interest, however, this same participant enjoyed the videos in the original Sister to Sister intervention. She was clear that she did not like watching videos on her phone. All of the other focus group participants, however, enjoyed the S2S videos almost as much as they enjoyed the memes.

Seven videos are included in the S2S intervention. Six of these videos are clips from the videos used in the Sister to Sister intervention. Four of the Sister to Sister video clips are of women describing their experiencing of contracting HIV. The other two Sister to Sister video clips promote negotiation skill-building through observation of a condom use conversation between a young adult Black woman and her partner. The length of each Sister to Sister-inspired

video clips ranges from 27 to 41 seconds. An additional 85-second condom application video was created to give intervention participants a visual image of proper condom application. RAB participants thought this type of skill-building video would be more helpful to intervention participants than simply sending a text with condom application instructions.

Pictures. There were three pictures included in the S2S intervention. Pictures were described as a transparent background image with text in the foreground. Pictures displayed information that was too wordy to be sent as a text message, but that should not be broken down into shorter, individual messages. The content of pictures included ideas to help participants talk to their partners about condom use and contact information for several national organizations that provide information on STD prevention, drug/alcohol abuse, and domestic violence.

Message timing. The frequency of messages was of importance to the RAB participants. They wanted the intervention messages to be sent no more than three times weekly. Thus, it was decided that one text message would be sent on Monday, Wednesday, and Friday.

RAB participants also wanted messages to be sent at times that the intervention group would be most attentive. Furthermore, it was important that messages be sent at a time of day during which their privacy could be maintained. Therefore, arbitrary message timing was avoided. Additionally, RAB participants wanted to base message timing on the message content. They decided to send messages with positive, edifying statements at 8:00 am. This time was selected to promote positive feelings throughout the day. On the other hand, messages with strong condom use reminders were sent at 7:00 pm. This was selected as the time that message recipients would be most likely preparing to go out for the evening.

Focus group participants agreed with the frequency of messages and the times at which messages would be sent. Table 4.5 contains direct quotes from RAB and focus group participants related to message timing.

Table 4.5

RAB and Focus Group Participants Comments Regarding Message Timing

RAB Participants	Focus Group Participants
EMMA: I feel like, maybe not during the day ‘cause, like, you never know... whoever can have your phone. So maybe, like, at a time, like—I feel like, afternoon to, like, early evening... when, like, you kind of have your phone to yourself. (RAB Meeting #1, Part 2, p. 10)	LILLIAN: ... ‘cause I feel like that could be annoying—more often, as opposed to spaced out. (Focus Group Meeting, Part 3, p. 2)
EMMA: ... maybe something like the positive affirmations could be, like, during the day. Like, yeah, like the start of the week or, like, um, in the morning, like, before you go out. So, you kind of have that in your head like, “I’m making this smart decision.” And, then, like, the other ones, like, reminding you to, like, be smart. Maybe before you go out. (RAB Meeting #1, Part 2, p. 12)	ISABELLA: I like the fact that it’s three days a week. I think that’s, like, the perfect amount of time. Like, it’s not too much and it’s, you know, not too little... (Focus Group Meeting, Part 3, p. 5)
AVA: But, I think nothing more than, like, two or three times a week. Otherwise, it just gets too much. (RAB Meeting #1, Part 2, p. 12)	KAYLEE: And it isn’t on the weekends when you’re busy and you’re going out. (Focus Group Meeting, Part 3, p. 5)
CHARLOTTE: ...people might like it at the beginning, but then... it just gets tiring. (RAB Meeting #1, Part 2, p. 14)	
GRACE: To where if you see it too much, you be like “I don’t wanna look at that no more.” (RAB Meeting #1, Part 2, p. 14)	

Control Group Messages

Many of the control group messages came from the Twitter handles of respected national health organizations, such as the Office of Women’s Health and the Office of Adolescent Health.

Messages were also created from information on health websites including the CDC and Diabetes in Control. Just like the intervention messages, there were a total 24 control group messages. The timing of these messages was similar to that of the intervention group messages. Each message was sent on Monday, Wednesday, or Friday at 7:00 pm. The control group message content includes diet (11 messages), exercise (10 messages), affirmations (two messages), and more information (one message). There were a total of 13 text-only messages, seven memes, and four pictures included in the control group text messages. None of the messages included videos.

Test Run of Messages

The test run was conducted as part of the training stage of the modified ADAPTT-ITT model, to determine the efficiency of message delivery prior to conducting the pilot study with the participants in phase two. All 24 intervention messages were sent to the study team (i.e. PI and RAs), three RAB participants, and the dissertation chair. One additional RAB participant joined the intervention test group during week four of the eight-week test run. As such, this message recipient was sent only 14 messages. Only the study team and the dissertation chair participated in the test run of the control group messages. They were sent all 24 control messages.

Message recipients' mobile phone providers were determined using the Carrier Lookup Tool on offered by the text-messaging platform. Their mobile service providers included Cingular ($n = 2$), Sprint ($n = 1$), T-Mobile ($n = 4$), and Verizon ($n = 1$). Mobile phone area codes were inputted into the Verizon Area Code Lookup webpage and the appropriate state was paired with each area code. Three states were identified: California ($n = 6$), Georgia ($n = 1$), and Minnesota ($n = 1$). In order to maintain consistency with CDC reports, which identify location

based on U.S. region, each state was then converted to the appropriate region: West ($n = 6$), South ($n = 1$), and Midwest ($n = 1$).

At the time of the test run, the residence of all message recipients was Los Angeles County. However, the identification of mobile phone numbers from outside of the Western region dispels the myth that mobile phone numbers are always associated with the present residence of the mobile phone owner. Furthermore, when the test run began, all of the message recipients were located in California. At one point during the test run, however, one message recipient traveled to Asia. She reported no problems receiving the text messages while abroad. Still, this confirms the inability to assume the physical location of mobile phone owners, based on their mobile phone numbers.

Text message reports showed that, for each message recipient, a mean of 16.5 messages were delivered, 6.38 messages showed no data, and no messages bounced. Although some messages were reported as having no data, none of the test run participants reported missing any text messages. As such, all messages reported as *delivered* or *no data* were noted as having been delivered to the intended participant. In order to better analyze feasibility, message delivery was coded as *all messages delivered*, *only SMS delivered*, *only MMS delivered*, or *some messages bounced*. All test run participants were in the *all messages delivered* category.

Seven of the 24 S2S intervention messages (21.2%) included links to intervention videos. Text message reports showed that video links were clicked an average of 7.86 times. The links for S2S Test Videos #1 and #2 were clicked 12 times each, more than any other video. As there were only eight test run participants, it is clear that at least one participant (12.5%) clicked both of these videos links multiple times. All other video links were clicked at least three times. This suggests that no more than three participants (37.5%) watched these videos. S2S Test Videos #5,

#6, and #7 message links had less than eight clicks each, suggesting not all participants watched these videos.

Video streaming reports showed that all S2S test videos were watched at least once. This was consistent with the reports of each video link being clicked at least once. Test Videos #1 and #2 were loaded 14 times each, more times than any other video. However, S2S Test Video #7 was watched to completion seven times, more times than any other video. Moreover, six of the test videos (85.7%) were loaded more often than their associated video links were clicked. The cause of the increased loading may be related to manual or automatic mobile webpage refreshing. This can occur any time the refresh button on a mobile webpage is clicked or when someone closes then reopens the mobile web browser application.

The video link and video streaming data suggest that video link clicks and loads are not predictive of video plays and finishes. On average, each S2S video was loaded ($M = 9.43$ video loads) 1.4 times as often as it was played ($M = 6.71$ video plays). Likewise, each video was played 1.6 times as often as it was finished ($M = 4.14$ video finishes). Additional data on link clicks and video loads, plays, and finishes are in Table 4.6.

Table 4.6

Test Run Video Results

Video	Link Clicks	Loads	Plays	Finishes
Test Run Video #1	12	14	6	3
Test Run Video #2	12	14	9	3
Test Run Video #3	8	9	8	7
Test Run Video #4	8	8	8	6
Test Run Video #5	6	7	6	6
Test Run Video #6	6	8	7	3
Test Run Video #7	3	6	3	1
Mean (Standard Deviation)	7.86 (3.29)	9.43 (3.26)	6.71 (1.98)	4.14 (2.19)

Just as all videos were not watched to completion, it may also be the case that not all text messages were read and not all memes/pictures were viewed. One reason for the low number video finishes may be the inaccurate reporting by the video-streaming platform. Another, reason for the low number of finishes may be related to familiarity with the intervention. Since all of the test run participants helped to create all of the text messages and had already viewed the full-length Sister to Sister intervention videos, they may have been less inclined to view the videos again than participants who were asked to view the videos for the first time.

During the test run, any potential problems with messages were addressed. There were no major issues that arose (i.e. inability to opt-in to the text messages or to receive text messages). One test run participant reported issues viewing multimedia graphics. It is believed that this had to do with the settings on her phone. She set up her text messages so that all multimedia are sent as links, instead of as the actual pictures, videos, etc. In order to view any multimedia sent to her

phone, she must click on the link and view the image on a website hosted by her mobile phone service provider. During the test run, this recipient had issues viewing two memes. She was able to view one of these graphics after several clicks on the associated link. Unfortunately, she was unable to view the other graphic even after several clicks on the link. It was not anticipated that a similar technological issue would occur during the pilot study.

The only changes to the intervention and control group messages, as a result of the test run, included spelling corrections and small verbiage changes.

Survey Acceptability

RAB participants were asked to complete the modified QQ-10 to evaluate the acceptability of the comprehensive phase two online survey. Thus, each participant submitted only one modified QQ-10, instead of submitting a different form for each of the phase two instruments. The results of the modified QQ-10 showed that RAB participants had an overall positive experience when completing the phase two instruments.

The mean score of the modified QQ-10 was 41. This is only nine points below a perfect score. The individual responses for each item ranged from neutral (3 points) to strongly agree (5 points) for normally coded items and strongly disagree (5 points) to neutral (3 points) for reverse-coded items. The items with the lowest individual scores showed that RAB participants were impartial concerning their enjoyment of survey completion and survey length. Cronbach's α was .94, indicating high internal consistency. Mean scores and standard deviations for the modified QQ-10 are presented in Table 4.7.

Table 4.7

Modified QQ-10 Results

Modified QQ-10 Item	<i>M (SD)</i>
1. The questionnaire helped me to communicate about my thoughts on sexual relationships.	4.00 (.63)
2. The questionnaire was relevant to me.	4.00 (.63)
3. The questionnaire was easy to complete.	4.33 (.81)
4. The questionnaire included all the aspects of sexual relationships that I am concerned about.	4.50 (.83)
5. I enjoyed filling in the questionnaire.	3.66 (.81)
6. I would be happy to complete the questionnaire again in a future study.	4.00 (.89)
7. The questionnaire was too long. ^a	3.66 (.81)
8. The questionnaire was too embarrassing. ^a	4.16 (.75)
9. The questionnaire was too complicated. ^a	4.33 (.81)
10. The questionnaire upset me. ^a	4.33 (.81)
Total Score	41 (6.26)

Note. *M* = mean, *SD* = standard deviation.

^a Score reverse-coded.

The open-ended modified QQ-10 responses helped the PI to identify duplicate items and address concerns with question skipping within the instrument packet. The RAB participants discussed whether future survey takers should be allowed to skip items. For instance, if a young woman answers that she does not have a casual sex partner, should she still be asked whether or not she uses condoms with her casual partner. It was ultimately decided that all items in the phase two survey would remain available for all phase two participants, regardless of previous

answers. This will prevent removal of question items for those participants who may misread or misunderstand an item.

Future Recruitment Efforts

In addition to assisting with the design of the S2S text message intervention, RAB and focus group participants also discussed past and future study recruitment efforts. They were told that recruitment efforts were more successful with softcopy distribution, than with hardcopy distribution. When asked “Why do you think we had better luck with the online recruitment,” Grace, a RAB participant, replied, “Cause everybody be online.” Faith, another RAB participant, echoed Grace’s sentiment. She said, “I definitely think online is a good method... Having [the flyer] online helps because you can see it more than once, you can read it more than once. If you need to, you can refer back to it.” In addition to recruitment via email, focus group participants suggested distributing recruitment flyers at social gatherings. As Julia stated, “...we party. So that’s where you will catch a big bulk of the 18 to 24, you know.”

RAB and focus group participants also identified the need for further clarification on future recruitment flyers. They suggested that participant expectations be clearly identified. An additional suggestion was the removal of the term “*sexual health*” to prevent any misunderstandings among potential study participants. As Kaylee, a focus group participant, commented, “I was like, ‘is this about sexual intercourse? Like, what is the realm?’” Isabella, another focus group participant, replied “Yeah. There were some people are like ‘well, do I have to disclose anything?’” The RAB and focus group participants agreed that phase two should be advertised as a women’s health study and not a sexual health study.

Lastly, focus group participants suggested adding more color to the phase two recruitment flyer and making it look like a meme. Julia thought the original recruitment flyer

design was unappealing. “If I’m on Facebook, I wouldn’t even glance at this... I would just not look at it. Like, it wouldn’t just be something that would catch my eye.” Another focus group participant, Julia, suggested using less words on the flyer. She commented, “It’s very, like, wordy with the title and then, like, the requirements.” The decision was made to make the flyer more visually appealing, while providing an understanding of participant requirements in as few words as possible. Both the RAB and focus group participants thought \$75 was an appropriate incentive for phase two participants.

Summary

The methods utilized in phase one of this study included hard and soft-copy recruitment, telephone screening and consent, and data collection during RAB and focus group meetings. The success of soft-copy recruitment, versus the unsuccessful nature of hard-copy recruitment, was an unanticipated surprise. The results of the five RAB meetings and one focus group meeting were imperative to the design of phase two of this study. Analyses of these findings were useful in the adaptation of the S2S intervention, revision of the phase two baseline and follow-up surveys, and the selection of phase two recruitment methods. Finally, in the training stage, the test run of the intervention and control group messages helped to iron out any overlooked or unanticipated issues with the texting platform and text messages. Phase one serves as the foundation for this adaptation study. Understanding the methods and results of phase one is important, as they heavily informed the methods of phase two.

CHAPTER 5 - PHASE TWO METHODS

This chapter provides a detailed overview of the methods implemented during the second and final phase of this mixed-methods study. During this phase, a small pilot test was conducted using a randomized controlled design to evaluate intervention acceptability, feasibility, and preliminary primary and secondary outcomes. In the original ADAPT-ITT model, these would have been separate steps of the testing stage. However, for this study, the pilot testing and randomized controlled trial (RCT) sub-stages of the model were combined.

Specific Aims and Research Questions

Aim 2. Determine the acceptability and feasibility of the S2S intervention.

RQ 6. What do participants like/dislike about the intervention?

RQ 7. What is the degree of active participation in the intervention as determined by the number of video links clicked, the number of videos watched to completion, and the number of participants who remained opted-in to the text messages throughout the entire eight weeks?

RQ 8. What unanticipated issues arose that should be addressed in a future study of the intervention?

Aim 3. Compare the primary outcome (condom use behaviors) and secondary outcomes (condom use self-efficacy, condom use intentions, and sexual relationship power) among the young adult Black women in the S2S intervention group with those of the control group.

RQ 9. Is there a difference in baseline and post-intervention measures of condom use between the intervention and control groups?

Hypothesis 1. Young adult Black women receiving S2S will have a significant increase in condom use from baseline to post-intervention, in comparison to those in the control group.

RQ 10. Is there a difference in baseline and post-intervention condom use self-efficacy, condom use intentions, and sexual relationship power between the intervention and control groups?

Hypothesis 2. Young adult Black women in the S2S group will have significant increases in condom use self-efficacy, condom use intentions, and sexual relationship power from baseline to post-intervention, in comparison to those in the control group.

RQ 11. What is the relationship between condom use self-efficacy, condom use intentions, sexual relationship power, socio-demographic characteristics, and condom use?

Hypothesis 3. At post-intervention, condom use among young adult Black women will be associated with condom use self-efficacy, condom use intentions, sexual relationship power and socio-demographic characteristics.

Procedures

Following approval by the University of California, Los Angeles South General Institutional Review Board, study recruitment flyers were posted on Facebook, Twitter, Instagram, and Craig's List. Flyers were also distributed via email. Interested young women were asked to contact the study PI by mobile phone or email. Following telephone screening for eligibility and online consent, participants completed a baseline survey that assessed their condom use behaviors, self-efficacy, and intentions, as well as their sexual relationship power.

Emails containing a link to the baseline and follow-up surveys were sent from Survey Monkey directly to each participant. If participants did not begin their surveys within a few days, a reminder email was sent. Each instrument was displayed on a different online page. All study participants received the instruments in the same order. The literacy level of each instrument was assessed using the Flesch Reading Ease and Flesch-Kincaid Grade Level scores.

Upon completion of the baseline survey, participants were randomized to either the intervention or control group using Random.org, an online random number service. To complete study enrollment, each participant was required to opt-in to the text messages by texting a group-specific, time-sensitive keyword to the mobile number associated with the text message platform. Each keyword expired the Monday after it was sent. Following self-enrollment, the text messages were sent to the participants.

Intervention and control group text messages were sent every Monday, Wednesday, and Friday for eight weeks. All participants received their first text message on Monday. Participants in the intervention group were sent sexual health text messages, while those in the control group were sent diet and exercise text messages. In all, 24 non-tailored, one-way text messages were sent to each study group over a period of eight weeks. The text messages were assessed to ensure they maintained a literacy level at or below the eighth grade.

The Monday after the last text message was sent, study participants were asked to complete a follow-up survey. This survey was similar to the baseline survey, but also included items to assess text message acceptability and feasibility. Additionally, the PI collected feasibility data from the online messaging and video platforms. Study data were exported into SPSS and analyzed by the PI.

Study Setting

All study participants had a primary residence in the U.S., however they were not required to be in the country during the study. As long as participants were able to receive text messages, the intervention was not affected by their physical location. The only factor limiting the study setting was the area code associated with the participants' mobile phone numbers. That is, each participant had to own a phone number with a U.S. area code.

Sample Size

In their ADAPT-ITT model, Wingood and DiClemente (2008) recommended the use of 20 participants for acceptability and feasibility testing. In order to test for acceptability, feasibility, and preliminary behavior changes, a total of 100 participants were recruited. In anticipation of attrition as high as 25%, 75 participants (at least 37 per group) were expected to complete the study. This more than adequately meets the number of participants recommended by the ADAPT-ITT model.

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria for phase two of this study were almost identical to the criteria in phase one. Criteria for inclusion were self-reported: 1) Black ethnicity, 2) female gender, 3) age 18 to 24, 4) vaginal, anal, or oral sex with a man in the past three months, and 5) ownership of a mobile phone with text messaging capabilities. Inclusion criteria were chosen to ensure that study participants represented the target population.

Exclusion criteria included: 1) being married, 2) planning to become pregnant within the six months, 3) sharing a mobile phone with another person, and 4) sharing an email address with another person. Exclusion criteria were chosen to prevent recruitment of women who may not be open to using condoms and to help maintain the privacy of the study participants.

Participant Recruitment

Based on the success of online recruitment in phase one, phase two participants were recruited solely online. A recruitment flyer was posted on the study teams' personal Facebook, Twitter, and Instagram pages. It was also posted on Facebook and Instagram pages created specifically for study recruitment and in the community section of the major cities listed on the Craig's List website. Additionally, one Facebook advertisement was purchased. This advertisement targeted Black young adult women, ages 18 to 24, residing in the United States. The advertisement ran for 30 days.

The phase two recruitment flyer was emailed to Black Student Union (BSU), African Student Union (ASU), and National Pan-Hellenic Council (NPHC) sorority representatives at United States colleges and universities. Each email requested that the recipient forward the recruitment flyer to their email contacts. Moreover, following screening, whether or not they were eligible, potential participants were encouraged to share the flyer with their friends, family, and colleagues. Flyers were also emailed to phase one participants. These young women were not eligible for inclusion in phase two. However, they agreed to share the flyer with their colleagues.

The appearance and content of the phase two recruitment flyer was slightly different from that of the phase one flyers. Information about the study surveys, number of text messages, participant incentives, and contact information were listed on the flyer. A copy of the phase two recruitment flyer is located in Appendix G.

Screening and Consent

Young women who were interested in participating in phase two were screened for eligibility during a brief telephone interview with the study PI. A script was utilized to ensure

consistency of screening among all potential study participants. Screening began with a brief synopsis of the research study. Potential participants were then asked about their gender, age, ethnicity, mobile phone use, marital status and sexual activity. The screening was phrased sequentially so that the least sensitive questions were asked first. While it was impossible to verify participants' age, ethnicity, or sexual behaviors during a verbal conversation, telephone screening helped to decrease some aspects of obscurity associated with their gender. A copy of the phase two screening tool is in Appendix H.

Unlike the verbal consent received for phase one, phase two participants completed online consent forms hosted by Survey Monkey. By using an online platform, participants were able to read and submit the consent form at a time and in a manner that was most convenient for them. For instance, some may have chosen to use a personal computer or laptop to submit their consent forms, while others may have used a tablet computer or other mobile device. The only participants that were given a time limit for consent submission were those screened during the final week of study recruitment. The PI's contact information was listed in the email mail containing the link to the consent form and on the actual consent form, in case participants needed to further discuss the form prior to submission. A copy of the phase two consent form is in Appendix I.

Randomization

Using the Random.org online random number website, a sequence of numbers was used to determine the study group in which participants were placed. The numbers started at one and ended at 100, representing the 100 anticipated phase two participants. As each participant submitted her baseline survey, she was assigned to the next available randomly generated number in the sequence. Participants randomized to odd numbers were assigned to the

intervention group and those randomized to even numbers were assigned to the control group. For instance, the first five numbers in the sequence were 9, 40, 47, 22, and 31. So the first, third, and fifth participants to enroll in the study were assigned to the intervention group, while the second and fourth participant to enroll were assigned to the control group. Assignments for each study group continued in this manner until recruitment ended.

Intervention and Control Group Text Messages

Regardless of study group, each study participant received 24 text messages. Message templates were created to ensure that every participant in the intervention group received the text messages in the same order. The same was true of the control group. Templates were labeled as *“S2S Week 1, Monday,” “Control Week 1, Monday,” “S2S Week 1, Wednesday,” “Control Week 1, Wednesday,”* and so forth. Text messages were sent beginning the Monday after each participant fully enrolled in the study. Text messages containing words of affirmation were sent at 8 am, while all other text messages were sent at 7 pm.

Intervention group text messages included three pictures, seven memes, seven videos, and seven traditional text-only messages. These text messages contained sexual health information such as *“18-24 y.o. Black women have the highest rates of Chlamydia, Gonorrhea, Syphilis, & HIV among women. Respect yourself, protect yourself, because you’re worth it!”* The S2S text messages had a Flesch Reading Ease of 74.8 and a Flesch-Kincaid Grade Level of 5.8. In contrast, control group text messages included four pictures, seven memes, and 13 traditional text-only messages. These text messages contained diet and exercise content such as *“Start off with a good breakfast, like boiled eggs, turkey bacon, and a bowl of fruit, to jumpstart your day.”* The control group text messages had a Flesch Reading Ease of 70.2 and a Flesch-Kincaid Grade Level of 6.4.

Acceptability and Feasibility

Feasibility data should be analyzed using descriptive statistics, qualitative methods of data collection, and information related to the administration of the intervention (Lancaster et al., 2004; Tickle-Degnen, 2013). As such, both quantitative and qualitative data were collected for this study. EZ Texting and Vimeo were used to collect feasibility data via system-generated reports. Survey Monkey was used to collect self-reported primary and secondary outcomes, socio-demographic characteristics, text message acceptability, and text message feasibility.

Platform Reports

The EZ Texting text message reports provided data on the number of text messages received by participants, the number of times each text message link was clicked, and the number of participants that opted-out from receiving subsequent text messages. The Vimeo video streaming reports provided information on the number of times each video was loaded, played, and finished. This information was only available in aggregate and not for each individual participant. All system-generated data were compiled by the study PI and placed in excel spreadsheets for easy organization, then exported to SPSS for data analysis.

Acceptability/Feasibility Instrument

A review of the literature found no widely used measurement tool created to assess the acceptability and feasibility of a pilot study intervention. Therefore, a 17-item instrument was created to assess participants' acceptability of the intervention and the feasibility of the text messages. Instrument items were designed to address areas related to intervention design, information provided, text message frequency, and intervention duration. The instrument has a Flesch Reading Ease of 75.3 and a Flesch-Kincaid Grade Level of 5.1.

Fourteen of the items on the instrument were used to assess text message acceptability. Examples of acceptability items include: *1. I enjoyed receiving the text messages, 2. The text messages contained information that was helpful to me, 3. The text messages were too frequent,* Three of the items on the instrument were used to assess text message feasibility. These items were: *6. I was able to read the text messages as soon as I received them. 12. I was unable to view the memes, and 17. I was unable to view the videos.* Items 16 and 17 were included solely for the intervention group participants. These items include: *16. I really liked the videos, and 17. I was unable to view the videos.*

Additionally, three open-ended questions were asked. Two of these items were open to all study participants: *What other thoughts do you have related to the text messages?* and *How can the text message program be improved?* The remaining item was specific to the intervention group participants: *To the best of your memory, of the seven videos sent, how many videos did you view?*

The quantitative portion of the acceptability/feasibility instrument was scored using a five-point Likert scale. The available participant responses and their corresponding scores are: strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points) and strongly disagree (1 point). Depending on the way in which the items were phrased, some answers were reverse-coded. The reverse-coded items for the intervention acceptability/feasibility survey were items 3, 7 – 9, 12 – 14, and 17. As such, for these items only, the participant responses had the following scores: strongly agree (1 point), agree (2 points), neutral (3 points), disagree (4 points) and strongly disagree (5 points). Scoring was achieved by adding the points associated with each item response. The highest possible score for the scale was 75. The lowest possible score was 15. Scores were positively correlated with intervention acceptability and feasibility. Thus, high

scores indicated a greater acceptability and feasibility, in comparison to low scores. A copy of intervention acceptability/feasibility instrument is in Appendix J.

Operationalization and Measurement Study Variables

Group assignment was the independent variable in this study. As previously discussed, participants in the intervention group were sent S2S text messages and participants in the control group were sent diet and exercise messages. Dependent variables included primary and secondary study outcomes. The primary outcome of the study was condom use. The secondary outcomes of the study were condom use self-efficacy, condom use intentions, and sexual relationship power. Based on the study's conceptual model, it was anticipated that condom use would be related to the self-efficacy, intentions, and power. Socio-demographic characteristics were used to describe the study participants and to determine possible associations with condom use.

Condom Use

Condom use was expressed as the application of a male condom immediately prior to engaging in vaginal, anal, or oral sex with a main or casual partner. Sexual intercourse was categorized as vaginal sex, anal sex, or oral sex. Vaginal sex was expressed as sex in which the study participant's vagina was penetrated by her partner's penis. Anal sex was expressed as his penis entering her anus (butt). Oral sex was expressed as his penis entering her mouth.

Sexual partners were categorized as main or casual sexual partners. A main sexual partner was defined as man who study participants felt committed to above anyone else. A casual sexual partner was defined as a man who was not the participants' main partner or whom they did not consider to be their main partner at the time of sexual intercourse.

The CDC's Sexual Behavior Questions ([SBQs], 2001) were used to measure condom use. These questions were compiled as a list of core questions for HRSB surveillance (Rietmeijer, Lansky, Anderson, & Fichtner, 2001). Items were developed through review of other instruments, literature review, feedback from sexual health professionals, and pilot testing. Instead of using the entire questionnaire, which includes items related to sexual intercourse in exchange for money or drugs and sexual intercourse while under the influence of drugs and alcohol, the instrument was modified by the study PI. This modified version contained 12 items related to condom use during vaginal, anal, and oral sex. Participants were able to answer each item for main partners and casual partners.

Wording of several items were changed to enhance the items' clarity. For example, the following vaginal sex questions are from the original SBQ survey: *1. In the past 3 months have you had vaginal sex where your partner's penis entered your vagina?* *2. Was a condom used every time?* *3. Was a condom used some of the time?* and *4. The last time you had vaginal sex, where your partner's penis entered your vagina, was a condom used?* For this study, questions two and three were modified as such: *2. Was a condom used every time you had vaginal sex in the past 3 months?* and *3. Was a condom used some of the times you had vaginal sex in the past 3 months?* For the follow-up survey, the time period for each item was changed from three months to eight weeks. The modified SBQ had a Flesch Reading Ease of 82.1 and a Flesch-Kincaid Grade Level of 6. This was true for both the baseline and follow-up surveys.

As the SBQ instrument is not a scale, the participants' responses were not calculated into a total score. Instead, the questions were used to determine the frequency of condom use during vaginal, anal, and oral sex with main and casual partners. For each type of sexual intercourse with main and casual partners, participants' responses were recoded as never, sometimes,

always, and no sex with a main/casual partner. A copy of the baseline SBQ instrument is in Appendix K.

Self-Efficacy

According to Bandura (1986), self-efficacy is a person's judgment of their ability to use the necessary skills to perform a certain action. It is not a question of whether or not the person possesses a skill-set, but rather a question of whether or not the person will be able to utilize the skill set at the appropriate time. For this study, self-efficacy was expressed as a reflection on one's ability to properly use condoms, and to persuade their partner(s) to use them, during sexual intercourse.

The Condon Use Self Efficacy Scale (CUSES) Assertiveness and Mechanics subscales were used to measure self-efficacy. CUSES is a 28-item scale developed by Brafford and Beck (1991) to measure expectations related to the acquisition, use, and disposal of condoms, and negotiation of condom use. It was created following a literature review of five valid and reliable scales. An expert panel of five university faculty and staff who had experience in the field of sexuality was then asked to review the items. Next, 183 college students completed questionnaires regarding factors that influenced condom use with new partners. Fifteen common condom use categories were identified by the students, leading to item revision and creation of the final scale. Cronbach's α for CUSES is .81 (Brafford & Beck, 1991).

CUSES has four subscales that were created by Brien, Thombs, Mahoney, and Wallnau (1994). The assertiveness subscale is a three-item scale that measures participants' perceived skills related to of condom use assertiveness. Cronbach's α for this subscale is .80 (Brien et al., 1994). The mechanics subscale is a four-item scale that measures participants' perceived ability to properly apply a condom. Cronbach's α for this subscale is .78 (Brien et al., 1994). CUSES or

its various subscales have been used to measure self-efficacy among Latino adolescents (Kapadia et al., 2012), racially diverse groups of heterosexual undergraduates (French & Holland, 2013), Black male college students (Aronson et al., 2013), and adult women among whom 63% were Black (Swan & O'Connell, 2012).

The original CUSES items were created for both male and female respondents. However, since only female participants were included in this study, the wording in two of the four mechanics subscale items was modified to better reflect the female-only study population. The items in the modified CUSES mechanics subscale include: *1. I feel confident in my ability to put a condom on my partner, 2. I feel confident that I could use a condom successfully, 3. I feel confident I could gracefully remove and dispose of a condom when we have intercourse, and 4. I feel confident in my ability to put a condom on my partner quickly.* The CUSES mechanics subscale has a Flesch Reading Ease of 59.3 and a Flesch-Kincaid Grade Level of 8.2.

The items in the CUSES assertiveness subscale did not require any modifications. These items include: *1. I feel confident in my ability to discuss condom usage with any partner I might have, 2. I feel confident in my ability to suggest using condoms with a new partner, and 3. I feel confident I could suggest using a condom without my partner feeling "diseased".* The CUSES assertiveness subscale has a Flesch Reading Ease of 53.5 and a Flesch-Kincaid Grade Level of 9.4. Although the grade level readability is above the eighth grade cut-point, the use of this instrument to assess condom use self-efficacy outweighs the ninth grade readability.

The CUSES assertiveness and mechanics subscales are scored on a five-point Likert scale. Participant responses and their corresponding scores are: strongly agree (4 points), agree (3 points), undecided (2 points), disagree (1 point) and strongly disagree (0 points). For this study, the term “undecided” was replaced with “neutral” to maintain consistency with the other

instruments. Scoring was achieved by adding the points associated with each item response. The highest possible score for assertiveness and mechanics and subscales were 12 and 16, respectively. The lowest possible score for either subscale was 0. Scores were positively related to condom use self-efficacy. Thus, high scores indicated a higher self-efficacy toward condom use, in comparison to low scores. A copy of the CUSES mechanics subscale is in Appendix L. A copy of the CUSES assertiveness subscale is in Appendix M.

Intentions

An intention is the “subjective probability that [a person] will perform some behavior” (Fishbein & Ajzen, 1975, p. 288). Each person makes a choice to act or to refrain from such action. However, intentions do not always lead to an intended behavior, especially when the behavior requires the participation of more than one person. As it relates to condom use, both sexual partners may have the same or differing intentions. Because only one of the sexual partners was involved in this study, hers were the only intentions that were measured. Accordingly, intentions were expressed as the participants’ planned decision to use or disregard the use of condoms. For this study, overall condom use intentions were assessed regardless of the type of partner reported (main vs. casual).

The Sexual Risk Scale (SRS) Intention to Try subscale was used to measure intentions. Developed by DeHart and Birkimer (1997), SRS is a 38-item instrument that measures various constructs related to risky sexual behavior. The original item pool for the scale was derived from college students’ responses to questions about their sexual health attitudes, beliefs, and behaviors. These items were tested on 296 college students, revised, and retested on 200 students. Cronbach’s α for SRS is .86 (DeHart & Birkimer, 1997).

SRS has a total of six subscales. The entire scale or its various subscales have been used to measure intentions among German college students (Greitemeyer, Kastenmüller, & Fischer, 2013), South African men who have sex with men (Tun et al., 2012), young adult Black and White women (Gakumo et al., 2012), and African American women (Malow et al., 2012).

For this study, the seven-item intention to try subscale was used to measure intentions to use condoms during future sexual encounters. Its Cronbach's α is .80. Item 1 was modified to address STDs in general, and not simply HIV/AIDS. Examples of the items in the modified SRS intentions subscale include: *1. If I were going to have sex, I would take precautions to reduce my risk of STDs*, *2. "Safer" sex is a habit for me*, and *3. I intend to follow "safer sex" guidelines within the next year*. The SRS intention to try subscale has a Flesch Reading Ease of 85.2 and a Flesch-Kincaid Grade Level of 3.8.

SRS is scored using a five-point Likert scale. While the most of the items are coded normally, item 5 is reverse-coded. The normally coded participant responses are: strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points) and strongly disagree (1 point). For item five only, participant responses have the following scores: strongly agree (1 point), agree (2 points), neutral (3 points), disagree (4 points) and strongly disagree (5 points). Scoring was achieved by adding the points associated with each item response. The highest possible score for the intention to try subscale was 35. The lowest possible score was seven. Scores were positively related to intentions to use condoms. Thus, high scores indicated a greater intention to use condoms during future sexual encounters, in comparison to low scores. A copy of the SRS intention to try subscale is in Appendix N.

Power

Power is the display of dominance by one person over another person. The term is synonymous with control, authority, and supremacy. Within the context of heterosexual relationships, men are most often viewed as the partner with the most power (Connell, 1987). As such, men are frequently the decision-makers or decision-influencers of condom use. For this study, sexual relationship power was expressed by participants' perceived decision-making authority.

The Sexual Relationship Power Scale (SRPS) Relationship Control subscale was used to measure power. SRPS is a 23-item scale developed by (Pulerwitz, Gortmaker, & DeJong, 2000). The scale is negatively correlated with violence in a relationship and positive correlated with condom use. A 40-item scale was first developed using information gained from literature review and focus groups. Six focus groups, comprised of 56 women, were then conducted to review and revise the item pool. Both English and Spanish versions of the items were created. The revised 50-item scale was revised again and a 36-item scale was tested on 388 women. Factor analysis contributed to the final 23-item scale in which two factors accounted for 86% of the variance (Pulerwitz et al., 2000). Cronbach's α for the English version of SRPS is .84 (Pulerwitz et al., 2000).

SRPS has two subscales. The entire instrument or its subscales have been used to measure sexual relationship power among young adult Latino men and women (Stokes, Harvey, & Warren, 2015), African-American adolescent females (Raiford, Seth, & DiClemente, 2013), and African American women (Lanier, 2013). For this study, the 15-item relationship control subscale was utilized. Cronbach's α for the English version of this subscale is .85. Examples of the items in the SRPS relationship control subscale include: *1. If I asked my partner to use a*

condom, he would get violent, 2. If I asked my partner to use a condom, he would get angry, and 3. Most of the time, we do what my partner wants to do. The SRPS relationship control subscale has a Flesch Reading Ease of 85.6 and a Flesch-Kincaid Grade Level of 4.1.

The SRPS relationship control subscale is scored on a 4-point Likert scale. Participant responses and their corresponding scores are: strongly agree (1 point), agree (2 points), disagree (3 points), and strongly disagree (4 points). Scoring was achieved by adding the points associated with each item response. The highest possible score for the relationship control subscale was 60. The lowest possible score was 15. Scores were positively correlated with relationship power. Thus, high scores indicated greater power in sexual relationship, in comparison to low scores. A copy of the SRPS relationship control subscale is in Appendix O.

Socio-Demographic Characteristics

Phase two participants completed six baseline socio-demographic items very similar to those completed by the phase one participants. They were asked to report their current age, education level, employment status, pregnancy history, STD history, and last sexual encounter. While the content of the items remained the same, the wording for the phase two socio-demographic items was revised for clarity and easier online administration. Subsequently, although the revised survey was easier to administer online, its readability was slightly more difficult than the version utilized in phase one. The phase two socio-demographic items had a Flesch Reading Ease of 64.1 and a Flesch-Kincaid Grade Level of 6.4, compared to the Flesch Reading Ease of 69.6 and Flesch-Kincaid Grade Level of 4.9 in phase one.

During the course of the study, it became clear that additional follow-up socio-demographic items should be presented to each participant upon completion of the study. These items included information on current pregnancy status, issues with mobile phone and changes to

mobile phone number during study enrollment, and the manner in which participants heard about the study. The item addressing pregnancy status was added after four participants identified themselves as being pregnant during the telephone screening. It was important to give each participant an opportunity to disclose this information. Also, pregnancy status may have influenced the participants' condom use behaviors. Thus, there was a need to control for pregnancy during data analysis.

The follow-up items addressing mobile phone issues or mobile number changes were added to help identify participants who may have received only some of the text messages. This information is also available in the feasibility reports. However, self-reported mobile phone issues needed to be identified to confirm feasibility objective data.

Lastly, it was important to identify the way in which each participant first became aware of the study to ensure robust data regarding effective recruitment methods. As this information was collected from phase one participants, and heavily influenced the recruitment methods utilized in phase two, it was determined that recruitment information should be retrieved from phase two participants as well. This information can help to inform the methods of future intervention studies with young adult Black women.

The follow-up demographic items had a Flesch Reading Ease of 62.9 and a Flesch-Kincaid Grade Level of 6.3. Copies of the phase two baseline and follow-up socio-demographic items are in Appendix P.

Diet and Exercise Data

Items related to diet and exercise were included in the baseline and follow-up surveys to reflect the content of the texts messages sent to control group participants. A 38-item instrument created by Medina, Balcázar, Hollen, Nkhoma, and Mas (2007) was selected for the breadth of

instrument items and ease of instrument completion. The instrument, referred to here as the Lifestyle Behavior Questionnaire (LBQ), evaluates dietary, weight control, physical activity, and smoking behaviors (Medina et al., 2007). It was created for use by Hispanic men and women and originally administered by promotores (Hispanic community health educators). The LBQ items were adapted from a fotonovela workbook. A panel of experts provided feedback on each item and the instrument was then tested on a group of promotores (Medina et al., 2007). The instrument is available in both English and Spanish. The English version was used for this study.

Four of the five LBQ subscales were utilized for this study: salt and sodium consumption (10 items, Cronbach's $\alpha = .73$), cholesterol and fat consumption (10 items, Cronbach's $\alpha = .82$), weight-control practices (five items, Cronbach's $\alpha = .75$), and physical activity level (10 items, Cronbach's $\alpha = .83$) (Medina et al., 2007). Each item is reflective of either diet or exercise behaviors. Examples of the dietary items include: *How often do you do the following... 1. Buy fresh vegetables or frozen vegetable? 2. Buy garlic or garlic powder instead of garlic salt? and 3. Choose foods labeled low sodium, sodium free, or no salt added?* Examples of the physical activity items include: *When you are at work, which of the following best describes what you do? Would you say? a. Mostly sitting or standing? b. Mostly walking? or c. Mostly heavy labor or physically demanding work?*

Each LBQ dietary items is scored on a 4-point Likert scale. Participant responses and their corresponding scores are: never (0 points), sometimes (1 point), usually (2 points), and always (3 points). The LBQ physical activity items include one multiple-choice item, two yes/no items, and five fill-in items (for those items asking the number of minutes/hours of physical activity). LBQ has a Flesch Reading Ease of 70.8 and a Flesch-Kincaid Grade Level of 6.8. Although LBQ data was collected, the items were not analyzed. This is because these items

address the content of the control group text messages. This instrument was solely utilized so that control group participants would not receive survey questions only related to their sexual health. A copy of the LBQ instrument is in Appendix Q.

Data Analysis

Quantitative data analysis was conducted using SPSS, version 23 and SAS version 9.4. Surveys were reviewed for missing data as soon as possible following survey submission. If any items were skipped, participants were contacted and asked whether the skipping was intentional. For those who skipped items unknowingly, their surveys were updated with their responses. For those participants who did not respond to the item-skipping inquiry or those who skipped items purposely, no changes were made.

Qualitative data were analyzed using qualitative content analysis (QCA). No inquiry was made for open-ended items that were skipped. It was assumed that any unanswered open-ended questions were left blank because the participant did not have any additional comments related to the acceptability/feasibility of the text messages.

Socio-Demographic Data

The items on the baseline and follow-up socio-demographic instruments included ratio and nominal data. Some of the data collected from these instruments were recoded into new variables in order to simplify data analysis and interpretation of results. For instance, pregnancy history was collected as ratio data (i.e. *how many times have you ever been pregnant?*). However, a new dichotomous, nominal pregnancy history variable was created (i.e. *have you ever been pregnant?*). The same typed of nominal variable was created for STD history (i.e. *have you ever had an STD?*). Similarly, all “some college, but no degree” and “associate degree”

responses in the education variable were combined to create a new response (i.e. *some college, but no bachelor degree*).

Socio-demographic characteristics were analyzed using descriptive statistics (i.e. means, percentages, and standard deviations) and compared for differences using the Fisher's Exact statistical test. Age was coded as ratio data, while education, employment, pregnancy history, STD history, and last sexual encounter were coded as nominal data. Any socio-demographic variables that were significantly different were used as covariates in subsequent analyses.

Text Message Acceptability and Feasibility

The individual quantitative items on the acceptability/feasibility instrument were coded as ordinal data. The sum of the scale was coded as interval data. A t-test was used to assess differences between the intervention group scores and the control group scores. The reliability of the instrument was calculated using Cronbach's alpha. In like manner, quantitative feasibility data retrieved from platform-generated reports related to the number of text messages delivered and the number of videos watched was coded as ratio data. Findings from these reports were analyzed using descriptive statistics (i.e. means and standard deviations) for each group.

Qualitative items on this instrument were analyzed using QCA. This analysis was conducted to identify manifest content, which provides information on what was said. Following the review of all open-ended responses, the PI formulated categories. Direct quotes were selected to support these the creation of these categories.

Primary and Secondary Outcomes

Sexual behavior data were coded as nominal data (yes/no). These data refer to the type of sexual encounter (vaginal, anal, or oral) experiences with each type of partner (main or casual). For participants who had sexual intercourse with a main or casual partner, condom use data was

coded as ordinal data (always, sometimes, never). Individual items for the instruments measuring self-efficacy, intentions, and power data were coded as ordinal data. Cronbach's α was used to assess the internal consistency within and between each instrument subscale. The sum of the subscales were calculated in SPSS and coded as interval data. Each hypothesis was analyzed separately, as indicated below.

Hypothesis 1. Young adult Black women receiving S2S will have a significant increase in condom use from baseline to post-intervention, in comparison to those in the control group.

First, analysis of sexual behavior was conducted using a binary generalized estimating equation. Then, for participants who had sexual intercourse, condom use behavior was analyzed using an ordinal generalized estimating equation. The analysis provided an understanding of condom use behaviors of the intervention group and control group over time.

Hypothesis 2. Young adult Black women in the S2S group will have significant increases in condom use self-efficacy, condom use intentions, and sexual relationship power from baseline to post-intervention, in comparison to those in the control group.

The results of the secondary outcome scales (self-efficacy, intentions, and power) were categorized as interval data. A repeated measures analysis of variance (ANOVA) test was used to analyze individual subscale results. The analysis provided an understanding of changes among the secondary outcomes over time. The reliability of the instruments used to assess secondary study outcomes was calculated using Cronbach's α . These outcomes were also analyzed for internal consistency using t-tests.

Hypothesis 3. At post-intervention, condom use among young adult Black women will be associated with condom use self-efficacy, condom use intentions, sexual relationship power, and socio-demographic characteristics.

Using nominal data from the condom use instrument, interval data from the secondary outcome subscales, ratio/nominal data from the socio-demographic instrument, and group assignment a multinomial logistic regression was used to determine which secondary outcomes and socio-demographic characteristics, if any, are predictors of condom use.

Human Subjects

Phase two study procedures were approved by the University of California, Los Angeles South General Institutional Review Board (IRB#15-001453). Participants received up to \$75 for their participation. A \$25 e-gift card was emailed to participants who completed the phase two baseline study survey. A \$50 e-gift card was emailed to participants who completed the phase two follow-up survey.

Any information that was obtained in connection with this study and that identified participants remained confidential and, as per IRB policy, would be disclosed only with participants' permission or as required by law. No personal identifiable information was recorded on SPSS data sheets. Each participant received a code, consistent with her assigned number from the sequence of numbers created by the randomized number generator. The only person with access to the code sheet was the study PI. This document, and all other confidential or identifiable study data, was password protected. In addition to the individual documents requiring a password to view, all study-related documents were maintained on password-protected computers. At no time was any identifiable participant data printed.

Only the participants' mobile phone numbers and their participant codes were entered into the text-messaging platform. There was no way to connect their names or email addresses with their mobile phone numbers, when using the messaging platform. The messaging platform was always accessed over a secure server.

Email addresses and first names were entered into Survey Monkey so that the consent form and study surveys could be electronically delivered to participants. Survey Monkey has a secure server. Survey responses were encrypted whenever the PI downloaded them. If raw study data is ever shared with other researchers, all measures will be taken to ensure that study participants are de-identified.

Just as the PI was committed to maintaining study participants' confidentiality, each study participant was asked to maintain the confidentiality of the study. Confidentiality was first discussed in the study consent form. By signing the form, it was implied that study participants would not forward any text messages they received as part of this study. This will be done to prevent contamination of the study groups. They were also reminded of the need for confidentiality in the email containing the keyword needed to opt-in to the text message platform.

At any time, participants could choose whether or not they want to be involved in the study. The consent form and Research Participant Rights stated that they could withdraw consent and discontinue participation at any time, for any reason. Participants were also informed that they could refuse to answer any survey items they may have felt uncomfortable answering, and still remain in the study. A full list of participants' rights was shown to each participant once she submitted her consent form.

Conclusion

The methods described in this chapter provide an understanding of phase two study design, the rationale for the design, study protocols and measures, and human subjects considerations. Quantitative and qualitative methods were used to analyze primary and

secondary outcomes, socio-demographic characteristics, and text message acceptability and feasibility. Chapter 6 provides phase two results.

CHAPTER 6 - PHASE TWO RESULTS

The purpose of the second phase of the study was to assess the acceptability, feasibility, and preliminary outcomes of the S2S intervention. These preliminary outcomes included behavioral changes resulting from the intervention (e.g., condom use) and the influence of the intervention on the theoretical constructs of condom use (e.g., condom use self-efficacy, condom use intentions to use condoms, and sexual relationship power). Both qualitative and quantitative data were utilized to assess the acceptability, feasibility, and preliminary outcomes of the S2S text message intervention.

Participant Recruitment

Phase two recruitment occurred online between November 2016 and December 2016. As discussed in chapter 5, the decision to collect recruitment data from phase two participants was made during the course of the study. As such, this information was received only from participants who completed the follow-up survey ($n = 87$).

Phase two participants were recruited via email ($n = 22$), Facebook advertisements ($n = 20$), Facebook posts by friends ($n = 9$), Instagram posts ($n = 1$), and snowballing ($n = 35$). None of the phase two participants were recruited via Twitter or Craig's List postings. These findings are consistent with those of the phase one participants. There were no significant differences between recruitment methods of the intervention and control groups ($p = .56$).

Participants were asked not to share study related text messages with anyone. This was emphasized multiple times during study recruitment. However, as 40% of participants learned of the study through word of mouth, there was some concern with group contamination.

Retention Rates

One hundred forty-two young adult Black women were screened for this study. Forty-one potential participants were ineligible because they were outside of the age range ($n = 5$), did not have heterosexual intercourse in the past three months ($n = 33$), or did not self-identify as Black ($n = 3$). One potential participant was found to be eligible, but because she had already participated in phase one of this study, she was not allowed to enroll in the second phase. Consent forms were sent to the first 100 eligible young women. At this point, no new potential participants were screened for the study. A weekly reminder email was sent to all young women who were eligible for the study, but did not submit their consent forms. The online consent form was closed five weeks after recruitment began. Ninety-six consent forms were submitted during the recruitment period. Four potential participants did not submit their consent forms.

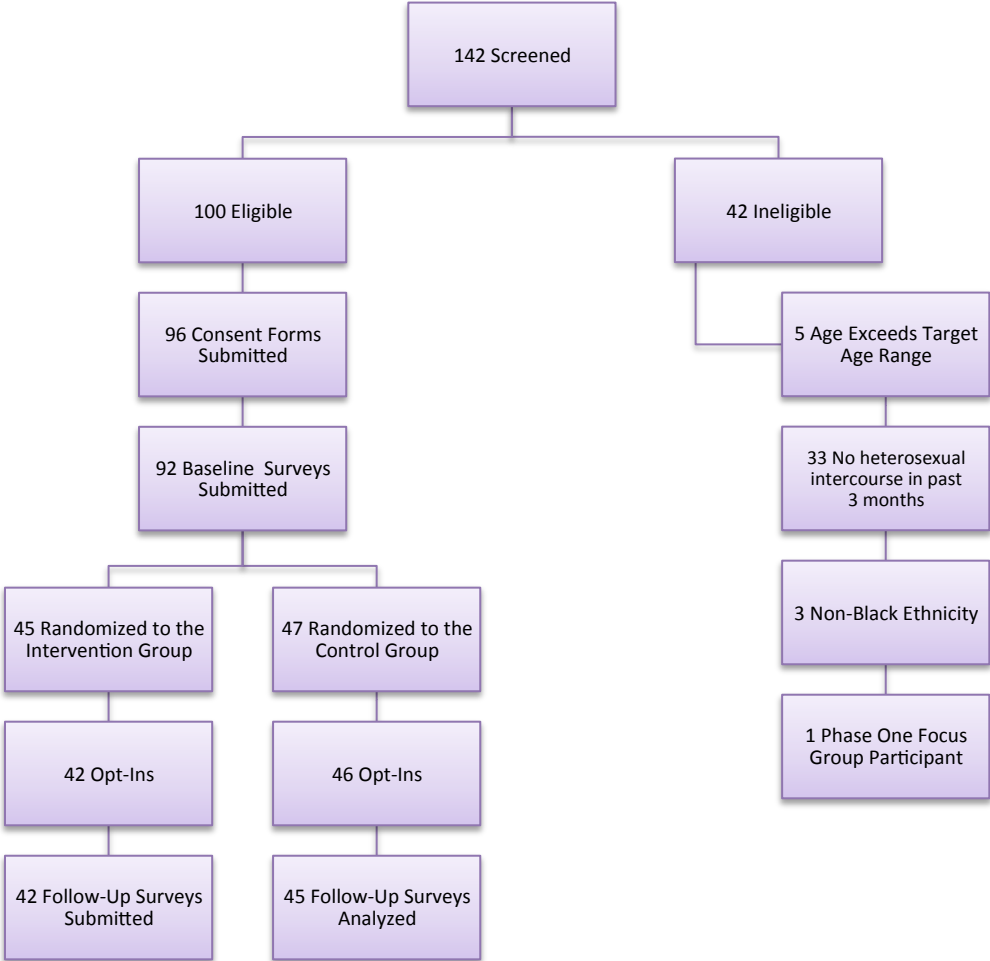
Baseline surveys were sent within a few hours of consent form submission. Weekly reminders were sent to anyone who submitted a consent form, but did not submit a baseline survey. By the end of the enrollment period, 92 young women submitted a completed baseline survey. Additionally, one young woman began, but did not complete her survey. She was not randomized to a study group and did not receive the baseline survey incentive.

All phase two participants who completed a baseline survey were randomized to a study group. However, three participants (3.3%) never opted-in to the text messages. One additional participant (1.1%) attempted to opt-in, but could not. After being notified by the participant, the PI attempted to manually add her to the appropriate text message group, but the confirmation text message that was sent to the participant bounced. Because she could not receive any text messages from the messaging platform, this participant was removed from the study. She was given the baseline incentive (\$25 gift card) for her time.

The follow-up survey was sent to all participants who opted-in to the text messages ($N = 88$). One hundred percent of the intervention group participants ($n = 42$) and 95.7% of the control group participants ($n = 44$) submitted a completed follow-up survey. One control group participant completed two-thirds of the follow-up survey without submitting it. Upon consultation with the dissertation chair, it was decided to include this participant's responses in the data analysis. As such, control group retention was recalculated as 97.8%. The overall retention rate for this study was 98.9%. Figure 6.1 provides a visual depiction of study recruitment and retention.

Figure 6.1

Phase Two Recruitment and Retention



Participant Socio-Demographic Characteristics

Baseline socio-demographic data was received from all participants ($N = 88$). One participant did not submit a follow-up survey, and thus, was not included in the current pregnancy data asked at follow-up. To maintain and assist with clarity, the age, education, and employment results of phase two participants were collapsed in the same manner as those of the phase one participants. The only socio-demographic characteristics that significantly differed between study groups were previous and current pregnancies.

The mean age of the intervention group participants (21.43 years, $SD = 1.71$) was about seven months older than the mean age of the control group participants (20.74 years, $SD = 1.78$). This is consistent with intervention group participants' reports of more college education, compared to the education level of the control group participants. Almost one-third of the intervention group participants ($n = 13$) reported their highest level of education as a bachelor's degree, while less than one-fifth of the control group participants ($n = 8$) reported having a four-year college degree. No phase two participants reported having a graduate degree.

Fifteen phase two participants (17%) were unemployed, including five from the intervention group and 10 from the control group. An additional 15 participants (17%), 11 from the intervention group and four from the control group, reported working 40 or more hours each week. The number of participants working 40 or more hours per week is consistent with the number of participants in each group who reported having a bachelor's degree. It is also consistent with the number of participants in graduate programs, who may have a four-year degree, but may not be working fulltime. Although this information was not reported in the demographic survey, it was volunteered during telephone screening or noted in email signatures of some participants. The remaining participants ($n = 58$) were employed part-time.

A total of 38 participants (43.1%) reported having previous pregnancies ($n = 17$) and/or STD diagnoses ($n = 28$). Among young women who reported prior pregnancies, the number of pregnancies ranged from one to seven. Four participants (4.6%)—all of whom were randomized to the intervention group—were pregnant during the study. And so, there were a significantly higher number of currently pregnant participants in the intervention group than in the control group ($p = .03$). The intervention group also had a significantly higher number of participants reporting prior pregnancies, compared to those in the control group ($p = .04$).

Seven of the participants who reported a history of pregnancy also reported a history of STD diagnoses. These diagnoses included chlamydia ($n = 19$), gonorrhea ($n = 3$), and other ([i.e. HPV, Trichomoniasis, Herpes, etc.], $n = 6$). During data analysis, it was discovered that this STD survey question did not allow participants to select more than one answer. Thus, it is highly probable that several participants had been diagnosed with both chlamydia and gonorrhea, as it is typical to see these diagnoses paired. Still, the pregnancy and STD findings suggest that 43.1% of the phase two participants had previously engaged in high-risk sexual behavior, as indicated by a past pregnancy (19.3%), current pregnancy (4.6%), or prior STD diagnosis (31.8%).

Thirty-nine phase two participants (44.3%) had engaged in sexual intercourse within one week prior to completing their socio-demographic survey. Forty-eight participants (54.5%) had engaged in sexual intercourse within the past three months. One participant (1.1%) reported engaging in sexual intercourse in the past year. When asked to clarify this information, as heterosexual intercourse in the past three months was a study inclusion criterion, she stated she had received oral sex from her partner, but had not engaged in vaginal, anal, or female-to-male oral sex. Upon consultation with her dissertation chair, the PI decided to let the participant remain in the study.

Participants' mobile service providers included Cingular/AT&T ($n = 25$), Metro PCS ($n = 1$), Sprint ($n = 28$), T-Mobile ($n = 15$), and Verizon ($n = 19$). Mobile phone area codes were identified for 21 states, representing all four regions of the U.S. More than half of study participants had mobile phone numbers from the Southern region of the U.S. ($n = 45$). Additionally, more than 50% of participants had a mobile phone number from one of six states. The states with the highest area code frequency among participants were California ($n = 17$), Maryland ($n = 16$), Texas ($n = 7$), Ohio ($n = 6$), and Georgia/Pennsylvania ($n = 5$ for each state).

Combined socio-demographic characteristics of all phase two participants are displayed in Table 6.1. Comparisons of socio-demographic characteristics of intervention group participants and control group participants are displayed in Table 6.2.

Table 6.1

Combined Socio-Demographic Characteristics of Phase Two Participants

Demographics	Number (<i>n</i> = 88)	%
Mean Age (Std. Deviation)	21.07 (1.73)	
18 – 19 years	19	21.6
20 – 24 years	69	78.4
Education Completed		
High school degree or equivalent	15	17.0
Some college, but no bachelor degree	52	59.1
Bachelor degree	21	23.9
Employment		
Employed, working 40 or more hours per week	15	17.0
Employed, working 1 - 39 hours per week	58	65.9
Not employed	15	17.0
Prior Pregnancy		
Yes	17	19.3
No	71	80.7
Currently Pregnant ^a		
Yes	4	4.50
No	83	94.3
Prior STDs		
Yes	28	31.8
No	60	68.2
Last Sexual Intercourse		
Past Week	39	44.3
Past Three Months	48	54.5
Past Year	1	1.10
Mobile Service Provider		
Cingular	25	28.4
Metro PCS	1	1.10
Sprint	28	31.8
T-Mobile	15	17.0
Verizon	19	21.6
Area Code Region		
West	20	22.7
Midwest	11	12.5
South	45	51.1
Northeast	12	13.6

^a Responses provided by participants who completed follow-up survey (*n* = 87).

Table 6.2

Socio-Demographic Characteristics of Phase Two Participants by Group

Demographics	Intervention Group (n = 42)		Control Group (n = 46)		p
	Number	%	Number	%	
Mean Age (Std. Deviation)	21.43 (1.71)		20.74 (1.78)		.11
18-20 years	6	14.3	13	28.3	
21-24 years	36	85.7	33	71.7	
Education Completed					.32
High school degree or equivalent	6	14.3	9	19.6	
Some college, but no bachelor degree	23	54.8	29	63.0	
Bachelor degree	13	31.0	8	17.4	
Employment					.07
Employed, working 40 or more hours per week	11	26.2	4	8.7	
Employed, working 1 - 39 hours per week	26	61.9	32	69.6	
Not employed, looking for work	5	11.9	10	21.7	
Prior Pregnancy*					.04
Yes	12	28.6	5	10.9	
No	30	71.4	41	89.1	
Currently Pregnant ^a					.03
Yes	4	8.9	0	0	
No	38	91.1	45	100	
Prior STDs					.45
Yes	15	35.7	13	28.3	
No	27	64.3	33	71.7	
Last Sexual Intercourse					.55
Past Week	19	45.2	20	43.5	
Past Three Months	22	52.4	26	56.5	
Past Year	1	2.40	-	-	
Mobile Service Provider					.82
Cingular	12	28.6	13	28.3	
Metro PCS	1	2.40	-	-	
Sprint	13	31.0	15	32.6	
T-Mobile	8	19.0	7	15.2	
Verizon	8	19.0	11	23.9	
Area Code Region					.33
West	8	19.0	12	26.1	
Midwest	3	7.10	8	17.4	
South	25	59.5	20	43.5	
Northeast	6	14.3	6	13.0	

^a Responses provided by participants who completed follow-up survey (n = 87).

* p ≤ .05.

Text Message Acceptability/Feasibility

Study text messages were sent to intervention and control group participants three times per week for eight weeks. Each group was sent 24 text messages. Acceptability findings were retrieved from the acceptability/feasibility instrument. Feasibility findings were retrieved from the acceptability/feasibility instrument and the text-messaging platform reports.

Self-Reported Mobile Phone Issues

Thirty-nine intervention group participants (92.9%) reported that they had no issues with their mobile phones during the study. Of the intervention participants who reported having issues with their mobile phones during the study ($n = 3$), one participant reported having a mobile phone that was not in service for a period of time, two participants reported having their mobile phones replaced, and two participants reported having their mobile phone numbers changed. Only one person contacted the PI during the study to report changing phone numbers. This participant was given permission opt-in to the messages again using a new keyword. The PI then removed her previous mobile number from the text-messaging platform.

Acceptability/Feasibility Instrument Results

Instrument Scoring. The mean score of the acceptability/feasibility instrument was high among both the intervention ($M = 60.10$, $SD = 7.05$) and the control ($M = 60.02$, $SD = 6.65$) groups. There was no significant difference in the means scores between the two study groups. These results suggest that the S2S text message intervention just as acceptable among intervention group participants than the diet/exercise text messages were among the control group participants. Cronbach's α for the acceptability/feasibility instrument was calculated using all survey items and using only those items answered by all study participants (items 1 – 15). For both calculations Cronbach's α was .76, indicating high internal consistency.

A comparison of each item shows that for both study groups, the text messages were enjoyable and contained information that was helpful to the participants. The scores also indicate that the text messages were sent over an appropriate length of time. Neither group reported being inconvenienced by the text messages. And, they both reported that they would be willing to share these types of texts messages with their friends. Both groups' highest scored item was item #15 (*"I know women who would benefit from receiving these types of text messages"*). As it relates to feasibility, neither group reported difficulty receiving study-related text messages. Among the intervention group, specifically, there were no reports of difficulty viewing study-related videos. Mean scores and standard deviations for each item are presented in Table 6.3.

Table 6.3

Acceptability/Feasibility Instrument Scores

Instrument Items	Mean (Std. Deviation)	
	Intervention Group	Control Group
1. I enjoyed receiving the text messages.	4.38 (0.83)	4.36 (0.78)
2. The text messages contained information that was helpful to me.	4.36 (0.96)	4.40 (0.76)
3. The text messages were too frequent. ^a	4.07 (0.81)	4.02 (0.82)
4. I really liked the memes.	3.93 (0.95)	4.14 (0.88)
5. I would share these types of text messages with my friends.	4.07 (1.02)	3.93 (1.04)
6. I was able to read the text messages as soon as I received them.	4.38 (0.94)	4.55 (0.63)
7. Receiving the text messages was an inconvenience for me. ^a	4.26 (0.89)	4.41 (0.76)
8. The text messages should have been sent for a shorter period of time. ^a	3.93 (0.95)	3.98 (1.07)
9. I found it difficult to receive the text messages. ^a	4.43 (0.80)	4.43 (0.79)
10. I looked forward to receiving the text messages.	3.64 (1.06)	4.00 (0.94)
11. I liked the times of day that the text messages were sent.	3.81 (1.13)	3.91 (1.03)
12. I was unable to view the memes. ^a	4.10 (1.10)	4.41 (0.84)
13. I wish there were more text messages. ^a	2.88 (1.17)	2.41 (1.11)
14. The text messages should have been sent for a longer period of time. ^a	3.38 (1.13)	2.82 (1.13)
15. I know women who would benefit from receiving these types of text messages.	4.48 (0.71)	4.47 (0.63)
16. I really liked the videos. ^b	4.31 (0.69)	-
17. I was unable to view the videos. ^a	4.41 (0.95)	-
Total Score ^c	60.10 (7.05)	60.02 (6.65)

Note. Range for each item = 1 – 5.

^a Score reverse-coded.

^b Item scored for intervention group only, as control group did not receive any videos.

^c Total score is for items 1 through 15 only.

Videos Viewed. Forty intervention group participants reported watching between zero and seven videos ($M = 4.38$ videos, $SD = 2.49$ videos). Only two participants reported not watching any of the videos. Fifteen intervention group participants (35.7%) reported watching all seven videos. Potential causes of the low rate of video views are discussed in chapter 7.

Intervention comments. Study participants were asked to share any comments they had related to the text messages. One intervention group participant wrote, “They have great advice.” Another intervention group participant stated, “I enjoyed the text messages, I learned a lot.” Not all of the comments were positive, however. Using qualitative content analysis (QCA), each open-ended response was reviewed by the PI for similar or related content. Once all responses were reviewed, six categories emerged: myths/facts, health promotion, convenience, videos, not for me, and sharing texts. Table 6.4 provides selected quotes from intervention group participants to support each category’s formation.

Table 6.4

S2S Text Message Intervention Participant Comments

Myths/Facts	Health Promotion	Convenience
I think the Fact / Myth memes were a little obvious but I otherwise enjoyed learning stats.	...All in all it was beneficial to me, even if just a reminder every now and then to take care of my health.	I liked the short blurbs of information.
I think the facts were pretty interesting.	Make me think about choices when choosing safe sex.	The text messages were great. I was able to read them at my own convenience.
I learned a lot from the text messages and some of myths I thought were true I learned were not. The text messages were relevant to things I am experiencing in my life.	I thought that the messages made me want to live a healthier lifestyle.	I enjoyed reading the text messages as they were delivered in a simple format, and definitely catered to our generation by using text and memes etc.
They were great but I felt like I knew a lot of the information maybe some of the facts could be things that are less known.		I really appreciated the convenience in receiving critical information via every day technology. I also appreciated the time of day the messages were sent. I typically got messages after I had gotten settled in from a long day.
The get [sic] messages were helpful in telling the myth & then the truth.		
Videos	Not for Me	Sharing Texts
I liked that the message were short as well as the videos.	The texts did not fit my needs and were irrelevant and not helpful...	...I showed them to my partner.
I like the length and practicality of the videos. The videos were the most informative.	They were informative but a nuisance.	Every time I received a text I would stop what I was doing and share it with my friends and they became excited to hear what was next when the text came.
	A lot of reading.	

Suggestions for improvement. Study participants were also asked to provide suggestions for improvement. One intervention participant wrote, “Maybe send a text alert before the actual alert. It is a little awkward when someone looks down at your phone and STD is shown largely on the screen.” Another intervention participant stated, “It worked great for me. I don't have any improvement suggestions.” All suggestions were analyzed using QCA. Again, six categories emerged: message frequency, time of delivery, intervention duration, increased interactivity, content revisions, and video revisions. Table 6.5 provides selected quotes from intervention group participants in each of these categories.

Table 6.5

Suggestions for Intervention Improvement

Message Frequency	Time of Delivery	Intervention Duration
I think one should be sent every other day / more frequent.	Send messages at night.	More text messages sent.
I would've liked to recurve [sic] a text every single day.	Choosing the time of day that the messages were sent so that they could be read at a convenient time.	Keep it going for a longer time maybe.
	The text messages could come at the same time whenever they were sent out. Sometimes I would get a text in the morning, sometimes it would be at night.	Make it shorter to the point.
	Being able to choose what time of the day you receive text messages.	Continue it until the person doesn't want it anymore and be able to request the same for someone else who is interested in reviewing the texts.
More Interactive	Content Revisions	Video Revisions
Interactive activities with the text links/videos.	More tailoring is necessary.	The videos were not really watched because I was in public when receiving them.
Maybe incorporating some type of feed back from participants throughout the study. Not too much. But something to help it be more interactive.	Sometimes the texts felt redundant. Maybe switching up the content more often.	Less videos. Texts are quick and easy and you can go back to it, when being sent a video link it was easy to forget to go back and view it.
	More personable.	

Text Message Platform Data

As this is a study of the S2S text message intervention, and there were no group differences in the acceptability/feasibility instrument scores, only the feasibility findings of the intervention group are presented here.

Text Message Delivery. The EZ Texting reports showed all messages were delivered to 33 of intervention group participants (78.6%). Although the text message platform provided information on the delivery of each message, it was impossible to determine whether or not the messages were read. The remaining nine participants (21.4%) had at least one text message that bounced (i.e. the message was sent, but not received). These participants were separated into two message delivery categories: some messages bounced ($n = 5$) and only SMS received (i.e. text-only messages; $n = 4$).

There was no association between self-reported mobile phone issues and bounced text messages. For two of the participants who reported having issues with their mobile phones, all text messages were delivered. Only one participant in the *some bounced messages* category reported issues with her mobile phone during the study. This participant's report of a mobile phone replacement during the study is consistent with the message platform showing five consecutive bounced messages associated with her mobile phone number. It is highly likely that these bounced messages occurred during the time her mobile phone was in need of a replacement. The other four participants who had some bounced messages, according to the platform-generated reports, did not self-report any issues with their mobile phones. Moreover, none of the participants who received only SMS messages reported issues with their mobile phones. This discrepancy between self-reported mobile phone issues and platform-generated reports of bounced messages will be discussed more in chapter 7.

There was also no pattern of mobile service providers among participants for which some messages bounced. Cingular serviced two of the participants with reports of bounced messages and Sprint, T-Mobile, and Verizon serviced the remaining three participants. Furthermore, the recipients of the intervention test run text messages utilized each of these mobile service

providers. Thus, it is unlikely that the text messages bounced because of service provider issues. It is more likely that bounced messages were caused by poor cellular reception or individual mobile phone settings.

Unlike the participants who had one or more bounced messages, there was a clear pattern of mobile service providers among participants who only received SMS messages. T-Mobile serviced three of these participants and Metro PCS serviced the remaining participant. Thus, one out of every five T-Mobile customers in the intervention group did not receive MMS messages (i.e. memes or pictures) from the text message platform. Moreover, the only Metro PCS customer in the intervention group did not receive any MMS messages sent from the text message platform. The combined number of participants serviced by T-Mobile and Metro PCS was less than any other mobile service provider utilized by the study participants. It may be the case that these mobile service providers are utilized less frequently than other mobile service providers because of unreliable service. I don't think you need the last sentence as it is speculative

The text messages with the highest bounce frequency were messages #6, 9, and 16. Each of these messages bounced among six intervention group participants ($n = 14.3\%$). Text message #6 was a picture containing a mnemonic to help young women persuade their partners to use condoms. Text message #9 was a meme depicting a myth/fact statement regarding the misperception that unprotected sex is evidence of monogamy. Finally, text message #16 was a meme depicting a myth/fact statement illustrating the risk of contracting an STD in the mouth by engaging in oral sex without using a condom.

Only 4 of the 24 text messages (9.5%) were delivered to every intervention group participant. These text messages were #1, 2, 3, and 5. It is important to note that the first three

text messages were delivered to each participant. Text message #1 welcomed the participants to the intervention and set the tone for all messages to follow. Text message #2 was a video that gave HIV statistics among Black women. Text message #3 was a video showing proper condom application. As this was the only condom skill-building video, it is very important to note that it was delivered to all intervention group participants. Text message #5, the final text message to be delivered to all intervention participants, was a video showing condom negotiation techniques. As this is one of two videos demonstrating this skill, it was very important that it was delivered to all participants.

Videos Viewed. Video links were included in seven of the 24 text messages (21.2%) sent to intervention group participants. Text message reports showed that video links were clicked an average of 20 times among the 42 young women in the intervention group. It is unclear whether each link click came from a different participant or whether the link was clicked multiple times by one or more participants. The video link with the greatest frequency of clicks was Video #2 ($n = 39$). Conversely, video link # 7 was clicked fewer times than any other video link ($n = 8$). Thus, with a range of eight to 39 clicks per video link, compared to 42 participants in the intervention group, findings suggest that not all intervention group participants watched the intervention videos.

Video streaming reports showed that all S2S intervention videos were played to completion at least once. Again, it is unclear whether videos with multiple loads, plays, and finishes were watched once by different participants or watched multiple times by the same participant. However, the reports of each video having one or more finishes are consistent with the reports of each video link being clicked at least once. Also, consistent with its associated video link having the greatest frequency of clicks, S2S Video #2 was loaded ($n = 47$ loads) and

played ($n = 27$ plays) more times than any other video. However, S2S Video #1 had more finishes ($n = 7$ finishes) than S2S Video #2 ($n = 5$ finishes). Thus, as was found during the phase one test run, video link clicks and loads did not necessarily indicate video plays or completion.

Each video was loaded at an equal or greater frequency ($M = 23.86$ loads) than it was clicked ($M = 20$ clicks). In like manner, each video was loaded more often than it was played ($M = 14.86$ plays). On average, each video was played ($M = 14.86$ video plays) more than four times as often as it was watched to completion ($M = 3.43$ video finishes).

As with the results of the intervention test run conducted in phase one, phase two intervention group participants watched more videos at the beginning of the intervention than they did at the end of the intervention. Possible causes for the decrease in video views throughout the intervention include video fatigue and inability to view video at the time the message was sent. All available data on link clicks and video loads, plays, and finishes are in Table 6.6.

Table 6.6

S2S Video Results for the Participants in the Intervention Group (n = 42)

Video	Link Clicks	Loads	Plays	Finishes
S2S Video #1	34	46	26	7
S2S Video #2	39	47	27	5
S2S Video #3	23	28	16	3
S2S Video #4	16	16	12	3
S2S Video #5	8	8	7	1
S2S Video #6	13	14	10	3
S2S Video #7	7	8	6	2
Mean (Std. Deviation)	20 (12.54)	23.86 (16.86)	14.86 (8.61)	3.43 (1.99)

The findings of the feasibility data collected from the text-messaging platform are inconsistent with the self-reported feasibility data collected from the study participants. As previously stated, 15 intervention participants reported watching all seven S2S videos. However, with less than 15 plays for Videos #4, 5, 6, and 7, it is unclear how participants watched videos that were not played. Furthermore, it can be surmised that, at maximum, six participants watched all of the intervention videos. This calculation comes from the notion that each video had at least six plays. Possible causes of the inconsistencies between platform-generated and self-reported data are discussed in Chapter Seven.

Opt-outs. One intervention group participant opted-out of the text messages after receiving the 22nd message, but she still expressed interest in completing the follow-up survey. Upon speaking with the PI, she stated that she did not realize that opting-out of the messages would prevent her from taking the follow-up survey, and thus, receiving the final study

incentive. As she had received 91.7% of the text messages, and upon consultation with the dissertation chair, it was decided to allow this participant to complete a follow-up survey.

Two-way communication. The intervention was a one-way text message intervention. However, the text message platform allowed participants to send or reply to text messages. While there were text messages sent from 10 intervention group participants and six control group participants in response to the study-related text messages, the PI did not respond to any of these text messages. The incoming text messages from intervention group participants included phrases such as “great” ($n = 3$), “thank you” ($n = 4$), and “thanks” ($n = 2$). Two intervention participants also responded using emojis. Furthermore, in response to the first video, one intervention participant responded, “thank you, that video was informative!” Most participants stopped replying to text messages after the first response text went unanswered by the PI.

Primary and Secondary Outcomes

To determine outcomes of the phase two pilot test of this study, three hypotheses were tested. Results of this hypotheses testing are presented following a discussion of the descriptive findings of the primary (condom use) and secondary (condom use self-efficacy, condom use intention, and sexual relationship power) outcomes of the study.

Descriptive Findings

Condom Use. At baseline, heterosexual intercourse in the past three months was reported. Cross-tabulations were utilized to note group differences in vaginal, anal, and oral sex with a main or casual partner. No significant differences were found between the study groups. The most frequently reported baseline sexual activities were vaginal sex with a main partner ($n = 77, 87.5\%, p = .34$) and oral sex with a main partner ($n = 68, 77.3\%, p = .39$). Conversely, the least frequently reported sexual activities at baseline were anal sex with a main partner ($n = 14,$

15.9%, $p = .20$) and oral sex with a casual partner ($n = 19$, 21.6%, $p = .49$). No study participants reported anal sex with a casual partner at baseline or follow-up.

Just over one-fifth of study participants who engaged vaginal sex with a main partner at baseline reported condom use during every vaginal sexual encounter with their partner ($n = 16$, 20.8%), while 50.6% reported no condom use during these sexual encounters ($n = 39$).

Moreover, less than one in every 20 participants who reported having oral sex with a main partner at baseline reported condom use during every oral sexual encounter with their partner ($n = 6$, 4.4%), while 86.7% reported no condom use during these sexual encounters ($n = 59$). There were no significant differences between the two study groups in their baseline reports of always, sometimes, or never using condoms during vaginal ($p = .76$) or oral sex with a main partner ($p = .27$). There was also no significant group difference in baseline reports of condom use during last vaginal ($n = 22$, 28.6%, $p = .83$) or oral sex with a main partner ($n = 5$, 7.4%, $p = .77$).

At post-intervention follow-up, heterosexual intercourse over the past eight weeks was assessed. Consistent with baseline findings, no significant differences were noted between the study groups. Also consistent with baseline findings, vaginal ($n = 68$, 78.2%, $p = .78$) and oral sex with a main partner ($n = 52$, 59.8%, $p = .75$) were the most frequently reported sexual activity at follow-up. Reports of vaginal sex with a main partner decreased by 9.3%, between baseline and follow-up. Moreover, reports of oral sex with a main partner decreased by 17.5%, during the same time period. Anal sex with a main partner continued to be the least frequently reported sexual activities at follow-up ($n = 6$, 6.9%, $p = .40$). However, follow-up reports of oral sex with a casual partner ($n = 10$, 11.5%, $p = .26$) were greater than the reports of anal sex with a casual partner ($n = 9$, 10.3%, $p = .40$), causing the latter of these to be the second least frequently reported sexual activity.

Positive results were noted among participants who engaged in vaginal sex with a main partner. Condom use during every vaginal sexual encounter with a main partner increased by 10.1% between baseline and follow-up ($n = 21, 30.9\%$). Similarly, condom use during last vaginal sex with a main partner increased by 11.1% ($n = 27, 39.7\%$). These increases in condom use are reflective of the 2.1% decrease in follow-up reports of condom nonuse during vaginal sex with a main partner ($n = 33, 48.5\%$). However, no participants reported condom use during every oral sex with a main partner at follow-up. This is a decrease of 4.4%, compared to baseline reports. Furthermore, the number of participants who never used a condom during oral sex with a main partner ($n = 50, 96.2\%$) increased by 9.5% at follow-up, compared to baseline reports. No participants reported condom use during last oral sex with a main partner, a decrease of 7.4%. These findings suggest that participants focused more on decreasing high-risk sexual behavior (condom nonuse during vaginal sex) than risky sexual behavior (condom nonuse during oral sex).

There were no significant differences between the study groups in their follow-up reports of always, sometimes, or never using condoms during vaginal ($p = .93$) or oral sex with a main partner ($p = .17$). There was also no significant difference in follow-up reports of condom use during last vaginal sex with a main partner ($p = .46$). In contrast to baseline reports, no participants reported condom use during their most recent encounter of oral sex with a main partner. Tables 6.7 and 6.8 provide descriptive data for all baseline and follow-up reports of sexual activity and condom use with main and casual partners, respectively.

Table 6.7

Baseline and Follow-Up Reports of Sexual Activity and Condom Use with Main Partners

Sexual Activity	Baseline ^a		<i>p</i> ^c	Follow-Up ^b		<i>p</i> ^c
	<i>N</i> = 88			<i>N</i> = 87		
	Intervention Group (<i>n</i> , %)	Control Group (<i>n</i> , %)		Intervention Group (<i>n</i> , %)	Control Group (<i>n</i> , %)	
Vaginal Sex	37 (88.1)	40 (87.0)	.34	34 (81.0)	34 (75.6)	.78
Condom Always	9 (24.3)	7 (17.5)		10 (30.3)	11 (32.4)	
Condom Sometimes	10 (27.0)	12 (30.0)	.76	7 (21.2)	6 (17.6)	.93
Condom Never	18 (48.6)	21 (52.5)		16 (48.5)	17 (50.0)	
Condom at Last Sex	11 (29.7)	11 (27.5)	.83	15 (44.1)	12 (35.3)	.46
Anal Sex	9 (21.4)	5 (10.6)	.17	2 (4.8)	4 (8.9)	.40
Condom Always	1 (11.1)	2 (40.0)		-	1 (25.0)	
Condom Sometimes	3 (33.3)	-	.23	-	1 (25.0)	.47
Condom Never	5 (55.6)	3 (60.0)		2 (100)	2 (50.0)	
Condom at Last Sex	1 (11.1)	2 (40.0)	.21	-	2 (50.0)	.22
Oral Sex	31 (73.8)	37 (80.4)	.39	27 (64.3)	25 (55.6)	.75
Condom Always	1 (3.20)	2 (5.60)		-	-	
Condom Sometimes	4 (12.9)	1 (2.80)	.27	2 (7.40)	-	.16
Condom Never	26 (83.9)	33 (91.7)		25 (92.6)	25 (100)	
Condom at Last Sex	2 (6.5)	3 (8.1)	.77	-	-	-

Note. Condom use percentages are based on the number of participants in each group who reported having the associated type of sex at baseline or follow-up. Percentages may not add up to 100% due to missing data.

^a“sex, partner” percentages are based on the total number of participants in the intervention (*n* = 42) and control (*n* = 46) group who submitted baseline surveys and opted-in to the text messages. ^b“sex, partner” percentages are based on the total number of participants in the intervention (*n* = 42) and control (*n* = 45) group who submitted follow-up surveys. ^c*p*-value for in aggregate for condom use always, sometimes, and never.

Table 6.8

Baseline and Follow-Up Reports of Sexual Activity and Condom Use with Casual Partners

Sexual Activity	Baseline ^a		<i>p</i> ^c	Follow-Up ^b		<i>p</i> ^c
	<i>N</i> = 88			<i>N</i> = 87		
	Intervention Group (<i>n</i> , %)	Control Group (<i>n</i> , %)	<i>p</i>	Intervention Group (<i>n</i> , %)	Control Group (<i>n</i> , %)	<i>p</i>
Vaginal Sex	9 (21.4)	13 (28.3)	.33	4 (9.5)	5 (11.1)	.92
Condom Always	3 (33.3)	4 (30.8)		3 (75.0)	1 (20.0)	
Condom Sometimes	4 (44.4)	6 (46.2)	.94	1 (25.0)	3 (60.0)	.23
Condom Never	2 (22.2)	2 (15.4)		-	1 (20.0)	
Condom at Last Sex	5 (55.6)	5 (38.5)	.53	4 (100)	2 (40.0)	.06
Oral Sex	7 (16.7)	12 (26.1)	.49	3 (7.10)	7 (15.6)	.26
Condom Always	-	-		-	-	
Condom Sometimes	-	1 (8.3)	.43	-	1 (14.3)	.49
Condom Never	7 (100)	11 (91.7)		3 (100)	6 (85.7)	
Condom at Last Sex	-	-	-	-	1 (14.3)	.49

Note. Condom use percentages are based on the number of participants in each group who reported having the associated type of sex at baseline or follow-up. Percentages may not add up to 100% due to missing data.

^a“sex, partner” percentages are based on the total number of participants in the intervention (*n* = 42) and control (*n* = 46) group who submitted baseline surveys and opted-in to the text messages. ^b“sex, partner” percentages are based on the total number of participants in the intervention (*n* = 42) and control (*n* = 45) group who submitted follow-up surveys. ^c*p*-value for in aggregate for condom use always, sometimes, and never.

Self-efficacy. The mean score for the baseline Condom Use Self Efficacy Scale (CUSES) Mechanics subscale was more than one point higher among intervention group participants ($M = 12.40$, $SD = 3.44$), compared to control group participants ($M = 11.02$, $SD = 3.89$). Cronbach’s α for the CUSES Mechanics subscale was .86 at baseline, indicating high internal consistency. Following the receipt of all text messages, the mean CUSES Mechanics subscale score for the intervention group increased by more than one point ($M = 13.71$, $SD = 3.24$). Similarly, the control group participants’ mean score on the CUSES Mechanics subscale also increased by

more than one point at follow-up ($M = 12.31$, $SD = 3.71$). At this time point, Cronbach's α for the CUSES Mechanics subscale was .90, indicating high internal consistency. There were no significant differences between the CUSES Mechanics subscale scores of the intervention and control group at baseline or follow-up.

The other instrument used to measure self-efficacy was the CUSES Assertiveness subscale. At baseline, the intervention group had a slightly higher score than the participants in the control group ($M = 11.07$, $SD = 1.79$ vs. $M = 10.53$, $SD = 1.59$). Cronbach's α for the CUSES Assertiveness subscale was .82, indicating high internal consistency. At follow-up, the intervention group's CUSES Assertiveness score dropped to 10.95 ($SD = 1.53$), while the control group's score increased to 10.91 ($SD = 1.70$). Internal consistency for the CUSES Assertiveness subscale remained high at follow-up (Cronbach's $\alpha = .83$). There were no significant differences between the CUSES Assertiveness subscale scores of the intervention and control group at baseline or follow-up.

Intention. Baseline Sexual Relationship Scale (SRS) Intention subscale scores of the intervention group ($M = 28.21$, $SD = 5.67$) and the control group participants ($M = 28.71$, $SD = 5.69$) were similar. The baseline internal consistency for this subscale was high (Cronbach's $\alpha = .89$). At follow-up, the intention scores of the intervention group ($M = 29.90$, $SD = 6.07$) and control group ($M = 29.58$, $SD = 4.64$) participants continued to be similar. Both groups' mean scores increased by less than one point. Again, internal consistency for this time period was high (Cronbach's $\alpha = .90$). There were no significant differences between the SRS Intention subscale scores of the intervention and control group at baseline or follow-up.

Power. For the final measure of secondary outcomes, the Sexual Relationship Power Scale (SRPS) Control subscale was utilized. Baseline scores for the intervention group

participants were slightly higher than those of the control group participants ($M = 52.31$, $SD = 6.51$ vs. $M = 51.67$, $SD = 6.65$). In the follow-up assessment, negligible change in score was observed for the intervention group ($M = 52.29$, $SD = 6.33$), while the control group's score increased slightly ($M = 52.49$, $SD = 6.53$). Instrument reliability for both baseline and follow-up scores indicated high internal consistency (Cronbach's $\alpha = .87$ at both time periods). Table 6.9 provides a summary of all of the secondary outcome scores. There were no significant differences between the SRPS Control subscale scores of the intervention and control group at baseline or follow-up.

Table 6.9

Scores for Secondary Outcome Measurements

Instrument	Intervention Group		Control Group		<i>p</i>
	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95 % CI	
Baseline					
CUSES Mechanics	12.40 (3.44)	[11.28, 13.53]	11.02 (3.89)	[9.93, 12.11]	.23
CUSES Assertiveness	11.07 (1.79)	[10.55, 11.59]	10.53 (1.59)	[10.03, 11.03]	.25
SRS Intention	28.21 (5.67)	[26.47, 29.96]	28.71 (5.69)	[27.03, 30.40]	.41
SRPS Control	52.31 (6.15)	[50.34, 54.28]	51.67 (6.65)	[49.77, 53.57]	.16
Follow-Up					
CUSES Mechanics	13.71 (3.24)	[12.64, 14.79]	12.31 (3.71)	[11.28, 13.35]	.78
CUSES Assertiveness	10.95 (1.53)	[10.46, 11.45]	10.91 (1.70)	[10.13, 11.39]	.40
SRS Intention	29.90 (6.07)	[28.47, 31.56]	29.58 (4.64)	[27.98, 31.17]	.66
SRPS Control	52.29 (6.33)	[50.31, 54.56]	52.49 (6.53)	[50.58, 54.40]	.70

Note. *M* = mean, *SD* = standard deviation, CI = confidence interval.

Hypothesis 1

Young adult Black women receiving S2S will have a significant increase in condom use from baseline to post-intervention, in comparison to those in the control group.

Two generalized estimating equations (GEE) were utilized to determine any differences in condom use between groups by time. The first GEE analyzed condom use always, sometimes, or never (Table 6.10). The second GEE analyzed condom use during last sexual encounter (Table 6.11).

Only condom use during vaginal sex with a main partner was assessed. This is because less than 50% of study participants engaged in vaginal sex with a casual partner, anal sex with a main or casual partner, or oral sex with a casual partner. Although more than 50% of participants engaged in oral sex with a main partner, there were not enough participants in the *condom used always* or *condom used sometimes* categories for the model to properly converge. There was no significant group by time difference in condom use (always, sometimes, never) during vaginal sex with a main partner ($p = .60$). This suggests the increase in condom use during sex with a main partner was the result of something other than the intervention.

Table 6.10

Generalized Estimating Equation for Condom Use During Vaginal Sex with Main Partner

Parameter	B	Std. Error	95% Confidence Interval		p
			Lower	Upper	
Group	-3.830E-16	0.47	-0.93	0.93	1
Time	0.11	0.33	-0.54	0.76	.73
Group * Time	0.22	0.41	-0.59	1.02	.60

While there was a time effect on the use of condoms at last vaginal sexual intercourse with a main partner ($p = .05$), there was no significant group by time difference in condom use during last vaginal sex with a main partner ($p = .55$). This suggests the intervention was not the cause of the increased reports of condom use at last sex with a main partner. As there was no significant time by group interaction, the null hypothesis was accepted and the hypothesis was rejected.

Table 6.11

Generalized Estimating Equation for Condom Use During Last Vaginal Sex with Main Partner

Parameter	<i>B</i>	Std. Error	95% Confidence Interval		<i>p</i>
			Lower	Upper	
Group	0.37	0.50	-0.61	1.35	.46
Time	0.62	0.32	-0.00	3.83	.05*
Group * Time	-0.26	.44	-1.12	0.60	.55

* $p \leq .05$.

Hypothesis 2

Young adult Black women in the S2S group will have significant increases in condom use self-efficacy, condom use intentions, and sexual relationship power from baseline to post-intervention, in comparison to those in the control group.

The results of the repeated measures ANOVA showed a significant time effect for CUSES Mechanics scores, $F(1, 85) = 14.87, p = .00$. This time effect occurred because study participants in both groups had higher scores at follow-up than at baseline. There was also a significant group effect for the CUSES Mechanics scores, $F(1, 85) = 4.05, p = .05$. The group effect occurred as a result of the intervention group scores being higher than those of the control group at baseline and follow-up. However, the time by group interaction was not significant, $F(1,$

85) = 0.00, $p = .98$. This indicates that the intervention did not significantly influence the changes in scores of the CUSES Mechanics from baseline to follow-up, as both groups experienced comparable changes in scores over time. There was no significant time effect, $F(1, 85) = 0.58, p = .45$; group effect, $F(1, 85) = 0.87, p = .36$; or time by group interaction, $F(1, 85) = 2.12, p = .15$, for the CUSES Assertiveness subscale.

The only significant finding for the SRS Intention subscale was a time effect, $F(1, 85) = 9.23, p = .00$. There was a statistically significant increase in overall intention scores between baseline and follow-up. However, there was no significant group effect, $F(1, 85) = 0.01, p = .94$, or time by group interaction, $F(1, 85) = 0.96, p = .33$. As with the results of the CUSES Assertiveness subscale, the SRPS Control subscale showed no significant findings on the repeated measured ANOVA for time, $F(1, 85) = 0.54, p = .47$; group, $F(1, 85) = 0.03, p = .86$; or time by group, $F(1, 85) = 0.60, p = .44$. Data representing the time effects, group effects, and time by group interactions for all subscales are presented in Table 6.12.

Table 6.12

Results of Repeated Measures ANOVA Within and Between Subjects Contrasts

Interaction	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>
CUSES Mechanics subscale					
Time	73.34	1	73.34	14.87	.00**
Time * Group	0.01	1	0.01	0.00	.98
Error (Time)	419.11	85	4.93		
Group	84.29	1	84.29	4.05	.05*
Error	1768.20	85	20.80		
CUSES Assertiveness subscale					
Time	0.73	1	0.73	0.58	.45
Time * Group	2.68	1	2.68	2.12	.15
Error (Time)	107.49	85	1.27		
Group	3.65	1	3.65	0.87	.36
Error	358.04	85	4.21		
SRS Intention subscale					
Time	71.03	1	71.03	9.23	.00**
Time * Group	7.37	1	7.37	0.96	.33
Error (Time)	654.09	85	7.69		
Group	0.31	1	0.31	0.01	.94
Error	4545.83	85	53.49		
SRPS Control subscale					
Time	6.92	1	6.92	0.54	.47
Time * Group	7.78	1	7.78	0.60	.44
Error (Time)	1099.78	85	12.94		
Group	2.10	1	2.10	0.03	.86
Error	5919.02	85	69.64		

* $p \leq .05$, ** $p \leq .00$.

Hypothesis 3

Hypothesis 3 states, *At post-intervention, condom use among young adult Black women will be associated with condom use self-efficacy, condom use intentions, sexual relationship power and socio-demographic characteristics.*

To determine predictors of condom use among study participants at baseline and follow-up, multinomial logistic regressions were utilized. Vaginal sex with a main partner was used as the dependent variable at both time points because it was the most frequently reported sex at baseline and follow-up (see Table 6.7). All secondary outcomes measures (self-efficacy, intention, power) were included in the models. Select demographic characteristics (age, education level, and STD history) were also included in the models. In addition, group assignment was added to the predictor variables for the follow-up analysis.

At baseline, condom use intention was a predictor of condom use among participants who always or sometimes used condoms during vaginal sex with a main partner. For every one-point increase in baseline intention to use condoms, the odds of a participant always using condoms during vaginal sex with a main partner are almost twice as likely as those who never use condoms during vaginal sex with a main partner (*OR* 1.94, *CI* = 1.33, 2.81, *p* = .00). Similarly, for every one-point increase in intentions at baseline, the odds of a participant sometimes using condoms during vaginal sex with a main partner are almost one-third as likely as those who never use condoms during vaginal sex with a main partner (*OR* 1.29, *CI* = 1.08, 1.53, *p* = .01). No other secondary outcomes or socio-demographic characteristics were found to be significant predictors of condom use during vaginal sex with a main partner at baseline. Table 6.13 provides the results of the baseline multinomial logistic regression.

Table 6.13

Baseline Predictors of Condom Use During Vaginal Sex with a Main Partner

Condom Use	B	OR	95% Confidence Interval		p
			Lower Bound	Upper Bound	
Always					
Age	0.15	1.66	0.14	9.82	.89
Education (high school)	-1.40	0.25	0.02	3.35	.29
Education (some college)	-0.43	0.65	0.08	5.04	.65
STD History	1.09	2.98	0.37	23.94	.31
Self-efficacy (mechanics)	0.07	1.07	0.80	1.44	.63
Self-efficacy (assertiveness)	-0.13	0.88	0.48	1.62	.69
Intention	0.66	1.94	1.33	2.80	.00**
Power	0.10	1.10	0.93	1.30	.26
Sometimes					
Age	0.50	1.65	0.29	9.50	.58
Education (high school)	-0.14	0.87	0.14	5.49	.88
Education (some college)	-0.01	0.99	0.20	4.82	.99
STD History	0.20	1.22	0.31	4.82	.77
Self-efficacy (mechanics)	0.09	1.10	0.89	1.35	.40
Self-efficacy (assertiveness)	-0.27	0.76	0.53	1.08	.13
Intention	0.25	1.29	1.08	1.53	.01*
Power	-0.00	1.00	0.90	1.10	.95

Note. The reference category is: Never.

* $p \leq .05$, ** $p \leq .00$.

At follow-up, intentions predicted condom use only for those participants who reported always using condoms during vaginal sex with a main partner. For every one-point increase in intentions, the odds of a participant always using condoms during vaginal sex with main partner

were 1.6 times as likely as those who never used condoms during vaginal sex with a main partner (*OR* 1.60, *CI* = 1.18, 2.15, $p = .00$). Moreover, self-efficacy (assertiveness) also was found to be a significant predictor of condom use during vaginal sex with a main partner at follow-up. For every one-point increase in follow-up assertiveness, the odds of a participant sometimes using condoms during vaginal sex with main partner were approximately half the odds of participants who never use condoms during vaginal sex with a main partner (*OR* 0.49, *CI* = 0.26, 0.94, $p = .03$). No other secondary outcomes or socio-demographic characteristics were significant predictors of condom use during vaginal sex with a main partner at follow-up. There were no significant differences noted between the study groups for those who reported always using condoms ($p = .65$) or sometimes using condoms ($p = .84$). Table 6.14 provides the results of the follow-up multinomial logistic regression model.

Table 6.14

Follow-Up Predictors of Condom Use During Vaginal Sex with a Main Partner

Condom Use	B	OR	95% Confidence Interval		p
			Lower Bound	Upper Bound	
Always					
Age	-0.29	0.97	0.12	7.78	.98
Education (high school)	-1.55	0.21	0.02	2.33	.20
Education (some college)	-0.74	0.48	0.08	3.01	.43
STD History	0.77	2.16	0.36	13.14	.40
Self-efficacy (mechanics)	-0.54	0.95	0.70	1.28	.73
Self-efficacy (assertiveness)	-0.23	0.80	0.41	1.55	.50
Intention	0.46	1.60	1.18	2.14	.00**
Power	0.24	1.03	0.91	1.15	.67
Group	0.36	1.44	0.30	6.81	.65
Sometimes					
Age	-0.49	0.61	.06	5.83	.67
Education (high school)	1.04	2.83	0.23	34.61	.42
Education (some college)	0.23	1.27	0.14	11.15	.83
STD History	-1.22	0.30	0.06	1.57	.15
Self-efficacy (mechanics)	0.18	1.20	0.85	1.69	.31
Self-efficacy (assertiveness)	-0.71	0.49	0.26	0.94	.03*
Intention	0.20	1.22	0.96	1.54	.10
Power	0.12	1.13	0.99	1.29	.08
Group	0.17	1.19	0.23	6.22	.84

Note. The reference category is: Never.

* $p \leq .05$, ** $p \leq .00$.

Neither the baseline nor follow-up regression models identified all secondary outcomes as predictors of condom use. However, one or more secondary outcomes were identified as predictors of condom use in each model. Thus, the null hypothesis was partially accepted and the hypothesis was partially rejected.

RAB Follow-Up Meeting

The RAB members were helpful in not only the adaptation of the S2S intervention, but also in the interpretation of the phase two study results. Following phase two data analysis, all RAB members were invited to attend a follow-up meeting in order to discuss these findings. Three RAB members attended the follow-up meeting. Direct quotes from these RAB members and one of the study research assistants (RAs) are presented throughout the remainder of this chapter. These comments underscore the interpretation of major study findings and support some of the study strengths and weaknesses discussed in chapter 7.

Recruitment

When discussing the possible reasons for high recruitment from Facebook and email, versus the low recruitment from Craig's List and Twitter, the RA stated, "Craig's List is for creepers." The RAB members in attendance agreed with her sentiments. Charlotte also gave her thoughts on the success of Facebook recruitment. "Like if you see a Facebook ad, usually you're not like, 'oh.' Like, you're not wondering about, like, the credibility of the person behind it. Like, you know it's credible so, that's probably another reason why Facebook was good."

Snowballing was the only form of recruitment that yielded a higher number of participants than Facebook posts or advertisements. Delilah expressed the pros of snowballing persuasively, "say you have a girl, um, and she found out about this study... If she gets her

girlfriend to agree to do it with her, she will probably do it.” She went on to discuss the cons of snowballing,

They could be talking, you know. Like, “hey, what’s going on?” or “well, I didn’t get that.” “Okay, well you know, we’ll just exchange messages,” or whatever. Like, “you show me what you get, I’ll show you what I get.”

In this sense, snowballing may lead to group contamination. The RA in attendance at the follow-up meeting also commented on the possibility of group contamination,

One person's comment was like “Oh, I showed all my friends, like, the video.” So maybe all those friends were—were, like, close—they’re probably in the study together. So then, maybe, like, some were in the control group, so they showed the—that video to the control group.

This idea of possible group contamination and potential strategies for prevention will be discussed in chapter 7.

Intervention Acceptability/Feasibility

Acceptability. RAB members were pleased with the phase two acceptability findings. Charlotte commented, “I’m just happy about the results... I feel like we worked hard on, like, making the text messages and, like, most of the comments were, like, positive... So I—I don't know, it feels nice.” In a similar sentiment, Delilah stated, “Makes me feel good, like we’re of service to those little ladies out there in need.”

Message delivery. When discussing the potential reasons that four intervention group participants (9.5%) did not receive any memes or pictures, Charlotte commented that it is sometimes difficult to receive pictures via text message when the message recipient is not connected to Wi-Fi. RAB members also talked about the differences between smartphones and

older model phones. One of the RAs made this issue clear by stating, “Some phones like, they won't accept—like, they just can't pick up pictures or videos. Maybe that could have been a reason, the out-of-date phones.”

Video views. RAB members were asked to compare the number self-reported video views with the number of video plays and finishes noted by the video streaming platform. Charlotte suggested that social desirability might have been the cause of the discrepancy between the objective and subjective video data. “Usually people don't wanna admit when they didn't do it. So, like they can just be like, ‘oh yeah, I watched all of it.’ Like, so, it could also be, like, kind of feeling guilty, covering their tracks.” She later suggested that the text message intervention could be improved by allowing participants to choose whether or not videos will be included in their messages. She said, “maybe we could have an option for people who would like videos or who wouldn't like videos, and instead of the videos, have, like, a text message that, like, has, like, the same information.”

Delilah suggested that video finishes should not be associated with watching the full videos. She compared watching videos on a mobile device to the manner in which she listens to music on her phone.

I'm on the phone listening to music and the song's about to go off, I will turn. Like, when the chorus is dragging on or maybe somebody's, like, talking during the outro or something, I'll, like, just turn it off..

In this sense, the participants could have watched all but the last few seconds of the video. Thus, video watches, and not video finishes, should be assessed when determining the number of videos viewed by intervention participants.

Primary and Secondary Outcome Findings

RAB members were asked about the potential reasons for the lack of group differences in the primary and secondary outcomes. One of the RAs commented on the potential for response bias. As she stated,

It may be they remembered, “Oh hey, the beginning questions talk about sex,” so maybe they caught on, what it was about. And then, they wanted to, like, change their answers to make it, like, sound, like, they changed or something like that.

The RAB members agreed with this statement. Moreover, Charlotte believed the decrease in sexual activity between both groups might have been a result of participants ending their sexual relationships while in the study. She mentioned that “...relationships come and go and, like, I don't know, sometimes you get in a drought, like, it seems kind of a dry spell.” She went on to specifically mention the low likelihood that the intervention caused these changes in sexual activity, “it could be because of intervention but, the similarities show—I feel like show that it's just, like, the—the ins and outs of being a single lady in Los An—or not in Los Angeles, in America.”

Delilah also identified the high education level of phase two participants as one potential reason for the lack of group differences. As she put it,

I'm thinking maybe—because a couple of the messages said, like, they felt like the information—um, like they already knew the information. And I think that could be due to like the, um, different education levels, like a lot of the people could have been enrolled in college, so, maybe, they just felt as though it didn't [significantly] increase their knowledge base.

RAB Experience

During the follow-up meeting, the RAB members expressed their thoughts related to their participation on the RAB. Charlotte stated, “Thank you for giving the opportunity for, like, being a research advisory board... It was a fulfilling experience.” Delilah agreed, “This was a great experience. I've never, um, done, like, a intervention like this. I don't know, I just thought it was really cool. And we did put a lot of work into it.” Grace declared, “Remember I said I was thinking like, ‘should I go?’ ...It turned out pretty nice. I was happy I came.”

These positive responses from the follow-up meeting attendees echoed the responses made by other RAB members during phase one. As part of introductions for participants who attended RAB meeting #5, each RAB member was asked to state what she liked most about being a member of the RAB. Brooklyn commented, “I really appreciate how aware it’s making me. Um, just another consciousness about things. ‘Cause a lot of times you just go through the motions and not really think about everything that we’re learning, and I appreciate that.” Faith added, “I enjoy being a part of this research advisory board because it has been both informative and fun.”

Summary

The findings of this study indicate that the text messages were well received by participants. While there were some suggestions for improvement, the overwhelming responses to the open-ended questions on the acceptability/feasibility instrument were positive. Furthermore, the objective feasibility findings showed that the intervention worked well. And, the preliminary outcomes of the study showed a decrease in vaginal, anal, and oral sex with main and casual partners. Increases in self-efficacy and intentions were also identified. Finally, the theoretical constructs of intention and self-efficacy and the socio-demographic character of age

were noted as predictors of condom use during vaginal sex. These findings provide support for continued assessment of text message adaptation of evidence-based intervention. Chapter 7 presents a more in-depth discussion of the study findings, strengths and limitations, and implications for research and practice.

CHAPTER 7 - DISCUSSION

This two-phase, mixed methods study assessed the acceptability, feasibility, and preliminary outcomes of S2S, a newly adapted sexual health text message intervention among young adult Black women. The ADAPT-ITT Model (Wingood & DiClemente, 2008) was used to guide both phases of this study. Aspects of community-based participatory research (CBPR) were also utilized. Phase one was comprised of meetings with a research advisory board (RAB). These meetings were the basis for the intervention adaptation. Topical experts, a focus group of young adult Black women, and a community advisory board (CAB) of HIV educators and researchers were also consulted during the intervention adaptation. Phase two involved a randomized, controlled pilot study of S2S.

Findings from the pilot study showed that S2S was acceptable and feasible for use among young adult Black women. Anticipated findings such as increased condom use, self-efficacy, intentions, and power were observed in each study group. However, study hypotheses were rejected due to lack of significant group differences over time. RAB members assisted with the interpretation of findings. Their feedback helped to identify potential rationales for the expected *and* unexpected outcomes of the study. This chapter provides a succinct, yet thorough discussion of the study results, interpretation of those results, and implications for clinical practice and future research.

Recruitment

The recruitment efforts used for the RAB and focus group helped to inform the recruitment methods that were used in phase two of this study. Online recruitment methods were utilized as a result of the high use of social media among young adult Black women (Smith, 2014). The success of online recruitment efforts yielded the required number of study

participants in a fairly short period of time. This is in line with the recruitment findings of several other studies (Bauermeister et al., 2012; Bull, Vallejos, Levine, & Ortiz, 2008; Child, Mentes, Pavlish, & Phillips, 2014; Mendelson, 2007; Ramo & Prochaska, 2012; Richiardi, Pivetta, & Merletti, 2012). Specifically, online recruitment for this study was far more successful than face-to-face recruiting methods. This was also the case with the recruitment findings of Close, Smaldone, Fennoy, Reame, and Grey (2013).

Differences were observed in the effectiveness of the online recruitment strategies. The most effective forms of online recruitment were email and Facebook. One-third of phase two participants were recruited from Facebook advertisements and posts, while another one-quarter were recruited from mass emails sent to college clubs. Conversely, no participants were recruited from Craig's List or Twitter. Based on the feedback from the RAB members, Facebook advertisements are more trustworthy than advertisements viewed on other social media websites. This high level of trustworthiness resulted in high recruitment rates from this online platform.

The highest percentage of phase two participants was recruited using snowballing methods. More than 40% of all phase two participants first learned of the study from someone they knew. This high rate of snowballing could be related to potential contamination. This issue will be discussed later in this chapter.

Surprisingly, none of the phase one participants were recruited from the flyers that were handed out at hair salons or other public locations. Hair salons were originally thought to be an optimum location for recruitment, based on the sacred environment of these salons and the trust between stylists and clients (Browne, 2006). Prior researchers have found that more than one-third of Black women visit a hair salon every week or every other week (Hall et al., 2013). Moreover, almost one-fifth of conversations between Black hair stylists and their clients are

related to health (Linnan & Ferguson, 2007). Also, Black women have previously been recruited for health studies from Black hair salons (Arthur Ashe Institute for Urban Health, 2016; Browne, 2006).

Recruitment may have been low at hair salons because of the various salons' clientele. The socio-demographic nature of the salons' clients was not assessed prior to flyer distribution. Whereas the Facebook advertisement was shown only to young women who met age, ethnicity, and gender criteria for the study, the hardcopy recruitment flyers were placed in businesses where the client demographics were unknown. Recruitment may have been more successful in hair salons if flyers were placed strategically in locations with high rates of young adult Black clients.

The sensitive nature of sexual health, may have added to the difficulty of recruiting participants via hardcopy flyers placed in hair salons. As suggested by the RAB, the term "*sexual health*" was removed from the original flyer and replaced with "*women's health*." The inability of potential participants to read the flyer privately may have also aided in the difficulty of hair salon recruitment. Even if no other clients were in the salon when a potential participant read the recruitment flyer, her hair stylist would have seen her pick up a flyer that required study participants to be sexually active and unmarried. Thus, the risk of leaving a negative impression with oneself with a hair stylist or other clients in the salon may have prevented potential study participants from taking a flyer from the hair salon. On the contrary, participants recruited via online strategies received the flyer privately via email, Facebook, etc. Using this strategy there was no concern for public embarrassment or judgment.

It is unknown whether the response to the hardcopy flyers would have been more positive if potential participants had received the information directly from a member of the study team.

Because the flyers were left at the hair salons, the study team was unable to immediately address the concerns of potential study participants. Engaging with participants in the hair salons would have allowed them to ask any pertinent questions. This may have, in turn, increased the number of study participants who were recruited from local hair salons.

The Intervention Adaptation Process

Using a CBPR Approach

During phase one, a RAB of young adult Black women ($n = 7$) was formed to assist in the adaptation of S2S, provide feedback on phase two recruitment and data collection strategies, and help interpret the phase two study findings. These young women were recruited using online methods including email and social media. A total of six RAB meetings were held—five meetings prior to phase two recruitment and the final meeting after phase two data collection. Additionally, a focus group of young adult Black women was recruited via email and social media ($n = 5$). The purpose of the focus group was to provide feedback on the S2S text message intervention. The information gained from the RAB and focus group participants was essential to the adaptation of the Sister to Sister intervention.

The use of CBPR aspects in the adaptation of the S2S intervention was beneficial to the PI, as well as the RAB participants. The PI gained a wealth of knowledge related to popular activities, current trends, and frequently used lingo of young adult Black women. This information was useful in designing the phase two recruitment methods and in adapting the intervention. The comments of the RAB assisted the PI in maintaining the age, cultural, and gender-appropriateness of the adapted intervention. The RAB members' thoughts on phase two acceptability, feasibility, and primary/secondary outcome findings were also a welcomed addition to the PI's interpretation of the study results.

Just as the study PI learned from the feedback of the RAB members, the RAB members also learned from the PI while participating in this study. This bidirectional learning was beneficial for the PI and the RAB members alike. As participants in the study, RAB members were sensitized to their own sexual health status. On several occasions, they spoke of their positive experiences as RAB members. These experiences allowed them to reflect on their own sexual health, while helping to adapt an intervention to improve the sexual health of their peers.

Model Modification

The ADAPT-ITT model (Wingood & DiClemente, 2008) was modified to include adaptations and reviews by several groups. Instead of using the RAB only, feedback was also gathered from a focus group and CAB. Following meetings with each group, the panel of topical experts was notified of suggested intervention changes. A new iteration of the adapted intervention was never completed without first integrating the comments of the topical experts. Using three different groups (e.g. RAB, focus group, and CAB) helped to increase the rigor of the adaptation process and improved the intervention design to ensure cultural appropriateness. Other researchers can use this modified ADAPT-ITT model to guide their adaptation processes.

Intervention Design

The S2S text message intervention began as a 12-week high-risk sexual behavior (HRSB) prevention intervention and was revised to become an eight-week intervention. Study-related text messages were sent to intervention and control group participants every Monday, Wednesday, and Friday throughout the duration of the intervention. The text messages included both SMS and MMS messages. The intervention group received seven text-only messages, seven videos, seven memes, and three pictures. The text-messages were designed as part of a one-way standardized intervention. As such, participants did not receive responses to any replies sent to

the text-messaging platform. The frequency, use of both SMS and MMS text messages, duration, and one-way direction of the S2S text message intervention was consistent with various aspects of text messages interventions created by Gold, Aitken, et al. (2011), Suffoletto et al. (2013), and Juzang et al. (2011).

The intervention was designed to include a breadth of information without saying the same thing more than once. During phase one, members of the RAB were clear that they did not want the intervention to include heavy repetition of the same concepts. One intervention group participant emphasized this notion on the follow-up survey, by suggesting greater diversity of the text message content. As discussed in chapter 4, each of the 24 S2S text messages were separated into one of nine content categories. Between one and seven messages were created for each category. Even among the content category with seven messages, the information provided in the messages was not repetitive. That is to say, although participants may have received several messages dealing with the same content matter, they never received the same information twice. The non-repetitive design of the S2S intervention was consistent with several studies that provided examples of their text messages (Gold, Aitken, et al., 2011; Gold, Lim, et al., 2011; Jamison et al., 2013; Juzang et al., 2011; Reback et al., 2012).

Text messages were also ordered so that various types of text messages were evenly dispersed throughout the intervention. For example, myth/fact memes were sent an average of once per week, rather being sent in clusters at the beginning or end of the intervention. Likewise, video links were typically sent once per week, instead of being sent several times per week. This mixing of short message service (SMS) and multimedia messaging service (MMS) text messages was done to prevent burnout or boredom with any specific text message format.

Major Study Findings

During phase two, young adult Black women ($N = 92$) were recruited and randomized to either the intervention ($n = 45$) or control group ($n = 47$). Baseline and follow-up surveys were completed and submitted online. Intervention feasibility was measured by self-reported data and objective data gathered from EZ Texting and Vimeo, the respective online text messaging and video streaming platforms. Intervention acceptability and outcome variables were based solely on self-reported data. A discussion of the study acceptability and feasibility findings is presented here.

Acceptability Findings

Acceptability and feasibility of the intervention was supported, as reflected in the high acceptability/feasibility instrument scores of the intervention group. These scores were close to the highest possible rating, indicating that the intervention was overwhelmingly acceptable among participants. The high acceptability of the intervention is consistent with other text message studies (Gold, Lim, et al., 2011). In addition, the open-ended responses related to the intervention were generally positive. The number of text messages sent and their frequency were similarly found to be acceptable, supporting the structure of the intervention as developed for this study. Thus, the individual comments regarding changes in the number of text messages, or the frequency and duration of the text messages can be treated as a minority opinion.

While the delivery of the S2S should remain the same, some suggestions for improvement should be considered. For instance, one participant suggested additional message tailoring. Such tailoring could include messages that are specific to the participants' age group (i.e. 18 to 19 years vs. 20 to 24 years), type of sexual activity (vaginal, anal, or oral sex), and type of sexual partner (main or casual). In these cases, participants who are 20 to 24-years-old

would not receive messages with data specific to 18 to 19-year-old women. Likewise, participants who engaged in vaginal and oral sex would not receive messages regarding anal sex. Moreover, those who are in a sexual relationship with a main partner would not receive messages intended for those who engage in casual sexual relationships. Participants who receive these types of tailored messages may feel that the intervention more personal than an intervention that simply uses targeted messages.

Message tailoring can also include individual preferences related to the day and time during which text messages are delivered. Participants can select a time during which they are least distracted by people or tasks. This type of autonomy over the intervention may increase the rate of messages read and videos rated. Additionally, messages can be tailored based on the participants' HRSB. Risk can be determined from the results of baseline study surveys or other enrollment surveys. Participants can then receive text messages that are specific to their level of risk. Though tailored text message interventions are documented as more effective than non-tailored interventions (Head et al., 2013), it is unclear whether tailoring would have affected the primary and secondary study outcomes of this study. However, message tailoring can be implemented as one of the future modifications of the S2S text message intervention.

Another suggestion for improvement is including more interactive content. Upon hearing that phase two participants suggested more interactivity, RAB participants suggested the inclusion of matching games and quizzes. While quizzes are typically used in teaching/learning environments as tools for evaluation, games can be used for instruction or formative evaluation (Oermann & Gaberson, 2013). Games are useful ways to increase learner involvement and active participation (Bastable, 2008; Billings & Halstead, 2013; McKeachie & Svinicki, 2013). They also promote retention of learning that lasts longer than traditional instructional methods like

lecturing. Lastly, games are fun, yet purposeful and easily modifiable (Bastable, 2008). The addition of games or similar interactive activities to the S2S text message intervention would require a change from the intervention's current one-way message design to a two-way design. This can be accomplished using automated replies to incoming game-related text messages.

Feasibility Findings

More than three-quarters of the intervention group participants received all of the text messages. Lack of smartphones may be a reason for inability to receive memes and pictures. Data on mobile phone brands and models were not collected during this study. However, if the inability to receive MMS messages was related to ownership of older mobile phones, it would be consistent with the Pew Research Center data showing that 15% of 18 to 29-year-olds don't have smartphones (Smith, 2015).

One of the most surprising feasibility findings was the low rate of videos watched by intervention participants. In both the RAB and focus group meetings, the intervention videos were found to be the most important aspect of the original Sister to Sister intervention. Those who attended these meetings overwhelmingly encouraged the inclusion of videos snippets. So, it was difficult to understand why five of the seven videos were played by less than half of the intervention group participants. Some of the open-ended responses from the invention group participants and the comments of the RAB participants helped to shed some light on this matter.

Several intervention participants mentioned that they received the videos at times when they could not watch them immediately, but forgot to watch the videos at a later time. And, as suggested in the first RAB meeting, others may not have watched the videos because of concerns about using too much data.

RAB members suggested that the intervention be modified so that videos would be sent straight to intervention participants' phones, removing the requirement to click on a link to view the video. It was agreed among all RAB members that the fewer link clicks in the intervention, the better. Although, this type of tailoring may increase the rate of video watches among participants, modeling is an important aspect of the original Sister to Sister intervention. As such, videos should not be completely removed from any Sister to Sister adaptations.

Finally, there was a question of the discrepancy between the feasibility data reported by the message platform and that which was self-reported by the intervention group participants. With self-reported data, there is always the chance of study participants altering their responses to reflect the types of responses they assume the researcher is looking for. This phenomenon is commonly known as social desirability. It could also be the case that some intervention participants watched the videos with other intervention participants. So, the video could have been played only once, while multiple participants were watching. This raises the issue of contamination, as it is believed that the sample included groups of friends.

Primary and Secondary Outcome Findings

Condom use. In considering the outcomes of the pilot study, participant reports of vaginal, anal, and oral sex with main and casual partners decreased between baseline and follow-up. What's more, reports of condom use increased among those who remained sexually active. There was no significant difference in reports of sexual intercourse or condom use between the intervention and control groups. Still, decreased sexual encounters and increased condom use are desirable outcomes in the correct direction. Several factors may have contributed to the lack of significant group differences; these factors may be related to the intervention, the participants or a combination of both.

It is generally thought that positive behavior changes among intervention group participants are the result of a successful behavior-change intervention. However, with the same level of decreased HRSB in the intervention group and control group, the intervention cannot be the sole reason for this change. Reasons for the decrease in HRSB in the control group participants are not well understood. This decrease may be related to increased sensitization to HRSB as a result of baseline survey completion. Such sensitization may cause participants in either study group to decrease their HRSB while in the study. Response bias also may have contributed to the insignificant group differences.

While new relationships were not assessed on the follow-up survey, it is quite possible that the main or casual partners identified by participants at baseline were not the same main or casual partners identified at follow-up. In this instance, increased condom use would be an expected outcome, as condoms are more frequently used among partners in a new sexual relationship than among partners in a long-term, trusting, and satisfying relationship (He, Hensel, Harezlak, & Fortenberry, 2016).

Consistent with findings of the current study, two of the HRSB text message interventions highlighted in chapter 2 reported no significant decreases in HRSB between baseline and follow-up assessments (Jamison et al., 2013; Juzang et al., 2011). Furthermore, the only *Compendium* intervention to report significant time by group interactions for all measures of immediate post-intervention condom use is Wechsberg et al. (2004). Although many intervention effects were noted among the remaining *Compendium* and HRSB text message interventions, these interactions did not occur for each measurement of condom use at each data collection point. Thus, non-significant findings at one data collection point may not be associated with non-significant findings at every other data collection point.

Theoretical constructs. Scores of all instruments used to measure secondary outcomes among study participants either increased or remained the same between baseline and follow-up. No time by group interactions were noted. Significant time effects were noted among the self-efficacy (mechanics) and intention scores in both study groups. As previously stated, the reason for changes in both groups could be related to sensitization or response bias. It is also possible that taking the baseline survey caused participants in both study groups to become more aware of their self-efficacy, intentions, and power, leading to a more accurate score on the follow-up survey than on the baseline survey. As such, their perceptions of their ability to properly place a condom on their partner and to be intentional about condom use may have changed. No significant time effects were identified in the self-efficacy (assertiveness) or power outcomes.

It is important to note that self-efficacy (mechanics) and intention are constructs that are under the study participants' volition. On the other hand, self-efficacy (assertiveness) and power are constructs that require the involvement of the participants' sexual partners. So, even if the study participants attempted to display more assertiveness and power in their relationships, they may have faced opposition from their partners. Also, depending on the type of sexual relationship they were in (i.e. main or casual), participants may not have cared to be assertive or may not have wanted to display much power. The idea of the male partner maintaining most of the power in the relationship may be a societal norm to which some study participants ascribe, however, support for this premise would require further investigation.

Support of the theoretical framework. At baseline, condom use intention was a significant predictor of condom use during vaginal sex with a main partner among all study participants. This finding was noted among participants who always used condoms, as well as those who sometimes used condoms. As expected, there was a positive correlation between

intention and condom use. As intention scores increased, the likelihood of using condoms sometimes or always increased accordingly. These findings support the use of the Theory of Planned Behavior (TPB) as an appropriate theory for HRSB change.

At follow-up, intention remained a predictor of condom use among those who always used condoms during vaginal sex with a main partner. As such, the use of TPB was again supported at follow-up. However, two unforeseen results were also found. First, intention was not predictive of condom use for those who sometimes used condom during vaginal sex with a main partner at follow-up. Second, self-efficacy (assertiveness) was a stronger predictor of never using condoms during vaginal sex with a main partner, than of sometimes using condoms during vaginal intercourse with a main partner.

The change in condom use predictors from baseline to follow-up was unexpected and may seem counterintuitive at first glance. One possible explanation is that the behavior of some participants changed over time from sometimes using condoms at baseline to always using them at follow-up or not reengaging in vaginal intercourse at follow-up. Among those who engaged in vaginal sex with a main partner at baseline and at follow-up, the percentage of participants who never used condoms remained virtually unchanged. Yet, the percentage of participants who sometimes used condoms decreased and the percentage of participants who always used condoms increased. So, intentions may not have been predictive of inconsistent condom use at follow-up because almost half of those who were inconsistently using condoms at baseline, reported consistent use of condoms or no vaginal intercourse at follow-up.

In the same manner, there may have been a lower likelihood of inconsistent condom use at follow-up, compared to no condom use, because of the baseline to follow-up shift in condom users. Furthermore, it may take a higher level of assertiveness to convince a non-willing sexual

partner to sometimes use condoms than it takes to consistently engage in HRSB. In other words, if a couple has agreed to forgo condom use, they may not need high levels of assertiveness. Similarly, if a couple has agreed to use condoms consistently, they may not need to maintain high levels of assertiveness. However, when condom use is inconsistent, especially if one partner wants to use condoms and the other partner does not, high levels of assertiveness may be necessary to effectively persuade the dissenting partner to use condoms.

Sexual relationship power was not found to be predictive of condom use at either data collection point. Thus, the use of the Theory of Gender and Power was not supported as an appropriate theory for HRSB change.

Study Strengths and Limitations

The findings of this study should be considered in relation to its strengths and limitations. One of the major strengths was application of principles of CBPR as well as mixed methods in adapting and pilot testing the intervention. Members of the RAB were similar to the target population (age, ethnicity, gender), enhancing the likelihood that the design of the adapted intervention would be culturally- and developmentally-appropriate and acceptable for the intended audience. Further, recording the RAB meetings and reviewing the meeting notes and transcripts facilitated integration of the ideas expressed by members of the RAB. Sharing findings with RAB members and requesting their opinions about the interpretation of results is consistent with principles of CBPR and an important strategy for enhancing understanding about the meaning of data.

The study retention rate was uniquely high. Retention criterion for a best-level intervention in the *Compendium* is 70% retention (CDC, 2015a). The 98.9% retention rate for this study far exceeded that criterion. It was also higher than each of the *Compendium* and HRSB

text message interventions discussed in chapter 2. This finding may be related to the shorter follow-up period than in a number of other studies. The high retention rate may also be related to the use of online data collection that may have increased feelings of anonymity and confidentiality among participants. Another strength of this study was the use of an experimental design with repeated measures.

The difference in measurement period for sexual behaviors with main and casual partners at baseline (past 3 months) and follow-up (past 8 weeks) is a limitation of this study. However, the use of the same Likert scale for quantification of sexual activity rather than actual number of episodes of protected and unprotected sex decreases the potential impact of measurement period difference on outcomes. In future examinations of the S2S intervention, the sexual activity and condom use recall periods will be the same at baseline and all follow-up assessments.

Another study limitation is the high level of education among study participants. While only 45.5% of 18 to 24-year-old U.S. women report having some college, but no bachelor's degree (Census Bureau, 2012a), 59.1% of all phase two participants reported this same level of education. Furthermore, only 10.6% of U.S. young women, age 18 to 24, have a bachelor's degree, yet 23.9% of phase two participants had bachelor's degrees. More specifically, only 36% of 18 to 24-year-old Blacks are college students (Snyder, 2014). This number, which includes Black men and women, is more than 1.6 times less than the number of young Black women in this study who reported being college students. Thus, the high education level of the participants is inconsistent with the education levels of the U.S. Black population. As such, the study findings cannot be generalized to all young adult Black women. Future studies should specifically target young adult Black women who are not enrolled in college and may not have completed high school.

The possibility that participants in the intervention and control groups may have communicated with each other during the study, causing contamination of treatment conditions is another study limitation. This potential for contamination is related to the use of snowballing for recruitment of 40% of the sample. Unfortunately, there is no way to prevent or monitor message forwarding. Concern about contamination was raised when one participant reported sharing the intervention text messages with her friends in the open-ended items on the acceptability/feasibility instrument. This type of message forwarding has also been reported by participants in several other text message studies (Cornelius, Dmochowski, & Cato, 2010; Gold, Aitken, et al., 2011; Perry et al., 2012). In a non-study environment, sharing of this type of public health information is encouraged. However, sharing messages in a study environment may result in group contamination and skew study findings. Methods that may decrease the risk of group contamination are discussed below.

Implications for Practice and Research

The findings of this study have many implications for practice and future research. Most importantly, it is clear that text messages are an acceptable form of sexual health education among young adult Black women. While it is not suggested that text messages take the place of traditional face-to-face interventions, they may be an acceptable alternative for those who would like to receive them. Furthermore, although this study did not look at the use of text messages as a booster following traditional face-to-face HRSB interventions, this strategy may be an additional option for interested young women. The use of text messages as an intervention booster will require further research to determine effectiveness.

This study adds to the growing body of literature suggesting online recruitment is a successful method for enlisting research participants. No longer are researchers restricted to

handing out paper flyers to potential research participants. Social media, email groups, and listservs provide researchers with several options for study recruitment. These methods of recruitment are cost effective, though it may be time-consuming to search out potential groups that will support recruitment of its members. Still, the time spent contacting online groups should be consistent with the time spent establishing relationships with organizations that permit distribution of paper recruitment flyers. The major difference in hardcopy and softcopy recruitment is the potential reach of the flyers. In this study, it was discovered that softcopy flyers are shared more rapidly and more frequently than hardcopy flyers.

Moreover, when utilizing snowballing as a form of study recruitment, researchers should take precautions to prevent comingling of participants from different study groups. The simplest way to prevent group contamination related to snowballing is to ask participants how they learned of the study. This assessment should be made as early as possible, before participants enroll in the study (i.e. during the screening process). Potential study participants should be excluded from the study if they learned of the study from someone who is already enrolled in the study. Another way this can be accomplished is to cluster group assignments based on regional location. Perhaps all participants living in the West and Northeast are assigned to the one group, while those living in the Midwest and South are assigned to another group. This may not completely prevent group contamination, but it would help decrease the chances of participants from separate groups sharing information with one another. While randomization by subject is a stronger design than cluster randomization, the risks of study group contamination may outweigh the randomization of each subject.

Furthermore, TPB should continue to guide the design and evaluation of HRSB interventions. This theory has a long history of use among sexual health researchers. Its use in

theoretical frameworks for traditional and text message interventions continues to be supported. Other theories, especially distance-learning theories, should be assessed for use in mHealth interventions.

Summary

The results of this study support the feasibility of the S2S text message intervention and help to identify areas that may be improved prior to conducting an efficacy trial of the intervention. In particular, strategies will be enhanced to prevent contamination across groups and long-term follow-up evaluations will be implemented. It is important that women's health researchers and educators continue to adapt and evaluate interventions using technologically advanced methods of delivery. Text messaging is a promising method of delivery for evidence-based interventions aimed at the reduction of HRSB among young adult Black women. Intervention adaptation using other types of technology should be investigated as well.

APPENDICES

Appendix A

RAB Recruitment Flyer

Young Adult Black Women Needed for a Women's Sexual Health Research Advisory Board

Potential Research Advisory Board members should be heterosexual, 18-24 year old Black women who are not married, and who have been sexually active in past 3 months.



Research Advisory Board members will be required to attend three to four, 1.5 – 2 hour meetings, over a two month period of time.

Dinner and a \$20 gift card will be provided at each meeting

To learn more, contact Tiffany Montgomery
at 562-745-5033 or Tiffany.Montgomery@ucla.edu

This research is conducted under the direction of Dr. Deborah Koniak-Griffin, UCLA School of Nursing

Focus Group Recruitment Flyer

Young Adult Black Women's Opinions Needed to Evaluate a Women's Sexual Health Text Messaging Intervention

Participants should be heterosexual, 18-24 year old Black women who are not married, and who have been sexually active in past 3 months.



Participants will be asked to attend a 3-hour meeting. This meeting will be held on a date that is convenient for all participants.

Lunch and a \$50 gift card will be provided

To learn more, contact Tiffany Montgomery at 562-745-5033 or Tiffany.Montgomery@ucla.edu

This research is conducted under the direction of Dr. Deborah Koniak-Griffin, UCLA School of Nursing

Appendix B

RAB Screening Tool

UNIVERSITY OF CALIFORNIA, LOS ANGELES SCREENING CONSENT SCRIPT

S2S Young Women's Health Study

Answers in red are the answers that would make the potential participant eligible for the study

Thank you for calling regarding the S2S Young Women's Health Study. My name is Tiffany Montgomery and I am conducting the study. I would like to ask you a few questions in order to determine whether you may be eligible to participate on the research advisory board. Before I begin the screening I would like to tell you a little bit about the research.

This research study will examine the use of text messages as a form of health education. If you are eligible to participate in the study, you will be invited to attend several Research Advisory Board meetings during which you will help to design a women's health text message intervention.

Would you like to continue with the screening? *[If no, thank the person and hang-up]*

The screening will take about 5 minutes. I will ask you about your age, gender, ethnicity, relationship status, and sexual history. You do not have to answer any questions you do not wish to answer or are uncomfortable answering, and you may stop at any time. Your participation in the screening is voluntary.

Your answers will be confidential. No one will know your answers except me. I am not writing your answers to the screening questions. If you are eligible for the study, and you provide your verbal consent to participate, you will receive further information via email. The only information you give me that will be kept is your email address. If you are not eligible for the study, you will not be asked for your email address.

Would you like to continue with the screening? *[If no, thank the person and hang-up]*

1. What is your ethnicity?

Black/African-American

2. What is your gender?

Female/girl/women

3. How old are you?

18 - 24

4. Do you own a mobile phone with text messaging capabilities?

Yes

5. Do you share your mobile phone with another person?

No

6. Please do not answer the following 2 questions individually. When I am done asking them, you may say “yes” if one or more of the questions in the group apply:
- a. Are you married?
 - b. Are you planning to become pregnant in the next 6 months?

No

7. Again, please do not answer the following 2 questions individually. When I am done asking them, you may say “yes” if one or more of the questions in the group apply:
- a. Have you had vaginal or anal sex in the past 3 months?
 - b. Have had sex with more than 1 man in the past 3 months?

Yes

Thank you for answering the screening questions.

If eligible: You are eligible to participate in this study because you are a single, young adult Black woman, age 18-24, who is sexually active, and who owns a cellular phone with text messaging capabilities.

Do you have any questions about the screening or the research? I am going to give you a couple of telephone numbers to call if you have any questions later. Do you have a pen? If you have questions about the research screening, you may call me and I will answer your questions.

If you have questions about your rights as a research subject or if you wish to voice any problems or concerns you may have about the study to someone other than the researchers, please call the UCLA Office of the Human Research Protection Program at (310) 825-7122.

Thank you again for your willingness to answer my questions. Now we will move on to the verbal consent process.

STOP HERE

If not eligible: You are not eligible to participate in this study because _____.

Thank you again for your willingness to answer my questions.

Focus Group Screening Tool

UNIVERSITY OF CALIFORNIA, LOS ANGELES SCREENING CONSENT SCRIPT

S2S Young Women's Health Study

Answers in red are the answers that would make the potential participant eligible for the study

Thank you for calling regarding the S2S Young Women's Health Study. My name is Tiffany Montgomery and I am conducting the study. I would like to ask you a few questions in order to determine whether you may be eligible to participate in the focus group. Before I begin the screening I would like to tell you a little bit about the research.

This research study will examine the use of text messages as a form of health education. If you are eligible to participate in the study, you will be invited to attend a one-time-only focus group learn about a women's health text message intervention.

Would you like to continue with the screening? *[If no, thank the person and hang-up]*

The screening will take about 5 minutes. I will ask you about your age, gender, ethnicity, relationship status, and sexual history. You do not have to answer any questions you do not wish to answer or are uncomfortable answering, and you may stop at any time. Your participation in the screening is voluntary.

Your answers will be confidential. No one will know your answers except me. I am not writing your answers to the screening questions. If you are eligible for the study, and you provide your verbal consent to participate, you will receive further information via email. The only information you give me that will be kept is your email address. If you are not eligible for the study, you will not be asked for your email address.

Would you like to continue with the screening? *[If no, thank the person and hang-up]*

1. What is your ethnicity?

Black/African-American

2. What is your gender?

Female/girl/women

3. How old are you?

18 - 24

4. Do you own a mobile phone with text messaging capabilities?

Yes

5. Do you share your mobile phone with another person?

No

6. Please do not answer the following 2 questions individually. When I am done asking them, you may say “yes” if one or more of the questions in the group apply:
- a. Are you married?
 - b. Are you planning to become pregnant in the next 6 months?

No

7. Again, please do not answer the following 2 questions individually. When I am done asking them, you may say “yes” if one or more of the questions in the group apply:
- a. Have you had vaginal or anal sex in the past 3 months?
 - b. Have had sex with more than 1 man in the past 3 months?

Yes

Thank you for answering the screening questions.

If eligible: You are eligible to participate in this study because you are a single, young adult Black woman, age 18-24, who is sexually active, and who owns a cellular phone with text messaging capabilities.

Do you have any questions about the screening or the research? I am going to give you a couple of telephone numbers to call if you have any questions later. Do you have a pen? If you have questions about the research screening, you may call me and I will answer your questions.

If you have questions about your rights as a research subject or if you wish to voice any problems or concerns you may have about the study to someone other than the researchers, please call the UCLA Office of the Human Research Protection Program at (310) 825-7122.

Thank you again for your willingness to answer my questions. Now we will move on to the verbal consent process.

STOP HERE

If not eligible: You are not eligible to participate in this study because _____.

Thank you again for your willingness to answer my questions.

Appendix C

RAB Consent Form

University of California, Los Angeles

CONSENT TO PARTICIPATE IN RESEARCH

S2S Women's Health Study
Phase 1

Tiffany M. Montgomery, MSN, RNC-OB, C-EFM and Deborah Koniak-Griffin, RNC, EdD, FAAN, from the School of Nursing at the University of California, Los Angeles (UCLA) are forming a Research Advisory Board to assist in the planning of their new research study.

You were selected as a potential member of the Research Advisory Board because you are a single, heterosexual, young adult Black woman, age 18-24, who owns a mobile phone with text messaging capabilities. Your participation on the Advisory Board is voluntary.

Why is this study being done?

This research study will examine the use of text messages as a form of health education.

What will happen if I take part in this research study?

If you volunteer to participate in the Research Advisory Board, you will be asked to do the following:

- Complete a baseline demographic survey, including questions such as "Have you ever been pregnant," "Have you ever been diagnosed with an STD," and "Are you sexually active?" You will complete this survey online. Your responses will not be shared during the Research Advisory Board workgroups.
- Participate in three, 3-hour long workgroups. During the workgroups, you will participate in discussions that will help the researcher to design a women's health text message intervention.
- Complete an online instrument packet to help the researcher identify possible changes to made before distributing the packet in the next phase of the study.
- Assist the researcher in interpreting the study findings.

How long will I be in the research study?

Participation will take a total of about 2 months. The study will also involve one follow-up workgroup to be held within 12 months of the initial workgroup.

Are there any potential risks or discomforts that I can expect from this study?

The potential discomforts expected as a result of Research Advisory Board participation include potential embarrassment related to the discussion of sexual health information or distress if one realizes they are engaging in high-risk behaviors. To minimize discomforts, you will be advised to provide general information that is representative of young adult Black women and not information that is representative only of yourself. You will be asked to think of your friends, family, and colleagues when responding. You will also be provided with a list of Los Angeles County STD clinics, upon request.

Are there any potential benefits if I participate?

You will not directly benefit from your participation in the study.

The results of the research will help the researcher to adapt a face-to-face sexual health intervention to an intervention that can be delivered on a mobile phone.

Will I be paid for participating?

You will receive dinner at the beginning of each workgroup session. You will also receive a \$50 gift card at the completion of each workgroup session.

Will information about me and my participation be kept confidential?

Up to eight participants will be invited to participate in the Research Advisory Board. It may be possible to link demographic information with individual participants. All participants will be asked to keep what is said during the group discussion between the participants only. However, complete confidentiality cannot be guaranteed. Any information that is obtained in connection with the workgroups and that identifies you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be increased by: 1) removing all personal identifiable information from the workgroup transcripts, 2) keeping workgroup recordings on password protected digital recorders, and 3) destroying the recordings once the study is complete. A hired transcriptionist will transcribe the workgroup recordings. The transcripts will be used to document the accuracy of workgroup findings.

What are my rights if I take part in this study?

- You can choose whether or not you want to be in this study, and you may withdraw your consent and discontinue participation at any time.
- Whatever decision you make, there will be no penalty to you, and no loss of benefits to which you were otherwise entitled.
- You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can I contact if I have questions about this study?

• **The research team:**

If you have any questions, comments or concerns about the research, you can talk to the one of the researchers. Please contact:

Tiffany M. Montgomery, MSN, RNC-OB, C-EFM
Tiffany.Montgomery@ucla.edu
(562) 745-5033

Dr. Deborah Koniak-Griffin, RNC, EdD, FAAN
dkoniak@sonnet.ucla.edu
(310) 206-3842

- **UCLA Office of the Human Research Protection Program (OHRPP):**

If you have questions about your rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call the OHRPP at (310) 825-7122 or write to:

UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694

VERBAL CONSENT:

By stating, "agree," you are indicating that:

1. You understand the information that has just been read to you
2. You voluntarily agree to participate as a member of the Research Advisory Board

If you do not wish to participate in the Research Advisory Board, please decline participation by stating, "disagree."

INSTRUCTIONS FOR THE PI:

If the potential participant agrees, take down their email address for future correspondence.

If the potential participant disagrees, thank them for their time.

Focus Group Consent Form

University of California, Los Angeles

CONSENT TO PARTICIPATE IN RESEARCH

S2S Women's Health Study
Phase 1 Focus Group

Tiffany M. Montgomery, MSN, RNC-OB, C-EFM and Deborah Koniak-Griffin, RNC, EdD, FAAN, from the School of Nursing at the University of California, Los Angeles (UCLA) are forming a focus group to assist in the planning of their new research study.

You were selected as a potential member of the focus group because you are a single, heterosexual, young adult Black woman, age 18-24, who owns a mobile phone with text messaging capabilities. Your participation on the Advisory Board is voluntary.

Why is this study being done?

This research study will examine the use of text messages as a form of health education.

What will happen if I take part in this research study?

If you volunteer to participate in the focus group, you will be asked to do the following:

- Complete a baseline demographic survey, including questions such as "Have you ever been pregnant," "Have you ever been diagnosed with an STD," and "Are you sexually active?" You will complete this survey online. Your responses will not be shared during the focus group.
- Participate in a one-time-only, 3-hour long focus group. During the focus group session, you will participate in discussions that will help the researcher to design a women's health text message intervention.

How long will I be in the research study?

Participation will take a total of about 3 hours.

Are there any potential risks or discomforts that I can expect from this study?

The potential discomforts expected as a result of focus group participation include potential embarrassment related to the discussion of sexual health information or distress if one realizes they are engaging in high-risk behaviors. To minimize discomforts, you will be advised to provide general information that is representative of young adult Black women and not information that is representative only of yourself. You will be asked to think of your friends, family, and colleagues when responding. You will also be provided with a list of Los Angeles County STD clinics, upon request.

Are there any potential benefits if I participate?

You will not directly benefit from your participation in the study.

The results of the research will help the researcher to adapt a face-to-face sexual health intervention to an intervention that can be delivered on a mobile phone.

Will I be paid for participating?

You will receive lunch at the beginning of the focus group session. You will also receive a \$50 gift card at the completion of the focus group session.

Will information about me and my participation be kept confidential?

Up to eight participants will be invited to participate in the focus group. It may be possible to link demographic information with individual participants. All participants will be asked to keep what is said during the group discussion between the participants only. However, complete confidentiality cannot be guaranteed. Any information that is obtained in connection with the focus group and that identifies you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be increased by: 1) removing all personal identifiable information from the focus group transcripts, 2) keeping the focus group recording on password protected digital recorders, and 3) destroying the recordings once the study is complete. A hired transcriptionist will transcribe the focus group recording. The transcripts will be used to document the accuracy of workgroup findings.

What are my rights if I take part in this study?

- You can choose whether or not you want to be in this study, and you may withdraw your consent and discontinue participation at any time.
- Whatever decision you make, there will be no penalty to you, and no loss of benefits to which you were otherwise entitled.
- You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can I contact if I have questions about this study?

• **The research team:**

If you have any questions, comments or concerns about the research, you can talk to the one of the researchers. Please contact:

Tiffany M. Montgomery, MSN, RNC-OB, C-EFM
Tiffany.Montgomery@ucla.edu
(562) 745-5033

Dr. Deborah Koniak-Griffin, RNC, EdD, FAAN
dkoniak@sonnet.ucla.edu
(310) 206-3842

• **UCLA Office of the Human Research Protection Program (OHRPP):**

If you have questions about your rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call the OHRPP at (310) 825-7122 or write to:

UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694

VERBAL CONSENT:

By stating, "agree," you are indicating that:

1. You understand the information that has just been read to you
2. You voluntarily agree to participate in the focus group

If you do not wish to participate in the focus group, please decline participation by stating, "disagree."

INSTRUCTIONS FOR THE PI:

If the potential participant agrees, take down their email address for future correspondence.

If the potential participant disagrees, thank them for their time.

Appendix D

RAB Meeting # 1 Topic Guide

Workgroup Topic Guide

Pass out name cards and ask participants to write their first name in large letters. Encourage participants to be eating lunch.

Introduction (adapted from *Hands-on Social Marketing*, p. 299)

Welcome and thank you for coming to our session today. My name is Tiffany Montgomery, and I am a 4th year PhD student in the UCLA School of Nursing. Assisting me are Stephanie Darden and DeJon Harris, two other students in the UCLA School of Nursing.

I am doing a research project on promoting the sexual health of Black young adult women. We often do focus group discussions to help plan health campaigns and programs. I have invited you to this workgroup to find out how young women would like to receive information about keeping themselves healthy. There are no right or wrong answers, just differing points of view. Keep in mind that I am just as interested in negative comments as in positive comments; sometimes the negative comments are the most helpful. You will not be asked to share personal information about your own health behavior. Still, I will make every attempt to keep everything you tell me confidential. It is also important that each of you keep our discussion confidential. This means you should not discuss anything you hear today outside of this room.

Before we begin, let me explain the ground rules. We are recording the discussion because I do not want to miss any of your comments. We will be on a first-name basis today and in my dissertation, there will not be any names attached to comments. I want this to be a group discussion, so you do not need to wait for me to call on you. But please speak one at a time so that the audio recorders can pick up everything.

Our discussion will last no longer than two hours. Following the end of our discussion, you will receive your gift card.

First of all, let's just go around the room and introduce ourselves. Please give us your first name and tell us something interesting about yourself? I will start...

<Continue with script following introductions>

Now that we all know a little bit about each other, I want to get right to work. Let's talk about automated text messages. These are texts that are sent from an organization to a large number of people. For instance, Jamba Juice sends text messages informing customers of discounts and coupons. Have you ever received automated text messages?

What do you like about receiving the message?

What don't you like?

The purpose of my research study is to take a face-to-face women's health intervention and transform it to a text messaging intervention. I've found that a lot of women don't go to the

doctor until they are sick. I want to be able to get sexual health information to them before they find themselves needing treatment for sexually transmitted diseases. A nurse created the intervention I'd like to use. In fact, she created it specifically for Black women. It's called Sister to Sister. Before we talk more about developing text messages, I would like you to see how the intervention is implemented in a clinic setting.

Nurse Practitioner Cheryl and Stephanie will now role play so that you can see the intervention.

<Continue with script following theater testing>

Now, I'd like us to discuss the intervention and possible ways to adapt it into a text messaging program.

Workgroup Questions

1. What was the most important thing you learned from the intervention?

Prompts:

- What was your favorite part of the intervention?
- What was most memorable about the intervention?

2. What aspects of the intervention lends to text messaging?

Prompts:

- What about this intervention makes it the right type of program to be adapted into a text message intervention?
- What about this intervention makes it a challenging program to be adapted into a text messaging intervention?

3. During the demonstration of the intervention, Nurse Practitioner Cheryl read from the curriculum booklet. What do you think about the way she communicated with Stephanie? How would you feel if she were saying those things to you in text messages?

Prompts:

- Was any of the content embarrassing?
- Was there anything she said that would make you feel uncomfortable if you were reading it?

4. If we were to adapt the Sister to Sister intervention into a text message intervention, how often should the intervention messages be sent?

Prompts:

- Should messages be sent more than once per day?
- How many messages should be sent each day?
- How long should we wait before sending the next message?

5. How long should the intervention last?

Prompts:

- How much time do you think it would take to text the entire intervention?
- After how many weeks would the messages lose their appeal?

6. How can the videos be incorporated into the intervention?

Prompts:

- Should the videos be cut down into smaller segment? If so, where should each segment begin and end?

7. How can skill-building exercises be incorporated into the intervention?

Prompts:

- How would you feel about receiving text messages with videos showing proper condom application?

8. Is there anything else that you would like to say that hasn't come up yet?

Thank you for your time!

<Give gift cards>

Focus Group Topic Guide

Focus Group Topic Guide

Pass out name cards and ask participants to write their first name in large letters. Encourage participants to begin eating lunch.

Introduction (adapted from *Hands-on Social Marketing*, p. 299)

Welcome and thank you for coming to our focus group today. My name is Tiffany Montgomery, and I am a PhD candidate in the UCLA School of Nursing. Assisting me are Stephanie Darden and DeJon Harris, two other students from the UCLA School of Nursing.

Focus group discussions are very helpful when planning health campaigns and programs. I have invited you to participate in this focus group to find out what you think about a new sexual health text message program for Black young adult women.

Before we begin, let me explain the ground rules. There are no right or wrong answers, just differing points of view. Keep in mind that I am just as interested in negative comments as in positive comments; sometimes the negative comments are the most helpful.

You will not be asked to share personal information about your own health behavior. Still, I will make every attempt to keep everything you tell me confidential. It is also important that each of you keep our discussion confidential. This means you should not discuss anything you hear today outside of this room.

We are recording the discussion because I do not want to miss any of your comments. We will be on a first-name basis today and in my dissertation, there will not be any names attached to comments. I want this to be a group discussion, so you do not need to wait for me to call on you. But please speak one at a time so that the audio recorders can pick up everything.

Our discussion will last no longer than three hours. Following the end of our discussion, you will receive your gift card.

First of all, let's just go around the room and introduce ourselves. Please give us your first name and tell us something interesting about yourself? I will start...

<Continue with script following introductions>

Now that we all know a little bit about each other, I want to get right to work.

The purpose of my research study is to take a face-to-face women's health intervention and transform it to a text messaging intervention. I've found that a lot of women don't go to the doctor until they are sick. I want to be able to get sexual health information to them before they find themselves needing treatment for sexually transmitted diseases. A nurse created the intervention I'd like to use. In fact, she created it specifically for Black women. It's called Sister to Sister. Before we talk more about the text messages, I would like you to see how the intervention is implemented in a clinic setting. Nurse Practitioner Cheryl and Stephanie will now role-play so that you can see the intervention.

<Continue with script following theater testing>

Questions

1. What was the most important thing you learned from the intervention?
Prompts:

- What was your favorite part of the intervention?
- What was most memorable about the intervention?

Now, I'd like to show you the text message program that was adapted from the face-to-face intervention. The messages will be displayed as PowerPoint slides. You will see when the messages will be sent and what text or multimedia the messages will entail.

<Continue with script following the PPT of the messages>

Questions

2. What are your thoughts of the text message intervention?

Prompts:

- What was the best part of the text message intervention? The worst part?
- Is this an intervention you would want to receive? Why or why not?
- What do you think your 18-24 year old, Black, female friends/family/colleagues would think of the text message intervention?

3. Are all of the previously mentioned important aspects of the original intervention present in the new text message intervention? If not, what's missing?

- How can we incorporate any missing aspects of the original intervention into the new intervention?

4. The text messages will be sent three times per week for a total of 7 weeks. What are your thoughts on the number of messaging being sent? What are your thoughts on the length of the intervention?

Prompts:

- Are the messages too frequent? Too infrequent?
- Are there too many messages? Not enough?
- Is the intervention too long? Too short?

5. Is there anything else you would like to say about the text message intervention?

Thank you for your time!

<Give gift cards>

Appendix E

Phase One Socio-demographic Survey

1. What is your age?

2. What is the highest level of school you have completed or the highest degree you have received?

- High school degree or equivalent (e.g., GED)
- Some college but no degree
- Associate degree
- Bachelor degree
- Graduate degree

3. Which of the following categories best describes your employment status?

- Employed, working 40 or more hours per week
- Employed, working 1-39 hours per week
- Not employed, looking for work
- Not employed, NOT looking for work
- Disabled, not able to work

4. Have you ever been pregnant?

- Yes
- No

5. Have many times have you been pregnant?

6. Have you ever been diagnosed with an STD?

- No
 Yes

7. Which STD(s) have you been diagnosed with?

- Chlamydia
 Gonorrhea
 Syphilis
 HIV
 Other (i.e. HPV, Trichomoniasis, Herpes, etc.)

8. Are you sexually active?

- No
 Yes

9. When was the last time you engaged in sexual intercourse?

- I have had sexual intercourse in the past week
 I have had sexual intercourse in the past three months
 I have had sexual intercourse in the past year

Appendix F

Modified QQ-10 Instrument

Modified QQ-10	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The questionnaire helped me to communicate about my thoughts on sexual relationships.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The questionnaire was relevant to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The questionnaire was easy to complete.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The questionnaire included all the aspects of sexual relationships that I am concerned about.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I enjoyed filling in the questionnaire.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would be happy to complete the questionnaire again in a future study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The questionnaire was too long.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The questionnaire was too embarrassing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The questionnaire was too complicated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The questionnaire upset me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

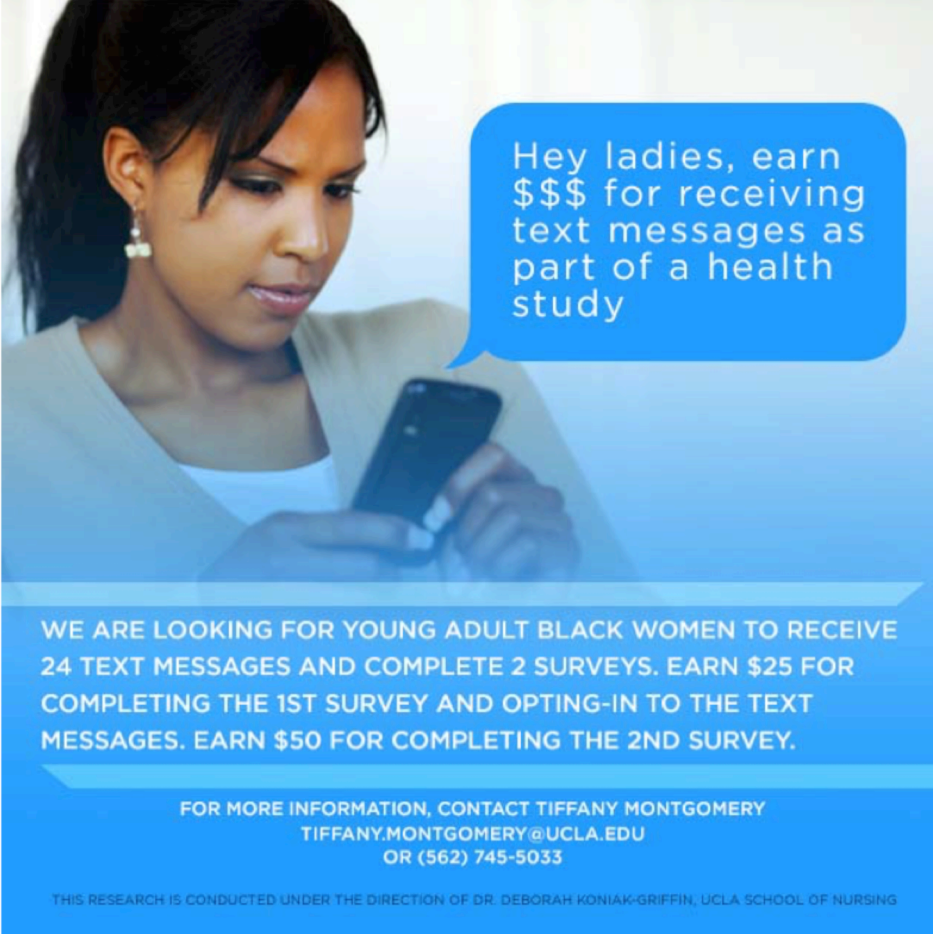
Do you have any comments or suggestions on how the questionnaire you used could be improved (e.g. its structure, appearance or design)?

Were any of your important thoughts, problems or concerns missed out by the questionnaire you used?

Do you feel that any areas or problems in the questionnaire you used were over-represented?

Appendix G

Phase Two Recruitment Flyer



Hey ladies, earn \$\$\$ for receiving text messages as part of a health study

WE ARE LOOKING FOR YOUNG ADULT BLACK WOMEN TO RECEIVE 24 TEXT MESSAGES AND COMPLETE 2 SURVEYS. EARN \$25 FOR COMPLETING THE 1ST SURVEY AND OPTING-IN TO THE TEXT MESSAGES. EARN \$50 FOR COMPLETING THE 2ND SURVEY.

FOR MORE INFORMATION, CONTACT TIFFANY MONTGOMERY
TIFFANY.MONTGOMERY@UCLA.EDU
OR (562) 745-5033

THIS RESEARCH IS CONDUCTED UNDER THE DIRECTION OF DR. DEBORAH KONIAK-GRIFFIN, UCLA SCHOOL OF NURSING

Appendix H

Phase Two Screening Script

UNIVERSITY OF CALIFORNIA, LOS ANGELES SCREENING CONSENT SCRIPT

S2S Young Women's Health Study
Phase Two

Answers in red are the answers that would make the potential participant eligible for the study

Thank you for calling regarding the S2S Young Women's Health Study. My name is Tiffany Montgomery and I am the principal investigator for this study. I would like to ask you a few questions in order to determine whether you may be eligible to participate in the study. Before I begin the screening I would like to tell you a little bit about the research.

This research study will examine the use of text messages as a form of health education. If you are eligible to participate in the study, you will be asked to complete two surveys and you will receive several text messages over a period of eight weeks.

Would you like to continue with the screening? *[If no, thank the person and hang-up]*

The screening will take less than 5 minutes. I will ask you about your age, gender, ethnicity, relationship status, and sexual history. You do not have to answer any questions you do not wish to answer or are uncomfortable answering, and you may stop at any time. Your participation in the screening is voluntary.

Your answers will be confidential. No one will know your answers except me. I am not writing your answers to the screening questions. If you are eligible for the study, and you provide your verbal consent to participate, you will receive further information via email. The only information you give me that will be kept is your email address. If you are not eligible for the study, you will not be asked for your email address.

Would you like to continue with the screening? *[If no, thank the person and hang-up]*

1. What is your ethnicity?

Black/African-American

2. What is your gender?

Female/girl/women

3. How old are you?

18 - 24

4. Do you own a mobile phone with text messaging capabilities?

Yes

5. Do you share your mobile phone with another person?

No

6. Do you have an email address?

Yes

7. Do you share your email address with another person?

No

8. Are you married?

No

9. Are you planning to become pregnant in the next 6 months?

No

10. Have you had vaginal, anal, or oral sex with a man in the past 3 months?

Yes

Thank you for answering the screening questions.

If eligible: You are eligible to participate in this study because you are a single, young adult Black woman, age 18-24, who is sexually active, and who owns a cellular phone with text messaging capabilities.

Do you have any questions about the screening or the research? I am going to give you a couple of telephone numbers to call if you have any questions later. Do you have a pen? If you have questions about the research screening, you may call me and I will answer your questions. My number is (562) 745-5033.

If you have questions about your rights as a research subject or if you wish to voice any problems or concerns you may have about the study to someone other than the researchers, please call the UCLA Office of the Human Research Protection Program at (310) 825-7122.

Thank you again for your willingness to answer my questions. I will email the consent form to you now. Please read it over and feel free to call or email me with any questions before you sign and submit the form. Do you have any other questions for me? **[Answer questions, if any]**

STOP HERE

If not eligible: You are not eligible to participate in this study because _____.

Thank you again for your willingness to answer my questions.

Appendix I

Phase Two Consent Form

University of California, Los Angeles

CONSENT TO PARTICIPATE IN RESEARCH

Women's Health Study (Phase Two)

Tiffany M. Montgomery, MSN, RNC-OB, C-EFM and Deborah Koniak-Griffin, RNC, EdD, FAAN, from the School of Nursing at the University of California, Los Angeles (UCLA) are recruiting young women to participate in a new research study.

You were selected as a potential study participant because you are a single, young adult Black woman, age 18-24, who is sexually active, and who owns a mobile phone with text messaging capabilities. Your participation in this study is voluntary.

Why is this study being done?

This research study will examine young adult Black women's feelings about the use of text messages as a form of health education and evaluate how these messages influence their health behaviors.

How many people will take part in this study?

50 women will be asked to participate nationwide.

What will happen if I take part in this research study?

Baseline Survey: You will be asked to complete an online survey, which includes six demographic items and 76 healthy behavior items. Examples of the demographic items include: "what is your age," "what is the highest level of school you have completed or the highest degree you have received," and "how many times have you ever been pregnant?" Examples of the healthy behavior items include: "I feel confident in my ability to put a condom on my partner," "how often do you buy fresh vegetables or frozen vegetables," and "how many days per week do you do moderate activities for at least 10 minutes?" The baseline survey should take no more than 15 minutes to complete.

Randomization: You will be randomized to one of two groups. Randomization is a procedure used to assign research participants by chance to a study group in a clinical trial. It is used to make sure study results are not influenced by the selection of participants in one group as compared to another. In this study, you have a 50% chance of being assigned to one group or another.

Text Messages: You will receive three text messages per week, over the course of eight weeks. The text message may contain text-only, pictures, or videos. CAUTION: Please do not check or send text messages while driving.

- If you are in Group 1: You will receive diet and exercise text messages. Here is an example of the type of text message you may receive: "Start off with a good breakfast, like boiled eggs, turkey bacon, and a bowl of fruit, to jumpstart your day."
- If you are in Group 2: You will receive sexual health text messages. Here is an example of the type of text message you may receive: "18-24 y.o. Black women have the highest

rates of Chlamydia, Gonorrhea, Syphilis, & HIV among women. Respect yourself, protect yourself, because you're worth it!"

Follow-Up Survey: You will be asked to complete an online survey, which includes 20 items that measure whether or not you liked the text messages, and the healthy behavior items that were completed in the baseline survey. The follow-up survey should take no more than 20 minutes to complete.

How long will I be in this study?

Participation will take no longer than 10 weeks, from the time you opt-in to the text messages to the time you complete the follow-up survey.

What kinds of risks or discomforts can I expect?

You will be assigned to a study group at random (by chance). Your assignment is based on chance (like a coin flip) rather than a decision made by the researchers. The study group you are assigned to might not be the group you would prefer to be in.

You may also experience potential embarrassment related to the receipt of sexual health information or distress if you believe you are engaging in high-risk behaviors. You will be provided with a link to local STD clinics.

Some of the survey items may be upsetting, or you may feel uncomfortable answering them. If you do not wish to answer a question, you can skip it and go to the next question.

As this study involves the use of your identifiable, personal information, there is a chance that a loss of confidentiality will occur. The researchers have procedures in place to lessen the possibility of this happening (see "How will my information be kept confidential?" section below).

Are there any potential benefits if I participate?

Taking part in this study may or may not improve your health. While the researchers hope the text messages will be more effective than standard (usual) health education, there is no proof of this yet.

Participants of Group 1 may benefit from increased awareness of proper diet and exercise recommendations; increased desire to eat healthy and exercise; and decreased weight, if changes to diet and exercise are made.

Participants of Group 2 may benefit increased ability to protect themselves from high-risk sexual behaviors by using condoms; increased self-efficacy to use condoms appropriately; increased self-efficacy to negotiate condom use; increased awareness of high rates of STDs among young adult Black women; and decreased high-risk sexual behaviors.

What other choices do I have if I don't want to participate?

The only alternative is not to participate in this study.

Can the researchers remove me from this study?

The researchers may end your participation in this study for a number of reasons, such as if you do not follow instructions. The researchers might also decide to stop the study at any time. You may also end your participation in the study by opting out of the text messages.

If you decide to stop being in the study, or are removed from the study, or the study is stopped, the data collected about you up to that point will remain part of the study and may not be removed from the study database.

How will information about me and my participation be kept confidential?

The researchers will do their best to make sure that your private information is kept confidential. Information about you will be handled as confidentially as possible, but participating in research may involve a loss of privacy and the potential for a breach in confidentiality. Study data will be physically and electronically secured. As with any use of electronic means to store data, there is a risk of breach of data security.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law.

All identifiable information about you will be replaced with a code. A list linking the code and your identifiable information will be kept separate from the research data.

All research data and records will be stored electronically on a secure computer with password protection. Some research data will also be stored electronically on a secure network with encryption and password protection (i.e. Survey Monkey).

The research team and authorized UCLA personnel may have access to study data and records to monitor the study. Research records provided to authorized, non-UCLA personnel will not contain identifiable information about you. Publications and/or presentations that result from this study will not identify you by name.

In the future, data collected for this study may be shared with other researchers for other studies that are unknown at this time. Any data shared with other researchers, will not include your name or other personal identifying information.

Just as your participation in the study will be confidential, you must keep all text messages confidential. This means you may not forward any text messages, place any study-related messages on any social media accounts (including Facebook, Twitter, or Instagram), or tell anyone about the messages you receive. This is very important, as everyone in the study may not receive all of the same messages.

Are there any costs for taking part in this study?

If you do not have an unlimited texting plan with your cell phone provider, you may incur costs for the text messages that you will receive. The researchers will not reimburse these, or any additional, costs that you may incur while participating in this study.

Will I be paid for my participation?

You may receive up to \$75 for your participation. You will receive a \$25 Target gift card after you submit the baseline survey and opt-in to the text messages. Then, following the receipt of all text messages, you will receive a \$50 Target gift card upon submission of the follow-up survey. Gift cards will be sent to you via email, within 72 hours of text message enrollment and follow-up survey completion.

Who can I contact if I have questions about this study?

- **The Research Team:**
You may contact Tiffany Montgomery at Tiffany.Montgomery@ucla.edu or (562) 745-5033 with any questions or concerns about the research or your participation in this study.
- **UCLA Office of the Human Research Protection Program (OHRPP):**
If you have questions about your rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call the OHRPP at (310) 825-7122 or write to:

UCLA Office of the Human Research Protection Program
11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694

What are my rights if I take part in this study?

- You can choose whether or not you want to be in this study, and you may withdraw your consent and discontinue participation at any time.
- Whatever decision you make, there will be no penalty to you, and no loss of benefits to which you were otherwise entitled.
- You may refuse to answer any survey questions that you do not want to answer and still remain in the study.

How do I indicate my agreement to participate?

If you agree to participate in this study you should type your email address, cell phone number, and the date below. You may print a copy of this consent form and the Research Participant’s Bill of Rights (next page) to keep.

ELECTRONIC SIGNATURE OF THE PARTICIPANT

_____	_____
Name	Mobile Phone Number
_____	_____
Email Address	Date

By clicking the button below, you agree to participate in this study:

SUBMIT

Appendix J

Acceptability/Feasibility Instrument

Acceptability Survey					
Please select the best answer.					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I enjoyed receiving the text messages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The text messages contained information that was helpful to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The text messages were too frequent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I really liked the memes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would share these types of text messages with my friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I was able to read the text messages as soon as I received them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Receiving the text messages was an inconvenience for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The text messages should have been sent for a shorter period of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I found it difficult to receive the text messages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I looked forward to receiving the text messages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I liked the times of day that the text messages were sent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I was unable to view the memes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I wish there were more text messages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. The text messages should have been sent for a longer period of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strongly Agree Agree Neutral Disagree Strongly Disagree

15. I know women who would benefit from receiving these types of text messages.

What other thoughts do you have related to the text messages?

How can the text message program be improved?

Answer the following questions ONLY if video links were included in your text messages:

Strongly Agree Agree Neutral Disagree Strongly Disagree

16. I really liked the videos.

17. I was unable to view the videos.

To the best of your memory, of the seven videos sent, how many videos did you view?

Appendix K

Baseline Sexual Behavior Questions

CDC Sexual Behavior Questions				
· Main sex partner – a partner who you feel committed to above anyone else				
· Casual sex partner – a partner who is not your main partner or whom you did not consider to be your main partner at the time				
Select the answers that apply to you and your partner(s):				
	Main Partner Yes	Main Partner No	Casual Partner Yes	Casual Partner No
1. In the past 3 months have you had vaginal sex where your partner's penis entered your vagina?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Was a condom used every time you had vaginal sex in the past 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was a condom used some of the times you had vaginal sex in the past 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The last time you had vaginal sex, where your partner's penis entered your vagina, was a condom used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. In the past 3 months have you had anal sex, where your partner's penis entered your anus (butt)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was a condom used every time you had anal sex in the past 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Was a condom used some of the times you had anal sex in the past 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The last time you had anal sex, where your partner's penis entered your anus (butt), did you use a condom?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Main Partner Yes	Main Partner No	Casual Partner Yes	Casual Partner No
9. In the past 3 months have you had oral sex where your partner's penis entered your mouth?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Was a condom used every time you had oral sex in the past 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Was a condom used some of the times you had oral sex in the past 3 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The last time you had oral sex, where your partner's penis entered your mouth, was a condom used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix L

Condom Use Self Efficacy Scale Mechanics Subscale

Condom Use Self-Efficacy Scale: Mechanics Subscale					
Please select the best answer					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I feel confident in my ability to put a condom on my partner.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I feel confident that I could use a condom successfully.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I feel confident I could gracefully remove and dispose of a condom when we have intercourse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I feel confident in my ability to put a condom on my partner quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix M

Condom Use Self Efficacy Scale Assertiveness Subscale

Condom Use Self-Efficacy Scale: Assertive Subscale					
Please select the best answer					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I feel confident in my ability to discuss condom usage with any partner I might have.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I feel confident in my ability to suggest using condoms with a new partner.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I feel confident I could suggest using a condom without my partner feeling "diseased".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix N

Sexual Risk Scale Intention to Try Subscale

Sexual Risk Scale: Intention Subscale					
Please select the best answer.					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. If I were going to have sex, I would take precautions to reduce my risk of STDs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. "Safer" sex is a habit for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I intend to follow "safer sex" guidelines within the next year.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. If I were going to have sex in the next year, I would use condoms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would avoid using condoms if at all possible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I am determined to practice "safer" sex.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I would try to use a condom when I had sex.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix O

Sexual Relationship Power Scale Relationship Control Subscale

Sexual Relationship Power Scale: Relationship Control Subscale				
Please select the best answer.				
	Strongly Agree	Agree	Disagree	Strongly Disagree
1. If I asked my partner to use a condom, he would get violent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If I asked my partner to use a condom, he would get angry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Most of the time, we do what my partner wants to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My partner won't let me wear certain things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. When my partner and I are together, I'm pretty quiet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. My partner has more say than I do about important decisions that affect us.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. My partner tells me who I can spend time with.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. If I asked my partner to use a condom, he would think I'm having sex with other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I feel trapped or stuck in our relationship.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. My partner does what he wants, even if I do not want him to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I am more committed to our relationship than my partner is.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. When my partner and I disagree, he gets his way most of the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. My partner gets more out of our relationship than I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Agree	Agree	Disagree	Strongly Disagree
14. My partner always wants to know where I am.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. My partner might be having sex with someone else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix P

Phase Two Baseline Socio-Demographic Items

Baseline Demographic Survey

1. What is your age?

2. What is the highest level of school you have completed or the highest degree you have received?

High school degree of equivalent (e.g., GED)

Some college, but no degree

Associate Degree

Bachelor Degree

Graduate Degree

3. Which of the following categories best describes your employment status?

Employed, working 40 or more hours per week

Employed, working 1-39 hours per week

Not employed, looking for work

Not employed, NOT looking for work

Disabled, not able to work

4. How many times have you ever been pregnant?

5. Which of the following STDs have you ever been diagnosed with?

Chlamydia

Gonorrhea

Syphilis

HIV

Other (i.e. HPV, Trichomoniasis, Herpes, etc.)

I have never been diagnosed with an STD

6. Are you sexually active?

- No
- Yes, I have had sexual intercourse in the past week
- Yes, I have had sexual intercourse in the past three months
- Yes, I have had sexual intercourse in the past year

Phase Two Follow-Up Socio-Demographic Items

Follow-Up Demographic Survey

1. While participating in this study, were you pregnant?

- Yes
 No

2. While participating in this study, did you have any of the following issues with your mobile phone that prevented you from receiving text messages? Select all that apply.

- My mobile phone was not in service for a period of time during the study
 I had to have my mobile phone replaced during the study
 I changed mobile phone numbers during the study
 I did not have any issues with my phone during the study
 Other (please specify)

3. How did you first hear about this study?

- Craig's List
 Email
 Facebook Advertisement
 Facebook Post by one of my Facebook friends
 Instagram Post
 Someone I know told me about it (i.e. word of mouth)
 Twitter Post
 Other (please specify)

Appendix Q

Lifestyle Behavior Questionnaire

Lifestyle Behavior Questionnaire				
How often do you do the following:				
	Never	Sometimes	Usually	Always
1. Buy fresh vegetables or frozen vegetables.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Buy garlic or garlic powder instead of garlic salt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Choose foods labeled low sodium, sodium free, or no salt added.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Eat fruit without salt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Add little or no salt to the water when cooking beans, rice, pasta and vegetables.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Get smoked, cured, and processed beef, pork, and poultry like bologna, ham and sausage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Use a saltshaker at the table.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Fill the saltshaker with a mixture of herbs and spices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Choose fruits and vegetables instead of salty snacks like chips, fries, and pork rinds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Drink 1% or skim milk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Eat fat free or low fat cheese	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Use non-stick cooking oil spray to grease baking pans and skillets instead of using fat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	Sometimes	Usually	Always
13. Read the food label to help you choose foods lower in fat, saturated fat, and cholesterol.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Cut the fat from beef and skin from chicken/turkey before cooking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Cook ground meat and drain the fat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Cool soups and remove the layer of fat that rises on the top	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Choose fat free or low fat salad dressings, mayonnaise, and sour cream.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Use small amounts of margarine instead of butter.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Choose fruits and vegetables instead of high fat foods like cookies or fries.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Read labels to choose foods lower in calories, fat, cholesterol, or sugar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Bake fish or other foods instead of frying it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Add servings of vegetables to a meal instead of more meat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Eat smaller portions of food and do not go back for seconds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Drink water instead of sodas or sugared drinks like Kool Aid.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Skip breakfast, lunch, or dinner on purpose.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Eat more when feeling stressed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	Sometimes	Usually	Always
27. Eat fruits instead of desserts or snacks that have sugar in them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Lifestyle Behavior Questionnaire (Part II)

1. When you are at work, which of the following best describes what you do? Would you say?

- Mostly sitting or standing
- Mostly walking
- Mostly heavy labor or physically demanding work

Instructions: "We are interested in two types of physical activity – vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate while moderate activities cause small increases in breathing or heart rate."

2. Now, thinking about the moderate activities you do in a usual week, do you do moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate?

- Yes
- No (If "No," please skip to Question 5)

3. How many days per week do you do these moderate activities for at least 10 minutes?

Days per week

4. On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities? (Example: 1 hour and a half = 1 hour per day, 30 minutes per day OR 90 minutes per day.)

Hours per day

Minutes per day

5. Now, thinking about the vigorous activities you do in a usual week, do you do vigorous activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?

- Yes
- No (If, "No," please skip to Question 8)

6. How many days per week do you do these vigorous activities for at least 10 minutes at a time?

Days per week

7. On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities? (Example: 1 hour and a half = 1 hour per day, 30 minutes per day OR 90 minutes per day.)

Hours per day

Minutes per day

8. Now think about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. During the last 7 days, how much time did you usually spend sitting on a week day?

Hours per day

Minutes per day

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