SEXUAL RISK BEHAVIORS AMONG AFRICAN AMERICAN YOUNG WOMEN IN NEW ORLEANS

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I. ABSTRACT

Emerging adults are at higher risk of intimate partner violence (IPV) than any other age group and women of color experience IPV at higher rates than white women. African American female adolescents who have experienced IPV are more likely to exhibit unhealthy sexual behaviors than their peers who have not experienced IPV, such as inconsistent condom use. Most unintended pregnancies among adolescents occur when contraception is used inconsistently. There is a small but growing body of literature on the health of African American college students. Students attending HBCUs engage in less risky behaviors than white college students yet experience a heavier burden of sexual consequences. Study participants were surveyed as part of an online pregnancy prevention intervention evaluation. All participants were African American females ages 18–19 living in the New Orleans area. The Theory of Gender and Power was used to examine exposures and risk factors of sexual risk behaviors. The prevalence of psychological aggression victimization was 52% at baseline. There were significant relationships between psychological aggression and being in a steady relationship or experiencing depression. The prevalence of consistent contraception use was 54% and of consistent condom use was 58%. There was a significant relationship between inconsistent condom use and psychological aggression victimization occurring two or more times. There was no significant relationship between consistent contraception use and psychological aggression; there were significant relationships for sometimes using alcohol or drugs before sexual activity and depression. The prevalence of consistent contraception use among HBCU students was 62%. There

was a significant relationship between consistent contraception use and the education level of female students' mothers. Healthy relationship-skill building is essential for young men and women. Additionally, first-generation college students at HBCUs need sexual health programming. Comprehensive interventions and wrap-around services are needed to improve the sexual health of late adolescents.

II. INTRODUCTION

BACKGROUND

"Navigating sexuality is an important component of development during adolescence that continues into young adulthood" (Stinson, 2010, p. 104). Adolescent sexual health is a critical, yet often neglected, issue in Louisiana. Louisiana youth rank among the highest in the nation for teen births and sexually transmitted infections (SIECUS, n.d.). Louisiana had the 7th highest teen birth rate in the country in 2017 (Louisiana Department of Health [LDH], 2019). Orleans Parish had the fifth highest number of teen births of the 64 parishes (counties) in Louisiana (LDH, 2019). See **Table 1** for adolescent birth rates. In 2017, 75% of teen births in Louisiana were to young women ages 18 or 19 (Power to Decide, 2020).

Table 1. Adolescent Birth Rates, 2017
(LDH, 2019; Power to Decide, 2020)

	Birth rate per 1,000 adolescent young women ages 15 to 19
United States (all races)	22.3
Louisiana (all races)	34.1
Louisiana (African American adolescents)	36.0
*Orleans Parish (all races)**	20.2

*Data are not available by race at the parish level.

The vast majority of teen births are unintended in the United States (Logan et al., 2007; Manlove et al., 2004). In 2010, 60% of all births in Louisiana were unintended and the federal and state governments spent $651.0 million on unintended pregnancies in the state (Guttmacher Institute, 2016; Sonfield & Kost, 2015). In Louisiana, 67% of all births in 2010 were paid for by public insurance through Medicaid, the Children's Health Insurance Program and the Indian Health

Service (Sonfield & Kost, 2015). Public insurance programs paid for 79% of the 33,700 unplanned births in Louisiana that year, compared with 53% of planned births (Sonfield & Kost, 2015). A publicly funded birth in Louisiana in 2010 cost an average of $16,779 in prenatal care, labor and delivery, postpartum care and 12 months of infant care; when 60 months of care are included, the cost per birth increases to $24,180 (Sonfield & Kost, 2015). To put these figures in perspective, in 2010, the federal and state governments together spent an average of $700 on unintended pregnancies for every woman aged 15–44 in Louisiana (Sonfield & Kost, 2015). Only Alaska spent more per capita on unintended pregnancies than Louisiana in 2010 and "expenditures varied by state for a number of reasons, including variations in medical costs, the proportions of women who are poor and on Medicaid, the proportions of all births that are unplanned and the overall fertility rate of women in the state" (Sonfield & Kost, 2015, p. 8).

In addition to high rates of births to adolescent mothers, Louisiana had the highest rate of reported cases of chlamydia and the second highest rate of reported cases of gonorrhea among young women ages 15–24 in the United States in 2017 (Centers for Disease Control and Prevention [CDC], 2018a). The same year, Orleans Parish had the highest number of reported cases of chlamydia, gonorrhea and primary and secondary syphilis among people of all ages in Louisiana (LDH, 2019). See **Table 2** for sexually transmitted disease rates. In 2017, young people ages 13 to 24 made up 21% of new HIV diagnoses in the United States (CDC, 2019). Orleans Parish had the highest number of newly diagnosed cases of HIV among people of all ages in Louisiana in 2017 (LDH, 2019). See **Table 3** for HIV rates.

Table 2. Sexually Transmitted Disease Case Rates, 2017
(CDC, 2018a; LDH, 2019)

	Primary and Secondary Syphilis Rate per 100,000	*Chlamydia Rate per 100,000*	*Gonorrhea Rate per 100,000*
United States (women ages 15–24)	6	2,072	623
Louisiana (women ages 15–24)	N/A	5,746	1,304
Louisiana (all ages and genders)	14	742	256

Table 3. HIV Diagnosis Rates, 2017
(CDC, 2018b; LDH, 2019)

	HIV Rate per 100,000
United States (ages 15–19)	8.1
United States (all ages)	11.8
Louisiana (all ages)	22.1

In 2015, the Louisiana Public Health Institute conducted in-depth interviews with young people ages 14 to 24 in New Orleans to learn about their perceptions and experiences relating to sexual and reproductive health. Many of the young people identified sexual violence and abuse—including rape, sexual assault, and dating/intimate partner violence (IPV)—as a serious health issue faced by themselves and their peers (Louisiana Public Health Institute, 2016). According to the 2013 Youth Risk Behavior Survey, Louisiana high school students experience physical IPV—including being hit, slammed into something, or injured with an object or weapon on purpose by someone they were dating—at a significantly higher rate (15%) than their peers nationwide (10%) (CDC, n.d.). According to the 2010 National Intimate Partner and Sexual Violence Survey, 33% of women and 28% of men in Louisiana have experienced IPV in their lifetimes (Black et al., 2011).

Among a rural sample of adolescents, psychological aggression victimization predicted increased alcohol and marijuana use and increased symptoms of depression and anxiety among young women (Foshee et al., 2013). Adolescents who have experienced physical or sexual IPV are more likely to exhibit a wide variety of unhealthy sexual behaviors, attitudes, beliefs, and norms than their peers who have not experienced IPV (Silverman et al., 2011; Wingood et al., 2001). These include having multiple sexual partners, using condoms inconsistently, fear of negotiating condom use, fear of talking with their partner about pregnancy prevention, having a higher perceived risk of acquiring a sexually transmitted infection (STI), perceiving less control over their sexuality, having peer norms that are not supportive of using condoms, and having norms that are not supportive of having a healthy relationship (Silverman et al., 2011; Wingood et al., 2001). Adolescents and young adults with a history of physical and sexual IPV were also more likely to have a sexually transmitted infection than those who had not experienced IPV (Hess et al., 2012; Wingood et al., 2001).

Half of unintended pregnancies occur among women who use contraception inconsistently or incorrectly (Owusu-Edusei et al., 2013). Births resulting from unintended pregnancies are associated with adverse maternal and child health outcomes, such as delayed prenatal care, premature birth, and negative physical and mental health effects for children (Guttmacher Institute, 2019). Compared to women with planned pregnancies, mothers with unintended pregnancies were more likely to smoke during and after pregnancy and to report postpartum depression; they were less likely to consume recommended amounts of

preconception folic acid, to initiate prenatal care during the first trimester, and to breastfeed for eight or more weeks (D. Cheng et al., 2009). Unintended pregnancy rates are highest among poor and low-income women, women aged 18–24, and women of color (Guttmacher Institute, 2019).

In 2015, there were nearly 20 million students enrolled in institutes of higher education in the United States, 14% of whom were African American (U.S. Department of Education, 2016). Historically black colleges and universities (HBCUs) enroll 25% of college-educated African American young adults (Sutton et al., 2011). HBCUs are a cornerstone of the African American community, but they continue to be underrepresented in research studies and there is limited information about health behaviors among students attending HBCUs (Hayes et al., 2009; Younge et al., 2013). There is a small but growing body of literature on African American college students; however, much of the past research has focused on African American students attending predominately white institutions and, therefore, may not be generalizable to the unique environment of HBCUs (Younge et al., 2013). According to Younge and colleagues (2013), "students attending HBCUs may engage in less risky behaviors than their white counterparts, yet continue to experience a heavier burden of sexual consequences" (p. 255). HBCUs typically have smaller enrollments, resulting in smaller on-campus sexual networks (US Commission on Civil Rights, 2010; Younge et al., 2013). There are also typically more women than men enrolled in HBCUs, and this gender ratio imbalance has an impact on partner choice and behaviors among female students attending HBCUs (Owens Ferguson et al., 2006; Younge et al., 2013). These factors lead to HBCU

students engaging in sexual activity with individuals outside of the institution, potentially introducing "higher-risk" individuals into an otherwise small sexual network (Hightow et al., 2005; Younge et al., 2013). Developing effective prevention efforts for this population is complicated by the lack of studies of sexual risk behaviors among African American college students in general, and those attending HBCUs in particular (Younge et al., 2013).

The current studies focus on African American late adolescent women in the greater New Orleans area and examine factors that might influence sexual risk behavior including the prevalence and correlates of psychological aggression by male intimate partners; the relationship between psychological aggression victimization and consistent contraception and condom use; and the prevalence and correlates of consistent contraception use specifically among students attending historically black colleges and universities. Understanding factors that increase risk for unintended pregnancy and experiencing IPV is essential for developing effective interventions to improve the sexual health of late adolescents. In particular, there is limited information about contraceptive use and health behaviors among students attending HBCUs (Hayes et al., 2009). Data specific to African American late adolescent women in the greater New Orleans area will influence the development of interventions to address Louisiana's high rates of IPV and unintended pregnancy.

SIGNIFICANCE

The developmental stage of young women in late adolescence is a crucial time for sexual health interventions. Becoming a sexually healthy adult is a developmental task of late adolescence and young women are transitioning to adult

roles in relationships, school, and work (Tulloch & Kaufman, 2013). Young adulthood (ages 18–26) has been deemed a unique developmental time period (Lederer & Oswalt, 2017). Individuals within this age range have been called "surprisingly unhealthy," with more health risks and negative outcomes than the adolescents and adults they are sandwiched between (Bonnie et al., 2015; Lederer & Oswalt, 2017). Late adolescence continues through the postsecondary education period, and sexual risk behaviors and intimate partner violence are common among college-age young women (American College Health Association, 2016; Tulloch & Kaufman, 2013). Although society seems to better recognize the need for health-related programs and services among children and younger adolescents, college students are an important priority population, and higher education is an opportune setting for sexual health promotion (Lederer & Oswalt, 2017).

However, little research has been done on the risks specific to students attending community colleges or historically black colleges and universities (HBCUs). Research has shown that students attending HBCUs engage in less risky behaviors than white college students, yet experience a heavier burden of sexual consequences, such as sexually transmitted infections and unintended pregnancy (Buhi et al., 2010; Younge et al., 2013). Of the 137 United States postsecondary institutions in the Spring 2016 National College Health Assessment II undergraduate reference group, only two were HBCUs and 11 were 2-year colleges (American College Health Association, 2016). There is also very little data available on sexual risk behaviors and sexual violence among adolescents in Louisiana, as state law prohibits surveillance of sexual risk behaviors in public secondary schools, where

this data are typically collected (La. Rev. Stat. Ann. § 17.281, 1993). The current studies address these gaps in the literature by analyzing sexual risk behaviors among African American young women in New Orleans.

THEORETICAL FRAMEWORK

The current study will use the Theory of Gender and Power (TGP) as a theoretical framework to guide selection of potential predictors of psychological aggression victimization and inconsistent contraception use. TGP was originally developed by sociologist R.W. Connell (1987) and describes a three part structure of gender relations. Connell built off a growing body of literature from the feminist movement to describe gender relations as social structures rather than biological divisions. Previous theories about gender relied on extrinsic determinants—such as class—and intrinsic determinants of gender inequality—such as biological sex roles, whereas Connell argued for a practice-based theory that takes into account power dynamics and politics. According to Marshall (2008), "practice-based theories present a relational and process-orientated view of…social phenomena" (p. 418). Rather than assuming that the reproductive dichotomy is the absolute basis of gender and sexuality, Connell draws on Kessler and McKenna (1978) to define gender as a "practical accomplishment: something accomplished by social practice" (Connell, 1987, p. 76). Connell further proposes and defines three structures that characterize the gendered relationships between women and men as 1) the sexual division of labor, 2) the sexual division of power, and 3) cathexis, which examines the structure of affective attachments and social norms (Connell, 1987; Wingood & DiClemente, 2002).

Public health applications of the Theory of Gender and Power (TGP) were first described by Wingood and DiClemente (1997) in their seminal article, *The Effects of an Abusive Primary Partner on the Condom Use and Sexual Negotiation Practices of African-American Women*. Wingood and DiClemente (2002) further adapted TGP for public health use and postulated, "that the gender-based inequities and disparities in expectations that arise from each of the three structures (division of labor, division of power, and cathexis) generate different exposures and risk factors that influence women's risk for disease" (p. 313). The sexual division of labor can be thought of as creating economic exposures and socioeconomic risk factors, while the sexual division of power results in physical exposures and behavioral risk factors (Wingood & DiClemente, 2002). The structure of affective attachments and social norms (cathexis) produces social exposures and personal risk factors (Wingood & DiClemente, 2002). The public health adaptation thus expands the original three structures of TGP into six theoretical constructs: physical exposures, behavioral risk factors, social exposures, personal risk factors, economic exposures, and socioeconomic risk factors.

This adaptation has primarily been used for developing HIV interventions for women (Wingood et al., 2009). A suite of three evidence-based interventions were designed by Wingood and DiClemente using TGP to guide intervention content to reduce HIV sexual risk behaviors among African American women (Wingood et al., 2009). The theoretically derived HIV intervention activities were tailored differentially for each target subpopulation on which the intervention focused (Wingood et al., 2009). WiLLOW (Women Involved in Life Learning from Other

Women) was designed as an HIV transmission risk-reduction program for women living with HIV, SiSTA (Sistas Informing Sistas about Topics on AIDS) was developed to reduce the risk of HIV among young adult African American women, and SIHLE (Sistas, Informing, Healing, Living and Empowering) aims to reduce the risk of HIV among sexually active African American adolescent females (Wingood et al., 2009). Wingood and colleagues (2009) explain that in the WiLLOW intervention, "the theory of gender and power emphasized the limited social networks among women living with HIV, how societal expectations of women's role as caregivers constrains their ability to seek new social network members or ask existing network members for support" (p. 410). In the SiSTA and SIHLE HIV interventions, TGP was applied to enhance their relevance for female African American young adults or adolescents (Wingood et al., 2009). For example, Wingood and colleagues (2009) describe that the application of TGP in SIHLE (the intervention on which the original study was based) highlights HIV-related social processes prevalent in the lives of African American female adolescents, such as having older male sex partners, having abusive dating partners, being stereotyped by the media, perceiving society as having a limited regard for African American teens, engaging in serial monogamy, experiencing peer pressure to engage in risky sex, and not communicating assertively about safer sex.

Other applications of TGP include constructs and variables related to intimate partner violence, communication skills, condom use, and other sexual risk behaviors among women. St. Lawrence and colleagues (1997) compared the effectiveness for the reduction in HIV risk among incarcerated women of an

intervention based on social cognitive theory against a comparison condition based on TGP and explain that "participants in the intervention based on social cognitive theory showed greater improvement in condom application skills, and women in the program based on the theory of gender and power evidenced greater commitment to change" (p. 504). The SIHLE curriculum draws upon both TGP and social cognitive theory (DiClemente et al., 2004). Crosby and colleagues (2002) used TGP to guide selection of potentially important psychosocial correlates of adolescents' infrequent sexual communication with their sex partners. TGP theorizes that power differentials favoring men and social norms regarding female sexuality may pose health risks for women. Thus, selected correlates included perceived ability and fear of negotiating condom use, partner-related barriers to condom use, female adolescents' body image, their motivation and attitudes toward condom use, perceived lack of access to condoms, and their perceived family support and level of communication with parents about sexuality (Crosby et al., 2002). Panchanadeswaran and colleagues (2007) used TGP to understand the vulnerability of female sex workers to HIV due "to poverty and lack of educational resources…women's vulnerability in the context of client/partner violence, alcohol use, male partner's high-risk behaviors, and women's lack of control in their intimate relationships; and…the role of traditional heterosexual gender norms in the outcomes of sexual negotiation" (p. 156).

DePadilla and colleagues (2011) sought to articulate pathways between constructs from TGP and their associations with sexual behavior. They found that theoretical associations yielded a well-fitting structural model, facilitating future

development and analyses of interventions based on TGP (DePadilla et al., 2011). Wingood and colleagues (2002) and DePadilla and colleagues (2011) use TGP to conceptualize a number of different risk factors and exposures that increase women's vulnerability for adverse sexual health outcomes (see **Table 4**).

The current study will build off previously described research to explore the application of TGP to correlates of psychological aggression victimization and consistent contraception and condom use. This will expand the scope of how TGP has been tested and provide theoretical associations that can be used in the development of interventions to improve sexual health outcomes for African American young women. A limitation of TGP is the nebulous manner in which constructs interact to affect health outcomes; it operates more as a framework/model than a true theory of behavior change. The current study will further examine the mechanisms of interactions between TGP constructs and psychological aggression victimization and consistent contraception and condom use.

Table 4. Interpretation of the Theory of Gender and Power: Structures, Exposures, and Risk Factors (DePadilla et al., 2011; Wingood & DiClemente, 2002)

Sexual Division of Power	
Physical Exposures	**Behavioral Risk Factors**
• Emotional abuse • Physical abuse • Sexual abuse • Coerced sex • A partner who disapproves of practicing safer sex • Fear of condom negotiation • A high-risk steady partner • A greater exposure to sexually explicit media • Limited access to prevention	• A history of alcohol and drug abuse • Substance use during sex • Poor assertive communication skills • Communication frequency • Communication self-efficacy • Poor condom use skills • Refusal self-efficacy • Limited perceived control over condom use
Cathexis	
Social Exposures	**Personal Risk Factors**
• A partner who is older • A desire or a partner who desires to conceive • Conservative cultural and gender norms • Conservative religious beliefs • A religious affiliation that forbids the use of contraception • A strong mistrust of the medical system • Family influences not supportive of prevention • Parental communication • Peer norms not supportive	• Limited knowledge of prevention • Negative beliefs not supportive of safer sex • Perceived invulnerability • A history of depression or psychological distress • Self-esteem
Sexual Division of Labor	
Economic Exposures	**Socioeconomic Risk Factors**
• Live at the poverty level • Have less than a high school education • Have no employment or are underemployed • Have a high demand–low control work environment • Have limited or no health insurance • Have no permanent home (are homeless)	• Are ethnic minorities • Are younger (less than eighteen years of age)

III. LITERATURE REVIEW

In addition to the exposures and risk factors identified by Wingood, DePadilla, and colleagues, the literature identifies other factors that increase women's vulnerability for adverse sexual health outcomes. This review of scholarly journal articles and conference proceedings will examine the prevalence and predictors of psychological aggression by male intimate partners; the relationship between intimate partner violence victimization and contraception use; and the prevalence and predictors of contraception use among students attending historically black colleges and universities.

PSYCHOLOGICAL AGGRESSION VICTIMIZATION OF YOUNG WOMEN

Psychological aggression is defined as, "Use of verbal and non-verbal communication with the intent to: a) harm another person mentally or emotionally, and/or b) exert control over another person" (Breiding et al., 2015, p. 15). The National Longitudinal Study of Adolescent Health (Add Health) is an ongoing study of a nationally representative sample of adolescents who were in grades 7–12 in the United States during the 1994–1995 school year (Carolina Population Center, n.d.-a). The Add Health cohort has been followed into young adulthood with four waves of in-home interviews (Carolina Population Center, n.d.-a). Add Health Wave II (1996) found that 29% of female adolescents experienced psychological violence in opposite-sex romantic relationships (Halpern et al., 2001). A cross-sectional study of students from 26 high schools in the United States published in 2014 found that 33% of students in relationships disclosed dating violence victimization, while 20% reported perpetrating dating violence (Coker et al., 2014). Victimization of

psychological dating violence was more frequently disclosed (23%) than physical dating violence (13%) (Coker et al., 2014). Rates of both dating violence victimization and perpetration were highest among female students (Coker et al., 2014). A cross-sectional study of undergraduate women at four historically black colleges and universities found that nearly two-thirds (65%) of the women reported experiencing intimate partner violence at least once in the previous year (Barrick et al., 2013). A higher percentage of female students experienced psychological or controlling violence (64%) than either physical (18%) or sexual (1%) violence (Barrick et al., 2013). In this study, controlling violence was defined as the young woman's partner monitoring her time, making her account for her whereabouts, or keeping her from doing things with her family or friends (Barrick et al., 2013).

A qualitative study of 38 African American high school students in New Orleans revealed that students perceived individual-level and family-level factors as the most important reasons for dating violence (Storer, Madkour, et al., 2020). Themes associated with individual-level factors were mental-health and emotional issues; poor communication skills; and perceived gender norms (Storer, Madkour, et al., 2020). Themes associated with family-level factors included witnessing intrafamilial violence; lack of parental monitoring; single-parent households; and parent-to-child physical abuse (Storer, Madkour, et al., 2020). When asked about specific precipitating events, respondents described situations involving lack of trust, jealousy, peer pressure, and "cheating" (Storer, Madkour, et al., 2020). Most respondents defined males hitting and/or slapping a female as "always" dating violence but when asked about females hitting and/or slapping males, some

specified that if it was "justified" (e.g. cheating) or assumed it was with little force, therefore not dating violence (Storer, Talan, et al., 2020). Respondents also reported different standards for dating violence associated with sexual activities; most felt that males forcing females to participate in sexual acts is dating violence but when the aggressor is female, some disagreed (Storer, Talan, et al., 2020).

Over 60% of first-year students at a consortium of historically black colleges and universities reported that a partner had checked up on them or wanted to know where they were at all times, while 10% reported having their partner slap, punch, kick, bite, choke, or burn them (Hayes et al., 2009). Two studies of university students, one cross-sectional and one longitudinal found that experiencing psychological aggression from a partner predicted an increased level of personal distress, although participants did not perceive their relationship as a source of stress (Arriaga & Schkeryantz, 2015). Arriaga and Schkeryantz (2015) state that this "suggests a pattern of 'invisible harm' in which individuals victimized by psychological aggression may not recognize the harm they are experiencing" (p. 1332).

Prospective data from Add Health Waves II (1996) and III (2001) showed that 40% of young adults reported physical or sexual violence victimization by an intimate partner at some point in their lives (Halpern et al., 2009). Eight percent experienced intimate partner violence (IPV) only in adolescence, 25% only in young adulthood, and 7% showed persistent victimization (Halpern et al., 2009). A sample from Add Health Wave III showed that 47% of respondents experienced some form of IPV in their romantic relationships, and the majority reported bidirectional

violence (Renner & Whitney, 2012). For young adult women, childhood neglect and physical abuse, violence perpetration during adolescence, a history of suicide attempts, being married, and living with a partner predicted IPV outcomes (Renner & Whitney, 2012). Among a cross-sectional sample of young adults, lifetime violence-related behaviors, number of lifetime sexual partners, and number of children were significant risk factors for IPV (Acevedo et al., 2013). The link between number of children and IPV risk was moderated by education and was stronger for women than men (Acevedo et al., 2013). The World Health Organization's Multi-country Study on Women's Health and Domestic Violence found that secondary education, high socioeconomic status, and marriage offered protection from IPV, while alcohol abuse, cohabitation, young age, attitudes supportive of partner violence, having outside sexual partners, experiencing childhood abuse, and growing up with domestic violence, increased the risk of IPV (Abramsky et al., 2011).

Research suggests that younger women (ages 18 to 29) are at higher risk of IPV victimization than any other age group and that IPV reaches its peak during late adolescence and young adulthood (Barrick et al., 2013; Johnson et al., 2014). Research also indicates that women of color experience IPV at higher rates than white women (Barrick et al., 2013; Capaldi et al., 2012). However, effects of race may be confounded by other factors (Capaldi et al., 2012). Analysis of Behavioral Risk Factor Surveillance System (BRFSS) data from eight U.S. states found that after controlling for age, marital status, and income, race was no longer a risk factor (Capaldi et al., 2012; Vest et al., 2002). Among African American women, increased

relationship length and partner education are negatively associated with IPV, whereas alcohol use, experiencing childhood violence, and partner approval of spousal aggression are positively associated with IPV (Caetano et al., 2000). Victims of IPV reported more symptoms of recent depression than non-victims (Hathaway et al., 2000).

Relationship Between IPV & Contraception Use

Research has found that adolescent young women in physically abusive relationships were three times more likely to become pregnant than non-abused young women (Roberts et al., 2005). Women experiencing intimate partner violence both prior to and during pregnancy are at risk for multiple poor maternal and infant health outcomes (Silverman et al., 2006). Many studies have identified an association between IPV and inconsistent condom use (Alleyne et al., 2011; Collins et al., 2005; Lang et al., 2011; Sales et al., 2008; Seth et al., 2013; Silverman et al., 2001, 2004, 2011; Teitelman et al., 2008; Wingood et al., 2001). A retrospective study of 522 African American adolescent females found that a history of dating violence was associated with being 2.8 times more likely to have had an STD and half as likely to use condoms consistently in the past six months (Wingood et al., 2001). The same study found that adolescents with a history of dating violence were nearly three (2.8) times more likely to fear the perceived consequences of negotiating condom use and more than two and a half (2.6) times more likely to fear talking with their partner about pregnancy prevention (Wingood et al., 2001). A study of sexually active African American women ages 18 to 29 found that women in

abusive relationships were less likely than others to use condoms (Wingood & DiClemente, 1997).

A qualitative study of sexually active young women ages 15 to 20 with a history of intimate partner violence found that 32% became pregnant while in an abusive relationship and 59% of those who became pregnant within an abusive relationship reported that those pregnancies were unwanted (E. Miller et al., 2007). Approximately one quarter (26%) of young women interviewed reported that their abusive male partners were actively trying to get them pregnant (E. Miller et al., 2007). Pregnancy-promoting behaviors of abusive male partners described by the young women included manipulating condom use, sabotaging birth control use, and making explicit statements about wanting her to become pregnant (E. Miller et al., 2007).

Data from Add Health Waves I and II found that young women' odds of consistent contraceptive use decreased if the relationship involved physical violence (Manlove et al., 2004). Cross-sectional data from 973 sexually active, dating female adolescents surveyed for Wave II showed that current involvement in a verbally abusive relationship was associated with not using a condom during last intercourse (Roberts et al., 2005). Both a history of and current involvement in a physically abusive relationship were associated with a history of pregnancy (Roberts et al., 2005). Data from the Youth Risk Behavior Survey show that physical and sexual dating violence against adolescent young women is associated with increased risk of sexual risk behaviors such as not using condoms (Silverman et al., 2001). Most studies identified in the literature were cross-sectional, limiting the ability to

determine causality between IPV and contraceptive use (Bergmann & Stockman, 2015).

CONTRACEPTION USE AMONG HBCU STUDENTS

Historically black colleges and universities (HBCUs) are a cornerstone of the African American community and have been the mainstay of educating African Americans at the college and university levels (Bracey, 2017; US Commission on Civil Rights, 2010; Younge et al., 2013). HBCUs differ substantially from traditionally white institutions (TWIs): HBCUs typically have smaller enrollments, a lower student-faculty ratio, and higher student-faculty interactions, characteristics that are positively associated with student development (US Commission on Civil Rights, 2010). However, HBCUs tend to have fewer resources compared to TWIs, such as lower expenditures for each full time equivalent student, lower average faculty salaries, and poorer physical facilities (US Commission on Civil Rights, 2010). Additionally, the family backgrounds of students enrolled in HBCUs are on average less affluent than students attending TWIs (US Commission on Civil Rights, 2010). Nevertheless, graduates of HBCUs are more likely to have felt supported while in college and to be thriving afterward than their African American peers who graduated from TWIs (Gallup & USA Funds, 2015). There is a small but growing body of literature on the health of African American college students. However, much of the past research has focused on African American students attending TWIs and, therefore, may not be generalizable to the unique environment of HBCUs (Younge et al., 2013).

Historically black colleges and universities (HBCUs) enroll 25% of college-educated African American young adults; however, there is limited information about contraception use and other health behaviors among students attending HBCUs (Hayes et al., 2009; Sutton et al., 2011). A survey of 1,115 first-year students at a consortium of HBCUs found that relatively few female respondents (or the female partners of male respondents) reported hormonal contraceptive use during their last sexual intercourse (Hayes et al., 2009). The most common form of contraception reported at last sexual encounter was condoms (63%), followed by birth control pills (13%), withdrawal (7.1%), Depo-Provera (1.7%), and other (3.2%) (Hayes et al., 2009). Hayes and colleagues compared these results to data from African American first-year college students surveyed by the American College Health Association and found that more students in the HBCU sample used condoms, but fewer used birth control pills at last intercourse (Hayes et al., 2009).

Predictors of condom use among HBCU students have been identified as having less substance use, not using substances before intercourse, self-efficacy for safer sexual practice, and positive experiences/attitudes towards condoms (Alleyne, 2008; Browne et al., 2009; Burns & Dillon, 2005; El Bcheraoui et al., 2013; Poulson et al., 2008; Sutton et al., 2011; Valentine et al., 2003; Younge et al., 2013). A study of 189 African American female students aged 18 to 24 from an HBCU in the Southeastern United States found that casual sexual relationships and high condom use self-efficacy were positively associated with condom use, while substance use was negatively associated with condom use (Alleyne, 2008). A survey of 824 sexually active students attending 24 HBCUs found that condom use during last

sexual intercourse was significantly more likely among students who resided on campus, and whose reason for using condoms included disease prevention (El Bcheraoui et al., 2013). Condom use during last sexual intercourse was significantly less likely among students whose mothers did not graduate from high school, who worked less than 20 hours per week and who perceived themselves at average or high risk of HIV (El Bcheraoui et al., 2013). Spontaneity of sexual encounters and partner-related perceptions of trust were also associated with condom non-use (El Bcheraoui et al., 2013).

Focus groups conducted by Chandler and colleagues (2016) among African American female students at an HBCU and a traditionally white institution (TWI) showed that motivators for practicing safe sex were related to the desire to avoid pregnancy and to cultural and religious expectations. Religious expectations were described as the belief that marriage was a prerequisite for sexual intercourse and that premarital sexual behavior was "sinful" (Chandler et al., 2016). These focus groups also found that barriers to practicing safe sex included issues of accountability, stigma associated with accessing prevention services, and media influences (Chandler et al., 2016). The responses from women at the TWI and HBCU were similar and the thematic representations were grouped together by the study authors (Chandler et al., 2016).

Given the limited existing research about contraception use among HBCU students, the literature review was expanded to include research on college students and African American adolescents more broadly. Analysis of the Spring 2007 American College Health Association–National College Health Assessment

showed that African American college students reported lower use of hormonal contraceptives, more sexual partners, and higher rates of adverse sexual health outcomes than white college students (Buhi et al., 2010). However, African American students were more likely to use condoms and to have been tested for HIV (Buhi et al., 2010). Among college students of all races, the Spring 2016 American College Health Association–National College Health Assessment showed that the most common form of contraception reported at last vaginal intercourse was male condom (69%), followed by birth control pill (62%), withdrawal (29%), intrauterine device (8%), implant (7%), fertility awareness (6%), injection (5%), spermicide (5%), ring (3%), patch (2%), sterilization (2%), female condom (1%), diaphragm or cervical cap (1%), and other (2%) (American College Health Association, 2016).

Among all college students, oral contraceptive use has been shown to increase with year in school, with 54% of 4th year female college students using oral contraception with their current sexual partner(s) compared to 27% of 1st year female college students (Siegel et al., 1999). Older college students increasingly relied on the female partner in a heterosexual relationship to provide contraception (Siegel et al., 1999). Pregnancy prevention was frequently included as a reason for using contraception: 45% of college students reported that they used contraception for both pregnancy and disease prevention, while 28% listed pregnancy prevention only (Siegel et al., 1999). Attending a 4-year university has been shown to be a protective factor for contraceptive and condom use, with odds of sex without a condom, sex without reliable birth control, unplanned pregnancy, and STIs being

significantly lower among 4-year students than 2-year (Eisenberg et al., 2014). Despite lower odds, the risk of unintended pregnancy and sexually transmitted infection remains for students of 4-year universities (Eisenberg et al., 2014).

A prospective study of 375 non-pregnant sexually active African American young women aged 14 to 18 found that adolescents "who were inconsistent contraceptive users at follow-up were more likely to have reported a desire for pregnancy, previous inconsistent contraceptive use, less frequent communication with their partners about prevention issues, and an increased number of lifetime sexual partners" (Davies et al., 2006, p. 43). A cross-sectional study of 522 sexually active African American adolescent young women ages 14 to 18 in the Southern United States found that infrequently communicating with sex partners about sexually transmitted diseases and pregnancy prevention was significantly associated with lower odds of condom use (Crosby et al., 2002). A survey of 150 African American or Latina young women ages 14 to 17 found that compared with adolescents whose first partner had been roughly their age, young women whose first sexual partner was three or more years older than themselves were more likely to be younger at first intercourse and less likely to report using condoms at first intercourse, last intercourse, in the previous six months, or consistently over their lifetime (K. S. Miller et al., 1997). Adolescent young women with an older first partner were also more likely to have ever been pregnant than those with a peer-age partner (K. S. Miller et al., 1997).

There are many factors that can affect a woman's receptiveness to different methods of contraception, including pregnancy expectations. Receptiveness can be

defined as a woman's openness to or interest in using a particular method. A qualitative study showed that for young adult women, desire to avoid pregnancy is a primary factor for receptiveness to long-acting reversible contraception (LARC) (Higgins, 2017). Young women with mixed or ambivalent feelings toward pregnancy, those who anticipated pregnancy within a few years, and those in long-term relationships were less likely to be in favor of LARC use, while those in college or beginning careers were more likely to be receptive to LARC use (Higgins, 2017). A nationally representative survey of 1,978 adult women found that ambivalence about avoiding pregnancy was strongly associated with both contraception nonuse and inconsistent use (Frost et al., 2007). Other predictors of inconsistent contraception use were having less than a college education, being African American, having infrequent sexual intercourse, not being in a current relationship, and being dissatisfied with one's contraceptive method (Frost et al., 2007). Given the high rates of adolescent births, unintended pregnancy, STIs, and IPV in Louisiana, it is essential to understand the factors that contribute to psychological aggression and consistent use of condoms and other forms of contraception. The current studies provide valuable insight into the sexual behaviors of African American late adolescent women in Louisiana.

IV. RESEARCH FRAMEWORK & PURPOSE

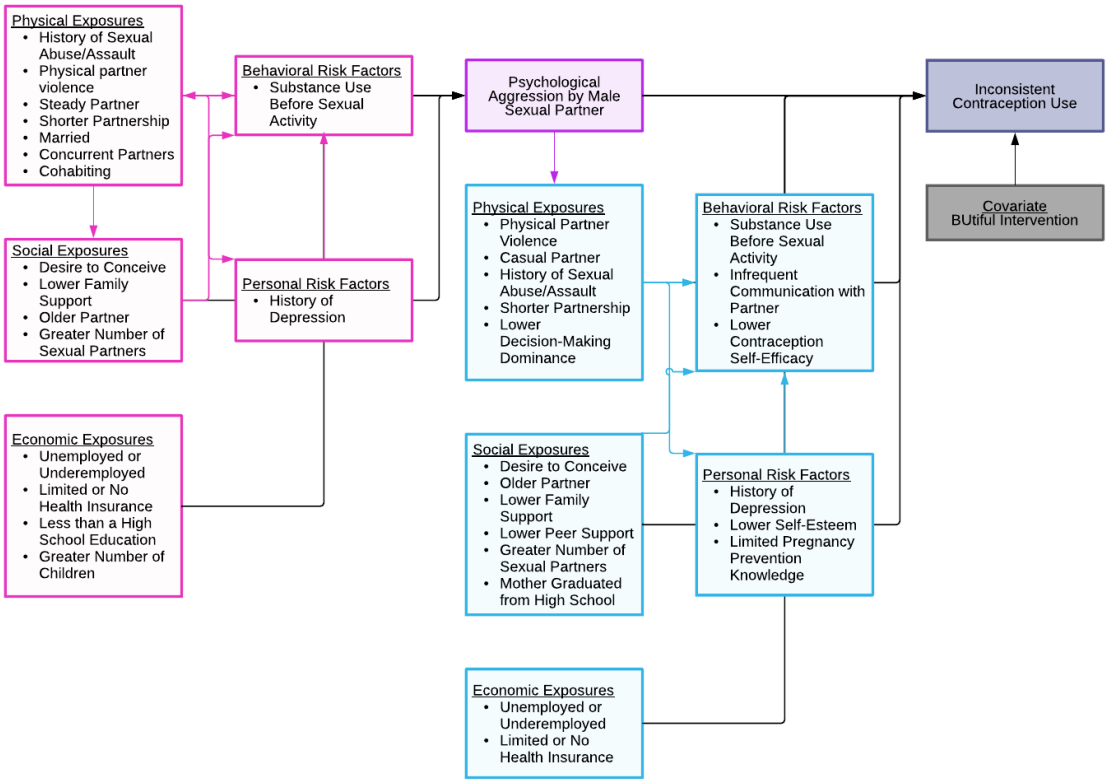
CONCEPTUAL MODEL

Based on the existing literature described above, a conceptual model was developed for the current study to apply TGP to predicting psychological aggression by male intimate partners and inconsistent contraception use among 18- and 19-year-old African American young women. The hypothesized model for applying TGP in this study is described in **Figure 1**. The pink boxes show predictors of psychological aggression by a male intimate partner and the blue boxes show predictors of inconsistent contraception use. Predictors are grouped by the construct they represent in TGP: Physical Exposures, Behavioral Risk Factors, Social Exposures, Personal Risk Factors, and Economic Exposures. Psychological aggression by a male intimate partner is itself a physical exposure that can affect contraception use (DePadilla et al., 2011). Wingood and colleagues (2002) explain that all three structures interact to cause an adverse impact on women's health.

The pink and blue arrows in the conceptual model show relationships between predictors. Prior research has shown an association between the physical exposure of child sexual abuse and the personal risk factor of depression (DePadilla et al., 2011; Howard & Wang, 2005; Schraedley et al., 1999). Physical and social exposures have also been shown to influence behavioral risk factors among adolescents (DePadilla et al., 2011). Substance use has been correlated with experiencing sexual abuse among adolescents (DePadilla et al., 2011; Silverman et al., 2001). Personal risk factors may impact behavioral risk factors, specifically self-esteem has demonstrated an association with partner communication (DePadilla et

al., 2011; L. F. Salazar et al., 2005). Some of the young women in the study participated in an internet-delivered pregnancy prevention intervention that was designed to increase consistent contraception use among sexually active participants and may confound the current study (Kissinger et al., 2015). Given the potential of confounding by the intervention, study arm has been included as a covariate.

Figure 1. Conceptual Model for Sexual Risk Behaviors among 18- and 19-year-old African American Young women Based on the Theory of Gender and Power[1]



[1] The pink boxes show predictors of psychological aggression by a male intimate partner and the blue boxes show predictors of inconsistent contraception use. The pink and blue arrows show relationships between predictors.

SPECIFIC AIMS

The goal of the proposed project is to determine the prevalence, predictors, and impacts of psychological aggression victimization and consistent contraception and condom use among African American girls ages 18 and 19 in Orleans Parish, Louisiana. Previous research has identified a number of predictors of psychological aggression and found a positive association between intimate partner violence and decreased condom and contraceptive use (Acevedo et al., 2013; Barrick et al., 2013; Bergmann & Stockman, 2015; Dardis et al., 2014; Halpern et al., 2009; Johnson et al., 2014; Manlove et al., 2004; O'Donnell et al., 2009; Renner & Whitney, 2012). However, most previous studies were cross-sectional, limiting the ability to determine causality between intimate partner violence and contraception use (Bergmann & Stockman, 2015). Understanding factors that increase risk for unintended pregnancy and experiencing psychological aggression is essential for developing effective interventions to improve the sexual health of late adolescents. Data specific to African American young women in New Orleans will influence the development of interventions to address Louisiana's high rates of IPV and unintended pregnancy.

AIM 1

To identify the prevalence and predictors of psychological aggression by male intimate partners among 18- and 19-year-old African American women in the greater New Orleans area. The hypothesis is that correlates of psychological aggression by a male intimate partner will include the following partner-level physical exposure: partnership type; partner-level behavioral risk factor: substance

use before sexual activity; partner- level social exposure: age difference of partner; individual-level physical exposures: sexual abuse, forced sexual activity, and coerced sexual activity; individual-level social exposures: positive orientation toward early motherhood, family support, and lifetime sexual partners; individual-level personal risk factor: depressive symptoms; and individual-level economic exposures: level of education, hours worked per week, health insurance, and number of live births.

Aim 2

To identify the relationship between psychological aggression victimization and consistent contraception and condom use among 18- and 19-year-old African American women in the greater New Orleans area. The hypothesis is that experiencing psychological aggression from a male sexual partner will reduce consistent contraception and/or condom use in sexual partnerships.

Aim 3

To identify the prevalence and predictors of consistent contraception use among 18- and 19-year-old female students attending historically black colleges and universities in New Orleans. The hypothesis for the current study is that potential predictors of inconsistent contraception use will include the following individual level physical exposures: history of forced sexual activity; behavioral risk factors: contraceptive self-efficacy; social exposures: mother's education level and perceived family support; and personal risk factors: self-esteem.

V. METHODS

STUDY CONTEXT

The current study will be secondary data analysis of the "You Geaux Girl!" program evaluation conducted by Tulane University School of Public Health and Tropical Medicine from 2010 to 2015 (Kissinger et al., 2015). The "You Geaux Girl!" study collected survey and biological data from 656 African American young women ages 18 and 19 in the greater New Orleans area; 459 participants (70%) consented for follow-up secondary data analysis. "You Geaux Girl!" was a randomized controlled evaluation of BUtiful, an internet-delivered pregnancy prevention intervention funded by the Office of Adolescent Health. BUtiful was adapted from the evidence-based intervention Sisters Informing Healing Living and Empowering (SIHLE). The SIHLE curriculum draws upon two social science theories: Social Cognitive Theory and the Theory of Gender and Power (DiClemente et al., 2004). "You Geaux Girl!" was a randomized control trial that compared the BUtiful intervention to DIVAS, the control condition, which was an internet-delivered health and wellness program.

The "You Geaux Girl!" survey included demographic information, sexual experience, sexual partner and relationship characteristics (including IPV), contraception and condom use, pregnancy intentions, pregnancy prevention knowledge, contraceptive self-efficacy, pregnancy status, and sexually transmitted infection diagnosis. Biological data included testing for pregnancy, chlamydia, and gonorrhea. Data were collected at baseline, 4-month follow-up, 7-month follow-up, and 13-month follow-up. See **Appendix A** for the survey instrument. The "You

Geaux Girl!" data provides valuable insight into the sexual health behaviors and experiences of African American young women.

Participants for the "You Geaux Girl!" study were recruited over a period of two years through partner sites and community events, which were chosen to allow participation by African-American young women from a range of economic backgrounds and experiences (Kissinger et al., 2015). Partner sites included a community college, three historically black universities, and an adolescent health clinic (Kissinger et al., 2015). All participants (n=656) were African American young women ages 18 and 19 living in Orleans or Jefferson Parishes; 459 participants (70%) consented for secondary data analysis. Young women were ineligible if they were currently pregnant or intending to become pregnant in the next year or identified as intending to have sex with women exclusively (Kissinger et al., 2015). Over half of the participants in the "You Geaux Girl!" evaluation were HBCU students, providing a unique opportunity to examine sexual health behaviors and determinants in this population. At each measurement, participants responded about up to five male sexual partners in the prior three months. Preliminary analyses of the "You Geaux Girl" study showed that psychological aggression was directly associated with increased odds of inconsistent condom use, although it was unrelated to inconsistent contraception use (Madkour et al., 2014). See **Appendix B** for the "You Geaux Girl" Office of Adolescent Health evaluation abstract.

ANALYSIS PLAN

Participants who consented to secondary data analysis and reported on at least one male partner sexual partner were included in analysis. Data were cleaned

by research staff prior to analysis. Preliminary analysis conducted by the original study team shows that there are no differences on selected characteristics for those who had all data compared to those who had any missing data, although it is possible that they differ based on unobserved data (Kissinger et al., 2015). This indicates the data are missing at random, and therefore ignorable when using likelihood inference and standard longitudinal data software allowing for unbalanced data can be used (Ibrahim & Molenberghs, 2009; Wu, 2010).

The methods and procedures were reviewed and approved by the Tulane University Institutional Review Board. Data sets were reshaped from wide to long format so that there was a separate observation for each partnership at each time point. Two different data sets were used, the baseline data set and a merged data set that included baseline data and data from follow-up data collection. When the baseline and follow-up data sets were merged, there was a loss of data that resulted in the longitudinal sample containing fewer participants than included at baseline. An overview of the methods for the paper describing each research aim is described below, more detailed information is provided in subsequent sections.

PAPER 1

To avoid confounding by the study or control intervention, analysis of the prevalence and correlates of psychological aggression by male intimate partners was conducted on the baseline secondary data set (n=459). Only participants reporting at least one male sexual partner in the previous three months (n=408) were included in analysis. The total number of partnerships that were analyzed is 537. Univariate and bivariate descriptive analyses were conducted to explore

individual independent variables and their effects on psychological aggression victimization. More information about preliminary analyses can be found in **Appendix C**.

A two-level generalized linear mixed model (GLMM) was used to identify correlates of psychological aggression victimization by a male sexual partner (Hoffman, 2013). Level one of the multilevel model was the reported sexual partners, who are nested within individual participants, who were level 2. The outcome variable is a count variable with a limited range. Therefore, negative binomial distribution with a log link function was used to transform the outcome to a continuous, unbounded outcome that was predicted by the generalized linear mixed model (Hedeker, n.d.; Hoffman, 2015). Adaptive quadrature was used to fit the model and odds ratios were used to interpret results. Multivariable regression analysis was used to assess interaction between variables.

PAPER 2

Analysis of the relationship between psychological aggression by male intimate partners and consistent contraception and condom use was conducted on the merged secondary data set (n=321). This data set only included participants reporting on at least one male sexual partner. The total number of partnerships that were analyzed is 553. Univariate and bivariate descriptive analyses were conducted to explore individual independent variables and their effects on consistent contraception use. More information about preliminary analyses can be found in **Appendix D**.

Generalized estimating equations (GEE) were used to identify the relationships between psychological aggression victimization and consistent contraception and condom use. The outcome variables are dichotomous (inconsistent versus consistent contraception/condom use) so a negative binomial link function was used to transform the outcome.

PAPER 3

To avoid confounding by the study or control intervention, analysis of the prevalence and correlates of consistent contraception use was conducted on the baseline secondary data set (n=459). Only participants reporting at least one male sexual partner in the previous three months (n=408) were included in analysis. The sample was restricted to the participants who attended an HBCU (n=211). The total number of partnerships that were analyzed is 275. Univariate and bivariate descriptive analyses were conducted to explore individual independent variables and their effects on consistent contraception use. More information about preliminary analyses can be found in **Appendix E**.

A two-level generalized linear mixed model (GLMM) was used to identify predictors of consistent contraception use among the subset of participants who attended HBCUs (Hoffman, 2013). Level one of the multilevel model is the reported sexual partners, who are nested within participants, who are level 2. The outcome variable is dichotomous so a logit link function was used to transform the outcome to a continuous, unbounded outcome that was predicted by the generalized linear mixed model (Hedeker, n.d.; Hoffman, 2015).

VI. PAPER 1: PREVALENCE & PREDICTORS OF PSYCHOLOGICAL AGGRESSION BY MALE SEXUAL PARTNERS AMONG AFRICAN AMERICAN LATE ADOLESCENT WOMEN IN THE URBAN SOUTH

ABSTRACT

Intimate partner violence (IPV) includes physical violence, sexual violence, stalking, and psychological aggression by a current or former spouse, dating partner, or ongoing sexual partner. Emerging adults are at higher risk of IPV than any other age group and women of color experience IPV at higher rates than white women. African American female adolescents who have experienced IPV are more likely to exhibit unhealthy sexual behaviors than their non-victimized peers. Psychological aggression is more common among late adolescents than other forms of IPV. This study applied the Theory of Gender and Power to examine the prevalence and correlates of psychological aggression by male sexual partners. Study participants were surveyed as part of an online pregnancy prevention intervention evaluation. All participants were African American women ages 18–19 living in New Orleans, Louisiana. Data were collected at baseline among 408 women with 537 male partners using established measures. A generalized linear mixed model was used to examine partners nested within women. Psychological aggression victimization was reported in 52% of all partnerships. Of 14 hypothesized correlates, there was a significant relationship between psychological aggression victimization and 1) being in a steady relationship ($p < 0.0001$) and 2) experiencing depressive symptoms ($p = 0.0103$). For young women with a steady partner, the likelihood of psychological aggression victimization increased by a

factor of 3.12 (CI=1.95–5.00), compared to casual partnerships. For young women with depressive symptoms, the likelihood of psychological aggression victimization was 2.58 (CI=1.25–5.31) greater than those without. These findings suggest the importance of educating young women and men about healthy relationship skills, particularly those who are in long-term partnerships. These results also suggest that depressive symptoms and psychological aggression victimization may be comorbid conditions that should be screened for together to identify young women at need for mental health services and relationship skill-building.

INTRODUCTION

Intimate partner violence (IPV) includes physical violence, sexual violence, stalking, and psychological aggression by a current or former spouse, dating partner, or ongoing sexual partner (Breiding et al., 2015). In 2015, a panel convened by the Centers for Disease Control and Prevention (CDC) updated the definition of IPV to include stalking and expanded the definition of psychological aggression (formerly referred to by a number of different names, i.e., psychological abuse, verbal aggression, emotional violence, etc.) to the "use of verbal and non-verbal communication with the intent to: a) harm another person mentally or emotionally, and/or b) exert control over another person" (Breiding et al., 2015, p. 15). The majority of research on IPV focuses on physical or sexual IPV (Capaldi et al., 2012). There is little evidence available on psychological aggression among late adolescents, although limited research does indicate that psychological aggression is more prevalent than physical or sexual IPV (Barrick et al., 2013; Coker et al., 2014; Hayes et al., 2009).

Research suggests that young women (ages 18 to 29) are at higher risk of overall IPV victimization than any other age group and that IPV reaches its peak during late adolescence and young adulthood (Abramsky et al., 2011; Barrick et al., 2013; Johnson et al., 2014). Research also indicates that women of color experience IPV at higher rates than white women (Barrick et al., 2013; Capaldi et al., 2012). The National Longitudinal Study of Adolescent Health (Add Health) Wave IV (2008) found that 21% of young adults (ages 24 to 32) experienced psychological aggression (Sorgi et al., 2016). Previous data from this cohort, Add Health Wave II (1996), found that 29% of female adolescents ages 12 to 21 experienced psychological aggression in opposite-sex romantic relationships (Halpern et al., 2001).

Adolescents who have experienced IPV are more likely to exhibit a wide variety of unhealthy sexual behaviors, attitudes, beliefs, and norms than their peers who have not experienced IPV (Silverman et al., 2011; Wingood et al., 2001). For African American female adolescents, these include having partners who are not monogamous, using condoms inconsistently, fearing perceived consequences of negotiating condom use, fearing talking with their partner about pregnancy prevention, having a higher perceived risk of acquiring a sexually transmitted disease, perceiving less control over their sexuality, having peer norms that are not supportive of using condoms, and having norms that are not supportive of having a healthy relationship (Wingood et al., 2001). Adolescents and young adults with a history of IPV were also more likely to have a sexually transmitted disease and to

become pregnant than those who had not experienced IPV (Hess et al., 2012; O'Donnell et al., 2009; Roberts et al., 2005; Wingood et al., 2001).

In a study of students at historically black colleges and universities (HBCUs), nearly two-thirds (65%) of female students reported experiencing any IPV at least once in the previous year (Barrick et al., 2013). HBCU students report higher levels of psychological aggression than physical or sexual violence (Barrick et al., 2013; Hayes et al., 2009). Research among university students found that experiencing psychological aggression from a partner predicted an increased level of personal distress, although participants did not report their relationship as a source of stress (Arriaga & Schkeryantz, 2015). Arriaga and Schkeryantz (2015) suggest that this represents a pattern of "invisible harm" where the victims of psychological aggression may not recognize the harm they are experiencing as a result of their relationship. Among high school students in romantic relationships, victimization of psychological aggression was more frequently disclosed (23%) than physical violence (13%) (Coker et al., 2014). Rates of both IPV victimization and perpetration were highest among female students (Coker et al., 2014).

Previous research among African American high school students in the urban South revealed that students perceived certain individual-level and family-level factors as the most important reasons for IPV (Storer, Madkour, et al., 2020). Specifically, themes associated with individual-level factors were unresolved trauma, substance abuse, personal characteristics (e.g., anger issues, need to be in control, insecurity, lack of trust), personal choices, self-esteem, and desire to be in a

relationship (Storer, Madkour, et al., 2020). Themes associated with family-level factors included absent fathers and unsupportive or abusive home environments.

The aim of the current study is to identify the prevalence and correlates of psychological aggression by male intimate partners among African American young women in the urban South. Previous research has identified a number of correlates of IPV, such as race, age, history of childhood neglect and physical abuse, history of sexual assault, depression, partnership length, being married, partnership concurrency, living with an intimate partner, alcohol use, number of lifetime sexual partners, number of children, lifetime violence-related behaviors, violence perpetration during adolescence, and history of suicide attempts (Abramsky et al., 2011; Acevedo et al., 2013; Barrick et al., 2013; Caetano et al., 2000; Johnson et al., 2014; Renner & Whitney, 2012; Smith et al., 2003). The current study further examines psychological aggression victimization, which is an understudied element of IPV that can have significant health impacts for young women, such as depression and unintended pregnancy (O'Donnell et al., 2009; Roberts et al., 2005; Wingood et al., 2001). This theory-informed study contributes to the body of knowledge on exposures and risk factors that contribute to African American late adolescent women's experiences of psychological aggression victimization by male intimate partners. This research is very timely given the recent cultural shifts in attitude toward sexual harassment and IPV reflected in the #MeToo movement and increased accountability for men's treatment of women (Flicker, 2017).

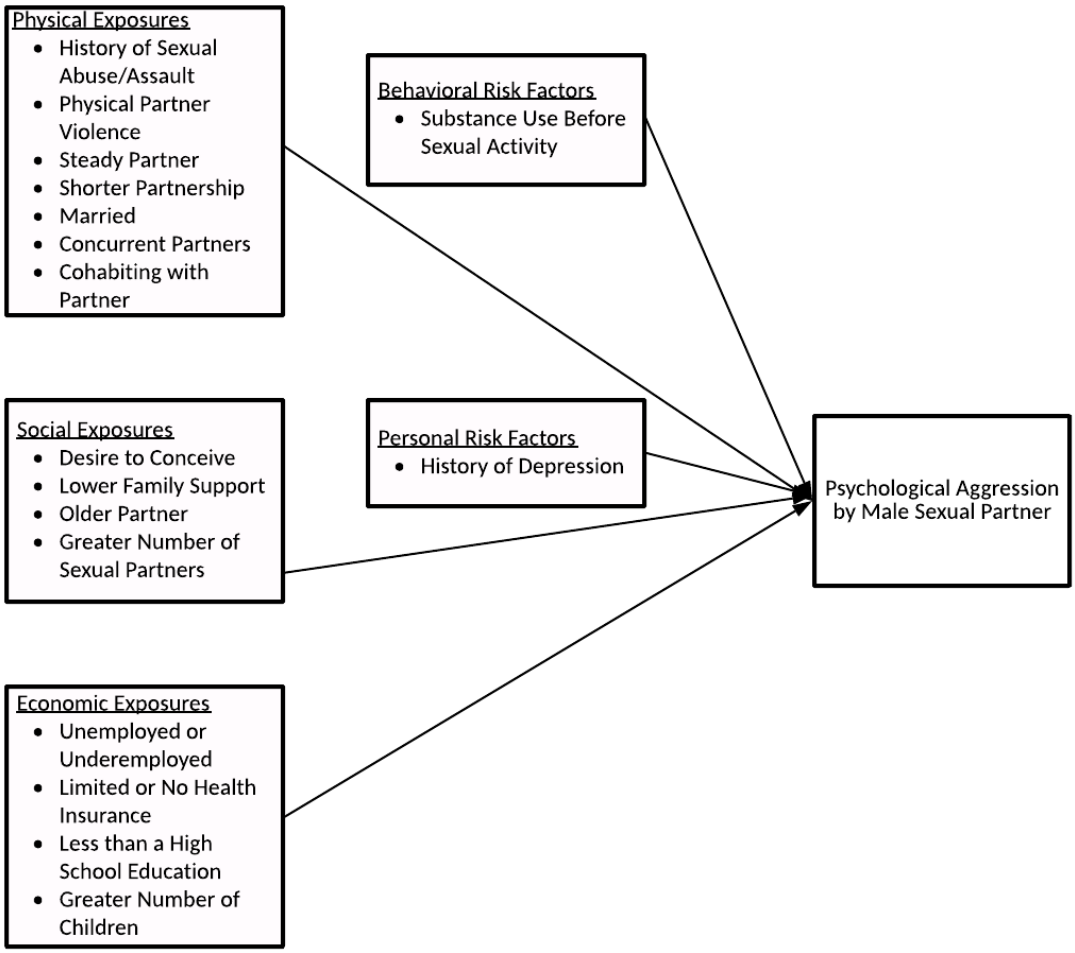
CONCEPTUAL MODEL

The current study uses the Theory of Gender and Power (TGP) as a theoretical framework to guide selection of potential correlates of psychological aggression victimization. TGP proposes and defines three structures that characterize the gendered relationships between women and men as 1) the sexual division of labor, 2) the sexual division of power, and 3) cathexis, which examines the structure of affective attachments and social norms (Connell, 1987; Wingood & DiClemente, 2002). Wingood and DiClemente (2002) adapted TGP for use in public health, expanding the original three structures of TGP into six theoretical constructs. The sexual division of labor can be thought of as creating economic exposures and socioeconomic risk factors, while the sexual division of power results in physical exposures and behavioral risk factors (Wingood & DiClemente, 2002). The structure of affective attachments and social norms (cathexis) produces social exposures and personal risk factors (Wingood & DiClemente, 2002).

The hypothesized model for applying the Theory of Gender and Power (TGP) to the prevalence and correlates of psychological aggression by male intimate partners is described in **Figure 1.1**. Variables were identified as potential correlates based on the previously described literature and identified TGP exposures and risk factors. Correlates are grouped by the TGP construct they represent: Physical Exposures, Behavioral Risk Factors, Social Exposures, Personal Risk Factors, and Economic Exposures. TGP constructs interact to cause an adverse impact on women's health (Wingood & DiClemente, 2002).

Based on TGP and existing literature, the hypothesis for the current study is that correlates of psychological aggression by a male intimate partner will include the following partner-level physical exposure: partnership type; partner-level behavioral risk factor: substance use before sexual activity; partner- level social exposure: age difference of partner; individual-level physical exposures: sexual abuse, forced sexual activity, and coerced sexual activity; individual-level social exposures: positive orientation toward early motherhood, family support, and lifetime sexual partners; individual-level personal risk factor: depressive symptoms; and individual-level economic exposures: level of education, hours worked per week, health insurance, and number of live births (Acevedo et al., 2013; Barrick et al., 2013; Smith et al., 2003; Vest et al., 2002; Wingood & DiClemente, 2002). Although there is substantial evidence linking some of these correlates to psychological aggression, this study extends the previous literature by also including exposures and risk factors identified by TGP and by examining psychological aggression among late adolescent African American young women. While TGP has primarily been used to develop HIV prevention interventions for women, there is reason to anticipate its relevance to psychological aggression, as IPV is inextricably linked to gendered power dynamics in heterosexual relationships (Kelly, 2011).

Figure 1.1. Conceptual Model Based on the Theory of Gender and Power for the Prevalence and Correlates of Psychological Aggression Victimization of 18- and 19-year-old African American Women by Male Intimate Partners



METHODS

MEASURES

Psychological Aggression

The dependent variable was experiencing psychological aggression by a male intimate partner. Respondents reported on up to five male sexual partners in the prior three months. Psychological aggression victimization was measured with seven items from the Revised Conflict Tactics Scale (CTS2; Straus, 1979; Straus et al., 1996). Participants were asked, "in the past three months how many times has

[partner] done any of the following? 1) he has insulted or swore at you; 2) he shouted or yelled at you; 3) he stomped out of the room/house/yard during a disagreement; 4) he said something to make you angry or hurt; 5) he destroyed something belonging to you; 6) he accused you of being no good in bed; 7) he threatened to hit or throw something at you." Following the established scoring scale for CTS2, responses for each item were coded into categories according to the number of times each aggression tactic had occurred: (0) this has never happened or it has happened before, but not in the past 3 months; (1) once; (2) twice; (4) 3–5 times; (8) 6–10 times; (15) 11–20 times; and (25) more than 20 times (Straus et al., 1996). A total score of psychological aggression was created by summing all seven items, for a total possible scale of 0 to 175. Although researchers sometimes score the Conflict Tactics Scale by replacing the 0 to 25 response categories with categories such as never, sometimes, often, and frequently, Straus (1996) states that numerical scores are preferable because they permit the measurement of chronicity, or the number of times the tactics in the scale occurred, among those who engaged in at least one tactic. It is important to note that multiple tactics may be used in a single episode of psychological aggression, and this score represents a total number of times a tactic was used, not the total number of violent episodes.

Correlates

The independent variables were identified based on the Theory of Gender and Power and from existing literature. They included substance use before sexual activity, partnership type, age difference of partner, depressive symptoms, level of education, employment status, health insurance, number of live births, sexual abuse,

forced sexual activity, coerced sexual activity, pregnancy expectations, family support, and lifetime sexual partners, each of which is described below. To facilitate interpretation of the intercept and main effects, each predictor was centered such that 0 was a meaningful value (Hoffman, 2015).

Partnership Type

Partnership type was measured by asking, "Is [partner] your main or casual partner? Responses were coded as (0) Casual or (1) Main/Steady.

Substance Use

Substance use before sexual activity was measured by asking, "In the past three months, how often did you drink or use drugs before having sex with [partner]?" Responses were categorized as (0) Never, (1) Some of the time, or (3) All of the time.

Partnership Age Difference

Age difference between young women and her male sexual partner(s) was measured through a series of questions. First, the age of the young woman was established by asking, "How old are you?" Responses were coded as (1) less than 18 years, (2) 18 years, (3) 19 years, and (4) 20 years or more. Participants were ineligible to participate in the study if they were not 18- or 19-years-old. This variable was recoded to directly indicate age as (18) 18 years and (19) 19 years. Next, the age of each male sexual partner was measured through two questions. The first asked, "Is [partner] 18 years or older?" Responses were coded as (0) No or (1) Yes. For partners who were 18 years or older, it was asked, "About how old is [partner] now?" Participants filled in the age in years of the partner. These two questions were combined with partners under 18 years being coded as 17 years.

Finally, the difference in ages was calculated by subtracting participant age from partner age.

Sexual Abuse and Sexual Assault (Forced or Coerced)

History of sexual abuse was measured by asking, "Has a parent or other adult caregiver ever touched you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?" Responses were coded as (0) No or (1) Yes. Forced sexual activity was measured by asking, "Have you ever been physically forced to have any type of sexual activity against your will? For example, through the use of hitting (with or without an object), pushing, shaking, burning, or by using physical restraints. Do not include any experiences with a parent or adult caregiver." Responses were coded as (0) No or (1) Yes. Coerced sexual activity was measured by asking, "Have you ever been forced, in a non-physical way, to have any type of sexual activity against your will? For example, through verbal pressure, threats of harm or by being given alcohol or drugs? Do not include any experiences with a parent or adult caregiver." Responses were coded as (0) No or (1) Yes. History of sexual abuse, forced sexual experience, and coerced sexual experience were all measured in this way in wave four of the Add Health survey and were developed by the Carolina Population Center (n.d.-b) through wide consultation with experts on specific health outcomes and with representatives of the National Institutes of Health.

Lifetime Sexual Partners

Number of sexual partners was measured by asking, "How many partners have you **ever** had vaginal sex with?" Respondents recorded the total number of sexual partners.

Pregnancy Expectations

Pregnancy expectations were measured using the Positive Orientation to Early Motherhood (POEM) scale (Afable-Munsuz et al., 2006). Each of the 8 measures (career, friends, adult, education, trouble, partner, family, and responsible) were measured on a scale of 1–5, indicating the extent of agreement with the statement. A summary score was created with a scale from 8 to 40. The scale was then centered by subtracting 8 so that the scale ranged from 0 to 32 and 0 was a meaningful value.

Family Support

Family support was measured with the Scale of Perceived Social Support (Zimet et al., 1988, 1990), with a mean score calculated from the four family measures, possible scores range from 1 to 7. The scale was then centered by subtracting 1 so that the scale ranged from 0 to 6 and 0 was a meaningful value.

Depression

Depressive symptoms were measured using ten questions from the Center for Epidemiological Studies of Depression Scale (CES-D) (Radloff, 1991). Participants were asked, "How often have you felt this way during the past week: 1) I felt depressed, 2) I felt that everything I did was an effort, 3) My sleep was restless, 4) I was happy, 5) I felt lonely, 6), People were unfriendly, 7) I enjoyed life, 8) I felt sad, 9) I felt that people disliked me, and 10) I could not get "going." Responses were coded as (0) Rarely or none of the time (less than 1 day), (1) Some of the time (1–2 days), (2) Occasionally or a moderate amount of the time (3–4 days), or (3) Most or all of the time (5–7 days). The questions about being happy and enjoying life were reverse coded. A total depression score was created by summing the 10 items, for a

total possible scale of 0 to 30. This was then recoded as a binary variable where scores of under 8 were coded as (0) No depressive symptoms and scores of 8 or greater were recoded as (1) Depressive symptoms. The full 20-item CES-D typically has a range of 0 to 60 and is reported using a cutoff of 16 or above; however, this survey used only 10 items of the CES-D so a cutoff score of 8 was used (Radloff, 1991).

Number of Children

Number of children was measured with two questions. Participants were first asked, "To the best of your knowledge, have you **ever** been pregnant, even if no child was born?" Responses were coded as (0) No or (1) Yes. If they answered yes, they were then asked, "How many live births have you had, meaning the birth of a living child?" Respondents filled in the number of live births. These variables were combined so that participants who had never been pregnant were coded as (0) and participants who had been pregnant were coded as their number of live births.

Education Level

Education level was measured with two questions. Participants were first asked, "What grade are you in?" Responses were coded as (1) 10th, (2) 11th, (3) 12th, (4) In college or university, (5) In technical school, or (6) Not currently in school. Participants who were not in high school were then asked, "What is the highest degree you have received?" Responses were coded as (1) GED, (2) High school diploma, (3) Associate's degree, or (4) None of the above. These two variables were then combined and coded as (0) Not in high school and haven't received a degree, (1) Currently in high school, (2) GED, (3) High school diploma, or (4) Associate's degree.

Employment

Employment was measured with two questions. Participants were first asked, "Do you have a job?" Responses were coded as (0) No or (1) Yes. If they answered yes, they were then asked, "How many hours per week do you work?" Respondents entered the number of hours. These two variables were combined so that participants who did not have a job were coded as (0) and participants with a job were coded as the number of hours they work per week.

Health Insurance

Health insurance was measured by asking, "What kind of health insurance or health care coverage do you currently have?" Responses were coded as (0) none or don't know, (1) Medicaid, (2) Medicare, (3) Military health care, (4) Private insurance, and (5) Other.

Confounding Variable

Participant Age

Although all participating young women were 18- or 19-years-old, this is a crucial life stage when many developmental changes are occurring as young people often leave home for the first time. Due to this critical development, participants' age was included as a confounder. As described previously, the age of the young woman was established by asking, "How old are you?" Responses were coded as (1) less than 18 years, (2) 18 years, (3) 19 years, and (4) 20 years or more. Participants were ineligible to participate in the study if they were not 18- or 19-years-old. This variable was recoded as (0) 18 years and (1) 19 years.

Analytic Methods

To avoid confounding by the study or control intervention, baseline data were used to analyze the prevalence and correlates of psychological aggression by

male intimate partners of participating late adolescent African American young women. Only participants reporting at least one male sexual partner in the previous three months (n=408) were included in analysis. The total number of partnerships that were analyzed is 537. The mean number of partners reported by each participant is 1.7, 23% of sexually active young women reported more than one male sexual partner in the three months before the baseline survey. See **Table 1.1** for the frequency of number of partners for young women in the analysis sample.

Table 1.1. Frequency of number of partners among African American young women.

Number of Partners	Frequency of Young women	Percent of Young women
1	315	77.2%
2	66	16.2%
3	19	4.7%
4	3	0.7%
5	3	0.7%
6	2	0.5%

Given the correlated nature of the partnerships reported by each participant, a two-level generalized linear mixed model (GLMM) was used to identify correlates of psychological aggression (Hoffman, 2013). Level one of the multilevel model was the reported sexual partners, who are nested within individual participants, who were level 2. The outcome variable is a count variable with a limited range. Therefore, negative binomial distribution with a log link function was used to transform the outcome to a continuous, unbounded outcome that was predicted by the generalized linear mixed model (Hedeker, n.d.; Hoffman, 2015). Preliminary analysis included fitting a null model using adaptive quadrature to get a sense of the level of dependence in the data (see **Equation 1.1**). Data were analyzed using SAS®

University Edition, which uses SAS Studio 3.71 and runs on SAS 9.4M5 (SAS, n.d.-b, n.d.-c).

The variance of the random intercepts ($\hat{\tau}_{00}$) is estimated to be 0.4 and the estimate of the fixed effect of the intercept ($\hat{\gamma}_{00}$) is 1.4. The estimated dispersion parameter $(\hat{\theta})$ is 3.5. The likelihood ratio test suggests the random intercept term is necessary for this model. The intraclass correlation (see **Equation 1.2**) was calculated using the variance of negative binomial distribution (Nakagawa et al., 2017). This intraclass correlation implies that if psychological aggression victimization had been measured on a continuous scale, then 37% of the variance in levels of psychological aggression victimization would be accounted for by individual differences between African American young women. **Appendix C** describes the process used to build the final statistical model. See **Equation 1.3** for the generalized linear mixed model. Missing data are assumed to be missing at random, and therefore ignorable when using likelihood inference (Wu, 2010).

Equation 1.1. Null model

Response Distribution: $PsyAgg_{ij}|\mu_{ij} \sim NB(\mu_{ij}, \theta)$

Linear Correlates: $\eta_{ij} = \beta_{0j}$

$\beta_{0j} = \gamma_{00} + \mu_{0j} \qquad \mu_{0j} \sim N(0, \tau_{00})$

Link Function: $\eta_{ij} = log(\mu_{ij})$

Equation 1.2. Intraclass correlation

$$ICC^* = \frac{\tau_{00}}{\tau_{00} + \frac{1}{1 + \frac{1}{e^{\gamma_{00}}} + \frac{1}{\theta}}} = \frac{0.4}{0.4 + 0.6} = 0.37$$

Maximum likelihood estimation with adaptive quadrature was used to fit the model and odds ratios were used to interpret results (SAS, n.d.-a). Multivariable regression analysis was used to assess interaction between covariates. Conventional power and sample size methodology does not take into account the combined impact of random model effects and non-normality (Stroup, 2011). Due to this limitation of conventional power size calculations, the approximate power of the regression of each predictor in the model was calculated by defining the critical F-value. If the observed F-value exceeds this number, we reject $H_0: \tau_i = \tau_{i'}$. Then the probability under the non-central F-value defined by the model was determined and the power was calculated.

Equation 1.3. Generalized linear mixed model examining correlates of psychological aggression victimization by male sexual partners among African American young women in New Orleans

Response Distribution: $PsyAgg_{ij}|\mu_{ij} \sim NB(\mu_{ij}, \theta)$

Link Function: $\eta_{ij} = log(\mu_{ij})$

Reduced-Form:

$$\eta_{ij}$$

$$= \gamma_{00} + \gamma_{10}SteadyPart_{ij} + \gamma_{20}SubSex_{ij} + \gamma_{30}AgeDif_{ij} + \gamma_{01}SexAb_j$$

$$+ \gamma_{02}ForSex_j + \gamma_{03}CoerSex_j + \gamma_{04}VagPart_j + \gamma_{05}POEM0_j + \gamma_{06}PSSFam_j$$

$$+ \gamma_{07}CESD2_j + \gamma_{08}Births_j + \gamma_{09}LevEd_j + \gamma_{010}EmpHr_j + \gamma_{011}InsTyp_j$$

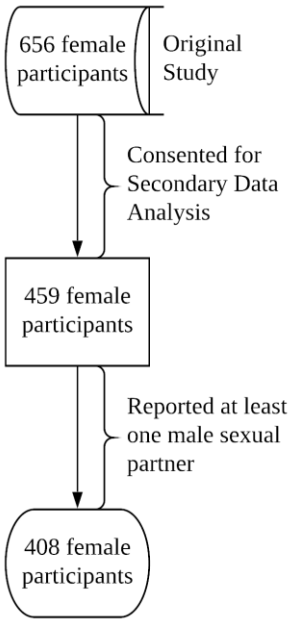
$$+ \gamma_{012}Age_j + \mu_{0j}$$

RESULTS

PARTICIPANT CHARACTERISTICS

Between-partner differences in psychological aggression were examined in 537 male sexual partners of 408 African American young women age 18 or 19 (M=18.5, SD=0.5). See **Figure 1.2** for description of analytic sample. The sample consisted of male partners ages 17 to 40 (M=20.3, SD=2.7). Partners were primarily African American (97%). See **Table 1.2** for demographic characteristics of study participants and their male sexual partners, as reported by female participants. Psychological aggression victimization is not normally distributed in the analysis sample, the mean psychological aggression victimization score is 4.6 (SD=10.11, range from 0 to 77). This indicates that on average participants experienced approximately five psychological aggression tactics from a male sexual partner in the previous three months.

Figure 1.2. Flow chart depicting total and analytic samples



Most participants (70%) were in steady relationships with their reported male sexual partners. The majority (74%) of participants reported never using drugs or alcohol before sexual activity with their male partners, while 23% reported sometimes using and 3% reported always using substances before sexual activity. On average, male sexual partners were 1.7 years older than participating young women (SD=2.59, range from 2 years younger to 22 years older). A history of sexual abuse was reported by 9% of participants. Forced sexual activity was also reported by 9% of participants, while 14% reported coerced sexual activity. The mean number of lifetime sexual partners was 5.7 (SD=6.3, range from 1 to 50). The mean Positive Orientation to Early Motherhood score was 8.8 (SD=7.87, range from 0 to 30), higher scores indicate higher desire/expectation for pregnancy. The average family support score was 5.1 (SD=1.7, scores range from 0 to 6), higher scores indicate higher perceived family support. Depressive symptoms were reported by 8% of participants. The mean number of live births reported by participants was 0.1 (SD=0.3, range from 0 to 2). The majority (89%) of participants had a high school diploma, 9% were high school students, 1% dropped out of high school, 1% had a GED, and 1% had an associate's degree. The mean number of hours worked per week was 9.4 (SD=13.3, range from 0 to 64). Similar numbers of participants had private insurance (28%) and Medicaid (27%), while 14% had Medicare, 2% had military health care, 15% had other insurance, and 13% had no known health insurance.

Bivariate analysis showed no significant differences between those who have experienced psychological aggression and those who have not for the following

predictors: partner age difference, sexual abuse, forced sexual activity, coerced sexual activity, lifetime sexual partners, pregnancy expectations, family support, live births, level of education, employment status, and health insurance. There was a significant difference in substance use before sexual activity ($\chi^2 = 6.6, p = 0.0362$), partnership type ($\chi^2 = 37.7, p < 0.0001$), and depressive symptoms ($\chi^2 = 6.3, p = 0.0119$) between those who have experienced psychological aggression and those who have not. See **Table 1.3** for the univariate and bivariate results.

Table 1.2. Demographic characteristics of study participants and their reported male sexual partners

Demographic	***Frequency***
Male Sexual Partners	
Age (N=537)	
Under 18	31 (5.8%)
18 – 20	334 (62.2%)
21 – 25	147 (27.4%)
26 – 30	21 (3.9%)
31 – 40	4 (0.7%)
Race (N=528)	
African American	510 (96.6%)
White	11 (2.08%)
Asian/Pacific Islander	4 (0.8%)
Native American	3 (0.6%)
Young Women	
18 years old (N=529)	275 (52.0%)

Table 1.3. Univariate and bivariate frequencies of potential correlates of psychological aggression by male intimate partners among African American young women (N=536)

Predictor	***Frequency***		
	Total	**Among those who have not experienced psychological aggression (N=258)**	**Among those who have experienced psychological aggression (N=278)**
Partner-level Correlates			
*Steady Partnership Type***	374 (70.0%)	146 (57.2%)	227 (81.6%)
*Substance Use before Sexual Activity**	137 (25.6%)	53 (20.6%)	84 (30.2%)
Partner 4 Years Older or More	83 (15.8%)	44 (17.0%)	39 (14.0%)
Individual-level Correlates			
Sexual Abuse	48 (9.0%)	24 (9.3%)	24 (8.6%)
Forced Sexual Activity	48 (9.0%)	23 (9.0%)	25 (9.0%)
Coerced Sexual Activity	76 (14.2%)	33 (12.8%)	43 (15.5%)
6 or more Sexual Partners	154 (28.7%)	80 (31.0%)	74 (26.6%)
Desire to Conceive	168 (31.3%)	76 (29.5%)	92 (33.1%)
Low Family Support	340 (63.4%)	166 (63.3%)	174 (62.6%)
*Depressive Symptoms**	41 (7.7%)	12 (4.7%)	29 (10.5%)
Given Birth to a Child	28 (5.2%)	9 (3.5%)	19 (6.8%)
High School Student	47 (8.8%)	19 (7.4%)	28 (10.1%)
Work less than 20 hours/week	393 (73.1%)	190 (73.6%)	202 (72.7%)
No Known Health Insurance	67 (12.6%)	35 (13.7%)	32 (11.6%)

*Statistically significant, $p<0.05$
** Statistically significant, $p<0.0001$

FINDINGS

Equation 1.3 provides the final model, the results of which are summarized in **Table 1.4**. The intercept ($\gamma_{00} = 0.77$) is the expected psychological aggression victimization score for a young woman in the referent group of all variables of interest. The estimated main effect of substance use before sexual activity ($\gamma_{20} = 0.24$), history of sexual abuse ($\gamma_{01} = 0.34$), forced sexual activity ($\gamma_{02} = -0.48$), coerced sexual activity ($\gamma_{03} = 0.48$), lifetime sexual partners ($\gamma_{04} = -0.01$), pregnancy expectations ($\gamma_{05} = 0.01$), family support ($\gamma_{06} = -0.11$), number of live births ($\gamma_{08} = -0.32$), level of education ($\gamma_{09} = -0.03$), hours worked per week ($\gamma_{010} = 0.004$), health insurance ($\gamma_{011} = 0.02$), and young woman's age ($\gamma_{012} = -0.33$) did not indicate that psychological aggression victimization score would be significantly changed by any of these variables.

There were significant relationships between psychological aggression victimization by a male sexual partner and type of partnership ($\gamma_{10} = 1.18, p < 0.0001$) and depressive symptoms ($\gamma_{07} = 0.74, p = 0.0004$). There is also a marginally significant relationship between psychological aggression victimization and age difference between young women and their male sexual partners ($\gamma_{30} = -0.07, p = 0.0460$). For young women in a steady relationship, the likelihood of psychological aggression victimization increases by a factor of 3.26 (CI=2.03–5.22, power=99.8%). For young women who experience depressive symptoms, the likelihood of psychological aggression victimization increases by a factor of 2.10 (CI=1.39–3.17, power=94.3%).

Table 1.4. Results of the generalized linear mixed model for association with psychological aggression victimization by male sexual partners among African American young women (N=537 partnerships).

Model Term	Predictor	Regression Coefficient	Standard Error	Probability	Odds Ratio	95% Confidence Interval	Power %
γ_{00}	Intercept	0.774	0.597	0.1960	2.168	0.67 – 7.02	--
γ_{10}	Steady Partnership Type**	1.180	0.238	<0.0001	3.256	2.03 – 5.22	99.84
γ_{20}	Substance Use	0.241	0.193	0.2137	1.273	0.87 – 1.86	23.64
γ_{30}	Age Difference	-0.074	0.037	0.0460	0.928	0.86 – 1.00	51.63
γ_{01}	Childhood Sexual Abuse	0.341	0.388	0.3793	1.407	0.66 – 3.01	14.19
γ_{02}	Forced Sexual Activity	-0.477	0.502	0.3422	0.620	0.23 – 1.66	15.77
γ_{03}	Coerced Sexual Activity	0.481	0.403	0.2335	1.617	0.73 – 3.57	22.15
γ_{04}	Lifetime Sexual Partners	-0.014	0.021	0.4949	0.986	0.95 – 1.02	10.47
γ_{05}	Desire to Conceive	-0.006	0.014	0.6643	0.994	0.97 – 1.03	7.18
γ_{06}	Family Support	-0.107	0.058	0.0641	0.898	0.80 – 1.01	45.72
γ_{07}	Depressive Symptoms*	0.742	0.209	0.0004	2.100	1.39 – 3.17	94.33
γ_{08}	Births	-0.316	0.411	0.4430	0.729	0.32 – 1.64	11.94
γ_{09}	Level of Education	-0.030	0.161	0.8509	0.970	0.71 – 1.33	5.40
γ_{010}	Hours Worked per Week	0.004	0.008	0.6287	1.004	0.99 – 1.02	7.71
γ_{011}	Health Insurance	0.016	0.064	0.8070	1.016	0.90 – 1.15	5.68
γ_{012}	Age	-0.327	0.209	0.1189	0.721	0.48 – 1.09	34.44

*Statistically significant, p<.05.
** Statistically significant, p<0.0001

DISCUSSION

The current study expands the existing body of research on correlates of psychological aggression victimization by male sexual partners among late adolescent African American young women. Psychological aggression victimization was reported at least once in just over half (52%) of all sexual partnerships. This is considerably higher than the prevalence of psychological aggression reported in other studies (Halpern et al., 2001; Sorgi et al., 2016). Although there is limited data on psychological aggression in this precise population (18- and 19-year-old African American young women in an urban Southern city), there is evidence that high school students in this Southern state experience physical IPV—including being hit, slammed into something, or injured with an object or weapon on purpose by someone they were dating—at a significantly higher rate (15%) than their peers nationwide (10%) (CDC, n.d.). The current study indicates that IPV may be more prevalent in this state among late adolescents as well as among high school students. This finding highlights the severity of psychological aggression among late adolescent African American women in the urban South and indicates the need for intervention to improve the health and well-being of the young women and men in these violent relationships.

Consistent with the hypothesis and TGP, having a steady male sexual partner was associated with increases in psychological aggression victimization. Although casual sexual relationships have been found to have a negative impact on the psychological well-being of adolescent young women, they may provide a protective

factor against IPV victimization by male sexual partners (Bersamin et al., 2014; Dubé et al., 2017; Johnson et al., 2015). Steady partnerships may provide more opportunities for psychological aggression to occur than casual partnerships where the young woman and her partner spend less time together. This is consistent with previous research that showed increased controlling (a subtype of psychological IPV) and physical IPV as relationship duration increased (Vivolo-Kantor et al., 2016). Further efforts are needed to more fully understand the contrasting risk and protective aspects of steady sexual relationships among late adolescent young women.

Also consistent with the hypothesis, TGP, and existing research, having a history of depression was associated with increases in psychological aggression victimization. Mental illness—particularly depression, suicidality, and PTSD—is among the most frequently cited correlates of IPV victimization (Amar & Gennaro, 2005; Hathaway et al., 2000; Stein & Kennedy, 2001). In the current study, experiencing depressive symptoms more frequently in the past week is associated with experiencing more psychological aggression tactics from a male sexual partner. Given the cross-sectional nature of this study, it is particularly difficult to identify directionality in the relationship between psychological aggression victimization and depressive symptoms. Previous research has found that IPV victimization leads to depression, as opposed to depression being a predictor of IPV (Ahmadabadi et al., 2020; Stein & Kennedy, 2001). A systematic review of the literature by Devries and colleagues (2013) found evidence of an association between IPV victimization and

incident depressive symptoms, but also of the reverse association between experiencing depressive symptoms and incident IPV (Ackard et al., 2007; Jonsson et al., 2011; Levendosky et al., 2011; Lindhorst & Oxford, 2008; Loxton et al., 2006; Nduna et al., 2010; Newcomb et al., 2009; Newcomb & Carmona, 2004; Rich et al., 2005; Roberts et al., 2003; M. Salazar et al., 2009; Taft & Watson, 2008; Zlotnick et al., 2006). Further research is needed to determine the causal pathway between depression and IPV victimization.

Contrary to the hypothesis, TGP, and previous research, there was no association found between psychological aggression victimization and the remaining potential correlates. This provides essential insight into the factors most important for interventions to address psychological aggression victimization among late adolescent African American young women. Prior research and TGP supported an association between IPV and history of both childhood sexual abuse and forced sexual activity, although this association was not detectable in the current study (Barrick et al., 2013; Smith et al., 2003; Wingood & DiClemente, 2002).

Several prior studies have found correlation between substance use and IPV victimization (Caetano et al., 2000; DuRant et al., 2007; Silverman et al., 2001). Although Lipsky and colleagues (2005), found that when other factors were controlled, alcohol use was not significantly associated with IPV victimization. Prior research has also found IPV victimization and both lifetime number of sexual partners and number of children, although these associations were not seen in the current study (Acevedo et al., 2013).

Although having an older partner, desire to conceive, family support, coerced sexual activity, lack of education, employment, and health insurance are exposures described by TGP, the public health model of TGP was primarily developed to describe HIV risk, so it is possible that these exposures are not as relevant to psychological aggression, despite the gendered power dynamics involved in IPV (Kelly, 2011; Wingood & DiClemente, 2002). Research has shown that as young men age, they are less likely to perpetrate IPV. In this case an older partner would be protective against psychological aggression victimization, contrary to the assumption of TGP (Johnson et al., 2014).

LIMITATIONS

The CTS2 used to measure psychological aggression in this study does not reflect the current comprehensive definition of psychological aggression, which includes expressive aggression, coercive control, threats, reproductive coercion, exploitation of vulnerability, and gaslighting (Breiding et al., 2015). The CTS2 measures included in this study assessed expressive aggression (e.g., name-calling, humiliating, degrading, acting angry in a way that seems dangerous) and threats of physical violence (Breiding et al., 2015; Straus et al., 1996).

Inherent to the nature of the secondary analysis of existing data, the available data were not collected to address the particular research question or to test the hypothesis of the current study (H. G. Cheng & Phillips, 2014). This study included comprehensive potential correlates; however, it is possible that some important variables were not available for the analysis (H. G. Cheng & Phillips, 2014). Given the

cross-sectional nature of this study, it is not possible to determine causation and longitudinal studies are needed, particularly to examine the relationship between mental health and IPV. Given the large number of potential correlates included in the generalized linear mixed model, some effects may have been confounded by other variables in the model. The low prevalence of several potential correlates, while positive in the sense that many young women have not experienced negative exposures such as sexual abuse and sexual assault, may have made it difficult to statistically determine associations with psychological aggression victimization. The public health model of TGP was primarily developed to describe HIV risk, and more research is needed to determine theoretical applications to other sexual health topics.

IMPLICATIONS FOR PRACTICE

Although the CTS2 is frequently used for assessing psychological aggression, current definitions have been expanded to include factors not measured by CTS2. An expanded scale may more accurately capture all aspects or psychological aggression. Further research is needed to investigate appropriate measurement tools for psychological aggression.

These findings suggest the importance of educating late adolescents about healthy relationship skills. Traditional IPV interventions focus on providing services and treatment for victims after they experience IPV, although there is a growing movement toward healthy relationship education for preventing IPV (Antle et al., 2011). Healthy relationship education is implemented through variety of program

models. (Clinton-Sherrod et al., 2016a). For adolescents, education is typically offered as school-based programs at middle and high schools (Clinton-Sherrod et al., 2016b). The current study indicates the importance of effective healthy relationship education for adolescent men and women and the continued need for healthy relationship education among 18- and 19-year-old African American young women and their male partners, who are not frequently served by typical education programs. IPV interventions are particularly important for young women and men who are in steady partnerships.

For adults, healthy relationship education is typically offered as couples counseling. Couples counseling is most common when couples are entering marriage (Halford, 2004). Marriage is uncommon among this age group, only one participating young woman was married. This indicates a need to expand traditional couples counseling and/or school-based relationship education programs to be relevant to late adolescents. Interventions should be developed that focus on the unique developmental stage of late adolescents and that are culturally appropriate for African American youth. The developmental stage of youth in late adolescence is a crucial time for sexual health interventions. Becoming a sexually healthy adult is a developmental task of late adolescence and youth are transitioning to adult roles in relationships, school, and work (Tulloch & Kaufman, 2013).

These results also suggest that young women with depressive symptoms should be targeted to identify psychological aggression in relationships and for healthy relationship skill-building. Depressive symptoms and psychological

aggression victimization may be comorbid conditions that should be screened for together to identify young women who may be experiencing IPV. There are many valid and reliable IPV screening tools developed for and tested in clinical settings (Paterno & Draughon, 2016). Clinicians should ensure that the screening tool they use includes psychological aggression, as many of them focus on physical violence (Ramaswamy et al., 2019).

Young women who are identified as victims of psychological aggression (with or without comorbid depression) should be asked if they want help, offered assistance and options for help, and encouraged to create a safety plan (Paterno & Draughon, 2016). A safety plan is a personalized, practical plan that can help young women avoid dangerous situations and know the best way to react when in danger (National Domestic Violence Hotline, 2017). The National Domestic Violence Hotline (2017) offers an interactive safety planning tool as well as customized safety plans for high school and college students through the *Loveisrespect* youth-focused website. Clinicians should refer young women who are experiencing psychological aggression to local IPV resources. Clinicians should have a screening protocol in place that includes a plan for immediate response and referrals when a young woman discloses psychological aggression victimization (Paterno & Draughon, 2016). Young women with comorbid depression should also be referred to a licensed mental health professional and their mental health treatment should include individualized relationship education.

CONCLUSION

Psychological aggression victimization is common among 18- and 19-year old African American young women and their male sexual partners. Interventions are needed to build healthy relationship skills among young men and women. These interventions should be evidence-informed and tailored to the unique needs of African American late adolescents. Age- and culturally-appropriate couples counseling should be available to those who are in long-term partnerships, even if they are not considering marriage. Depressive symptoms and psychological aggression victimization may be comorbid conditions and should be screened for together to identify young women at need for mental health services and relationship skill-building.

VII. PAPER 2: THE RELATIONSHIP BETWEEN PSYCHOLOGICAL AGGRESSION VICTIMIZATION BY A MALE SEXUAL PARTNER AND CONSISTENT CONTRACEPTION AND CONDOM USE AMONG AFRICAN AMERICAN LATE ADOLESCENT WOMEN IN THE URBAN SOUTH

ABSTRACT

The majority of births among adolescents are unintended and often occur when contraception is used inconsistently. Although there is a recognized association between IPV and decreased condom and contraception use, the majority of prior studies looked at physical violence or sexual coercion, while there is less research on other forms of IPV, such as psychological aggression. Study participants were surveyed as part of an online pregnancy prevention intervention evaluation. All participants were African American women ages 18–19 living in a Southern city. The Theory of Gender and Power was applied to examine the relationship between psychological aggression by male intimate partners and inconsistent contraception and condom use. Data were collected at baseline and 6-month follow-up among 321 women with 553 male partners using established measures. Generalized estimating equations were used to examine sexual partnerships. Participants reported consistent contraception use in 54% of partnerships and consistent condom use in 58%. There was not a significant relationship between consistent contraception use and psychological aggression, although there was a significant relationship between consistent condom use and experiencing psychological aggression 2 or more times from a male sexual partner. There were significant relationships between

inconsistent contraception use for young women who sometimes used alcohol or drugs before sexual activity and who experienced depression. There was a significant relationship between inconsistent condom use and number of sexual partners. Psychological aggression is not only a substantial public health problem alone, but is associated with other sexual health consequences, such as inconsistent condom use. These findings suggest the importance of including healthy relationship skill-building and substance use prevention in sexual health interventions for late adolescents. Late adolescent women who have experienced psychological aggression victimization should be provided with condom use skill-building and sexually active late adolescent women experiencing depression should be provided with contraception counseling.

INTRODUCTION

BACKGROUND & STUDY AIM

Intimate partner violence (IPV) includes physical violence, sexual violence, stalking, and psychological aggression by a current or former spouse, dating partner, or ongoing sexual partner (Breiding et al., 2015). In 2015, a panel convened by the Centers for Disease Control and Prevention (CDC) updated the definition of IPV to include stalking and expanded the definition of psychological aggression (formerly referred to by a number of different names, i.e., psychological abuse, verbal aggression, emotional violence, etc.) to the "use of verbal and non-verbal communication with the intent to: a) harm another person mentally or emotionally, and/or b) exert control over another person" (Breiding et al., 2015, p. 15). The majority of research on IPV focuses on physical or sexual IPV, there is limited

research available on psychological aggression among late adolescents (Capaldi et al., 2012). Research suggests that young women (ages 18 to 29) are at higher risk of overall IPV victimization than any other age group and that IPV reaches its peak during late adolescence and young adulthood (Abramsky et al., 2011; Barrick et al., 2013; Johnson et al., 2014). Research also indicates that women of color experience IPV at higher rates than white women (Barrick et al., 2013; Capaldi et al., 2012).

According to the 2013 Youth Risk Behavior Survey (the most recent year for which this state included IPV), high school students in this Southern state experience physical IPV at a significantly higher rate (15%) than their peers nationwide (10%) (CDC, n.d.). One study found psychological aggression victimization among 64% of female students attending Historically Black Colleges and Universities (Barrick et al., 2013). The National Longitudinal Study of Adolescent Health (Add Health) Wave IV (2008) found that 21% of young adults (ages 24 to 32) experienced psychological aggression (Sorgi et al., 2016). Previous data from this cohort, Add Health Wave II (1996), found that 29% of female adolescents ages 12 to 21 experienced psychological aggression in opposite-sex romantic relationships (Halpern et al., 2001).

Among a rural sample of adolescents, psychological aggression victimization predicted increased alcohol and marijuana use and increased symptoms of depression and anxiety among young women (Foshee et al., 2013). Adolescents who have experienced physical or sexual IPV are more likely to exhibit a wide variety of unhealthy sexual behaviors, attitudes, beliefs, and norms than their peers who have

not experienced dating violence (Silverman et al., 2011; Wingood et al., 2001). These include having multiple sexual partners, using condoms inconsistently, fear of negotiating condom use, fear of talking with their partner about pregnancy prevention, having a higher perceived risk of acquiring a sexually transmitted infection (STI), perceiving less control over their sexuality, having peer norms that are not supportive of using condoms, and having norms that are not supportive of having a healthy relationship (Silverman et al., 2011; Wingood et al., 2001). Adolescents and young adults with a history of physical and sexual IPV were also more likely to have a sexually transmitted infection than those who had not experienced IPV (Hess et al., 2012; Wingood et al., 2001). Less is known about the impacts of psychological aggression on sexual risk behaviors of late adolescents.

Research has found that adolescent and young adult women who are victims of IPV are more likely to become pregnant than non-victimized young women (O'Donnell et al., 2009; Roberts et al., 2005). The vast majority of teen births are unintended in the United States and half of unintended pregnancies occur among women who use contraception inconsistently or incorrectly (Logan et al., 2007; Manlove et al., 2004; Owusu-Edusei et al., 2013). Births resulting from unintended pregnancies are associated with adverse maternal and child health outcomes, such as delayed prenatal care, premature birth, and negative physical and mental health effects for children (Guttmacher Institute, 2016). Compared to women with planned pregnancies, mothers with unintended pregnancies were more likely to smoke during and after pregnancy and to report postpartum depression (D. Cheng et al.,

2009). Mothers with unintended pregnancies were also less likely to consume recommended amounts of preconception folic acid, to initiate prenatal care during the first trimester, and to breastfeed for eight or more weeks (D. Cheng et al., 2009). Unintended pregnancy rates are highest among young women and women of color (Finer & Zolna, 2016; Guttmacher Institute, 2019). Traditional estimates of unintended pregnancy understate the risk of among adolescents because estimates typically include all women, regardless of whether they are sexually active (Guttmacher Institute, 2019). When rates are recalculated including only those who are sexually active, women aged 15–19 have the highest unintended pregnancy rate of any age-group (Guttmacher Institute, 2019). Inconsistent contraception use is associated with ambivalence about avoiding pregnancy, having less than a college education, being African American, having infrequent sexual intercourse, not being in a current relationship, being dissatisfied with one's contraceptive method, and not discussing contraception with one's partner (Clarke et al., 2016; Frost et al., 2007).

Women experiencing IPV both prior to and during pregnancy are at risk for multiple poor maternal and infant health outcomes (Chisholm et al., 2017; Silverman et al., 2001). Previous research has found a positive association between IPV and decreased condom and contraceptive use (Bogart et al., 2005; Fair & Vanyur, 2011; Gielen et al., 2002; Hess et al., 2012; Kusunoki et al., 2018; Manlove et al., 2004; Mittal et al., 2011, 2012; Tucker et al., 2004; Williams et al., 2008). The majority of prior studies examining the relationship between IPV and contraception

use looked at physical or sexual violence, although psychological aggression has been associated with female adolescents using condoms inconsistently (Roberts et al., 2005). Most previous studies were cross-sectional, limiting the ability to determine causality between psychological aggression and contraception use (Bergmann & Stockman, 2015; Dardis et al., 2014).

The goal of this study is to identify the relationship between psychological aggression perpetrated by a male sexual partner and consistent contraception and/or condom use in a longitudinal sample of 18- and 19-year-old African American young women in a Southern urban city using secondary data from a teen pregnancy prevention program evaluation conducted by Kissinger and colleagues (2015). Psychological aggression victimization has significant health impacts for young women, as does inconsistent use of contraception and condoms. It is essential to understand the intersection between these important public health issues. Psychological aggression victimization and inconsistent contraception use have significant health impacts for young women. This study contributes to and extends the existing body of knowledge on late adolescent African American young women's experiences of psychological aggression victimization by male partners and contraception use; in particular it aims to assess if a prospective relationship can be demonstrated between the two.

CONCEPTUAL MODEL

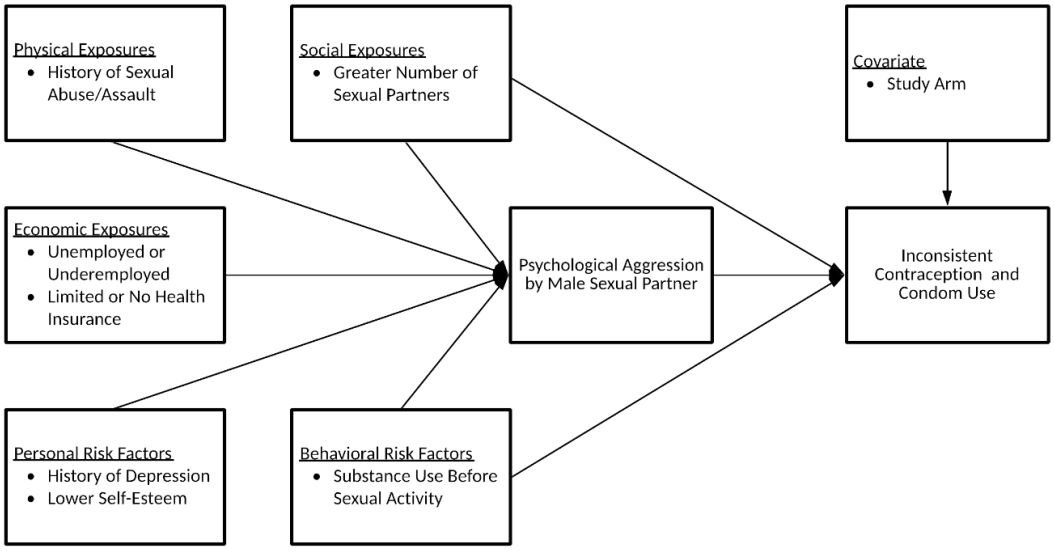
The current study used the Theory of Gender and Power as a theoretical framework to guide the selection of potential predictors of inconsistent

contraception use. The Theory of Gender and Power (TGP) proposes and defines three structures that characterize the gendered relationships between women and men as 1) the sexual division of labor, 2) the sexual division of power, and 3) cathexis, which examines the structure of affective attachments and social norms (Connell, 1987; Wingood & DiClemente, 2002). Wingood and DiClemente (2002) adapted TGP for use in HIV prevention, expanding the original three structures of TGP into six theoretical constructs. The sexual division of labor can be thought of as creating economic exposures and socioeconomic risk factors, while the sexual division of power results in physical exposures and behavioral risk factors (Wingood & DiClemente, 2002). The structure of affective attachments and social norms (cathexis) produces social exposures and personal risk factors (Wingood & DiClemente, 2002). Key exposures and risk factors relevant to contraception use among young women are family support, self-esteem, history of sexual assault, and contraceptive self-efficacy (DePadilla et al., 2011; Wingood & DiClemente, 2002).

The hypothesized model for applying TGP to the relationship between psychological aggression victimization and contraception and condom use is described in **Figure 2.1**. Some of the young women in the study participated in an internet-delivered pregnancy prevention intervention that was designed to increase consistent contraception use among sexually active participants and may confound the current study (Kissinger et al., 2015). Given the potential of confounding by the intervention, study arm has been controlled for in analysis. Control variables were identified based on the previously described literature and identified TGP exposures

and risk factors. Predictors are grouped by the construct they represent in TGP: physical exposures, behavioral risk factors, social exposures, and personal risk factors. Socioeconomic risk factors were not included in the conceptual model given the homogeneity of the study population, who were all 18-19-year-old African American young women. TGP constructs interact to cause an adverse impact on women's health (Wingood & DiClemente, 2002). Therefore, the hypothesis is that experiencing psychological aggression from a male sexual partner will reduce consistent contraception and/or condom use in sexual partnerships.

Figure 2.1 Conceptual model based on the Theory of Gender and Power for the relationship between psychological aggression victimization by a male sexual partner and consistent contraception and condom use among 18- and 19-year old African American young women



METHODS

MEASURES

Consistent Contraception Use

The first dependent variable for this study is consistent contraceptive use, which was measured by asking participants for each of their male sexual partners: "In the past 3 months, have you had vaginal sex with [partner] without you or him using a method of birth control?" Responses were coded as (0) No or (1) Yes. See Appendix B for the survey instrument.

Consistent Condom Use

The second dependent variable for this study is consistent condom use, which was measured by asking participants for each of their male sexual partners: "In the past 3 months, have you ever had vaginal sex without you or [partner] using a condom?" Responses were coded as (0) No or (1) Yes.

Psychological Aggression

The independent variable for this study is female victimization of violence by a male intimate partner. Psychological aggression victimization was measured with seven items from the Revised Conflict Tactics Scale (CTS2; Straus, 1979; Straus et al., 1996). Participants were asked, "in the past three months how many times has [partner] done any of the following? 1) he has insulted or swore at you; 2) he shouted or yelled at you; 3) he stomped out of the room/house/yard during a disagreement; 4) he said something to make you angry or hurt; 5) he destroyed something belonging to you; 6) he accused you of being no good in bed; 7) he threatened to hit or throw something at you." Following the established scoring scale for CTS2, responses for each item were coded into categories according to the

number of times each aggression tactic had occurred: (0) this has never happened or it has happened before, but not in the past 3 months; (1) once; (2) twice; (4) 3–5 times; (8) 6–10 times; (15) 11–20 times; and (25) more than 20 times (Straus et al., 1996). A total score of psychological aggression was created by summing all seven items, for a total possible scale of 0 to 175. The psychological aggression victimization score was then categorized into quartiles by calculating the median (1), lower quartile (0), and upper quartile (4) and recoding as (0) None, (1) One, (2) 2 – 4 tactics, or (3) 5 or more tactics.

Study Arm

An important covariate for this study is participation in the intervention group of the original study. Study staff recorded the random assignment of each participant into the two study arms. Participants were coded as (0) Control or (1) Intervention.

Confounding Variables

Potential confounders were identified as substance use before sexual activity, history of sexual abuse, forced sexual activity, coerced sexual activity, number of sexual partners, depressive symptoms, and self-esteem. To facilitate interpretation of the intercept and main effects, each predictor was centered such that 0 was a meaningful value (Hoffman, 2015).

Substance Use

Substance use before sexual activity was measured by asking, "In the past three months, how often did you drink or use drugs before having sex with [partner]?" Responses were categorized as (0) Never, (1) Some of the time, or (3) All of the time.

Sexual Abuse and Sexual Assault (Forced or Coerced)

History of sexual abuse was measured by asking, "Has a parent or other adult caregiver ever touched you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?" Responses were coded as (0) No or (1) Yes. Forced sexual activity was measured by asking, "Have you ever been physically forced to have any type of sexual activity against your will? For example, through the use of hitting (with or without an object), pushing, shaking, burning, or by using physical restraints. Do not include any experiences with a parent or adult caregiver." Responses were coded as (0) No or (1) Yes. Coerced sexual activity was measured by asking, "Have you ever been forced, in a non-physical way, to have any type of sexual activity against your will? For example, through verbal pressure, threats of harm or by being given alcohol or drugs? Do not include any experiences with a parent or adult caregiver." Responses were coded as (0) No or (1) Yes. History of sexual abuse, forced sexual experience, and coerced sexual experience were all measured in this way in wave four of the Add Health survey and were developed by the Carolina Population Center (n.d.-b) through wide consultation with experts on specific health outcomes and with representatives of the National Institutes of Health.

Lifetime Sexual Partners

Number of sexual partners was measured by asking, "How many partners have you **ever** had vaginal sex with?" Respondents recorded the total number of sexual partners.

Depression

The survey included 10 items from the 20-item Center for Epidemiological Studies of Depression (CES-D) Scale (Radloff, 1991). Depressive symptoms were measured using a subset of four questions from the CES-D . This subset represents a DSM-III-like category of clinically meaningful dysphoric mood symptoms (Radloff, 1991). Participants were asked, "How often have you felt this way during the past week: 1) I felt depressed, 2) I was happy, 3) I enjoyed life, and 4) I felt sad. Responses were coded as (0) Rarely or none of the time (less than 1 day), (1) Some of the time (1–2 days), (2) Occasionally or a moderate amount of the time (3–4 days), or (3) Most or all of the time (5–7 days). The questions about being happy and enjoying life were reverse coded. According to the Third Edition of The Diagnostic and Statistical Manual of Mental Disorders (DSM-III, the edition of the DSM that was current at the time the scale was developed), participants were considered to have experienced dysphoric mood symptoms if they scored 3 on any of these questions (American Psychiatric Association, 1980; Radloff, 1991). Responses were recoded to create a binary variable for each question with responses 0, 1, and 2 recoded as (0) and responses of 3 recoded as (1). The four questions were then added together to create a scale from 0 to 4 and then recoded to create a binary variable where scores of 0 remained coded as (0) No depressive symptoms and scores of 1 or greater were recoded as (1) Depressive symptoms. (Radloff, 1991)

Self-Esteem

Self-esteem was measured with the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). Respondents rate each item using a 4-point Likert scale: (0) strongly disagree, (1) Disagree, (2) Agree, and (3) Strongly Agree. Half of the items (five) are positively coded and the other half (five) are reverse coded. Each item is then added together to create a composite score with a possible range from 0 to 30.

Analytic Methods

Participants who consented to secondary data analysis and reported at least one male partner throughout the study were included in analysis. Respondents reported on up to five male sexual partners in the prior three months at each time point: baseline, 3 months, 6 months, and 12 months. Data were analyzed from baseline and 6-month follow-up due to substantial missing data at 3- and 12-months. Data were analyzed using Stata/SE 16.0.

Analyses conducted for the original study found that there were no differences between participants who had all data compared to those who had missing data based on examining several characteristics, although it is possible that they differ based on unobserved data (Kissinger et al., 2015). This indicates the data were missing at random, and therefore not of concern when using likelihood inference and standard longitudinal data software allowing for unbalanced data can be used (Ibrahim & Molenberghs, 2009; Wu, 2010).

Given the correlated nature of the partnerships reported by each participant at each time point, generalized estimating equations (GEE) were used to identify the relationship between psychological aggression victimization by a male partner and

consistent contraception and condom use. The outcome variables are dichotomous (inconsistent versus consistent contraception/condom use) so a negative binomial link function was used to transform the outcome. See **Appendix D** for preliminary analysis and model building.

The first GEE analyzed consistent contraception use associated with psychological aggression victimization, study arm, substance use before sexual activity, history of sexual abuse, forced sexual activity, coerced sexual activity, number of sexual partners, depressive symptoms, and self-esteem. The second GEE examined consistent condom use associated with psychological aggression victimization and each previously listed variable.

RESULTS

PARTICIPANT CHARACTERISTICS

Participants were surveyed and responded to a series of questions for up to five male sexual partners from the previous three months. If a participant had more than five partners in the previous three months, she chose which five to report on in detail. The mean number of partners reported at each time point is 1.9. See **Table 2.1** for the frequency of number of partners for young women in the sample. Individual partners of the same participant could be different at each occasion of measurement.

Between-partner differences in contraception use were examined among 553 male sexual partners of 321 African American young women ages 18 or 19 (M=18.4, SE=0.3) at two time points (baseline and 6 months). The sample consisted of male partners ages 17 to 40 (M=20.3, SE=0.1). Partners were primarily African

American (97%). See **Table 2.2** for demographic characteristics of study participants and their male sexual partners. The measure of consistent contraception and condom use have binary distributions, with 46% of participants reporting inconsistent contraception use and 42% reporting inconsistent condom use with their male sexual partner(s). See **Table 2.3** for frequencies for the potential correlates, covariates, and controls for the study. The mean psychological aggression victimization score is 4.2 (SE=0.5, range from 0 to 68). This indicates that on average participants experienced approximately four psychological aggression tactics from a male sexual partner in the previous three months across time points.

Slightly fewer participants in the secondary analysis sample were enrolled in the intervention arm (48%) than the control arm (52%) of the original study. The majority (76%) of participants reported never using drugs or alcohol before sexual activity with their male partners, while 21% reported sometimes using and 3% reported always using substances before sexual activity. A history of sexual abuse was reported by 7% of participants. Forced sexual activity was also reported by 7% of participants, while 21% reported coerced sexual activity. The mean number of lifetime sexual partners was 5.1 (SE=0.3, range from 1 to 50). Depressive symptoms were reported by 16% of participants. The mean self-esteem score was 23.1 (SE=0.3, uncentered scores range from 0 to 30).

Table 2.1. Frequency of sexual partnerships reported by heterosexual African American 18- and 19-year-old women in the prior three months at baseline and 6-month follow-up.

Number of Partners	Baseline N=536	6 months N=554
1	232 (63.7%)	254 (60.9%)
2	82 (22.5%)	67 (16.1%)
3	36 (9.9%)	54 (13.0%)
4	4 (1.1%)	20 (4.8%)
5	4 (1.1%)	6 (1.4%)
6	6 (1.6%)	7 (1.7%)
7	0	4 (1.0%)
8	0	1 (0.2%)
10 or more	0	4 (1.0%)

Table 2.2. Demographic characteristics of study participants and their reported male sexual partners at baseline measurement.

Demographic	***Baseline Frequency***	
	N	***%***
Male Sexual Partners		
Age (N=425)		
Under 18	17	3.8
18 – 20	262	59.4
21 – 25	143	32.4
26 – 30	15	3.4
31 – 40	4	0.9
Race (N=437)		
African American	424	97.0
White	7	1.6
Asian/Pacific Islander	4	0.9
Native American	2	0.5
Young Women (N=364)		
18 years old	208	57.1
19 years old	156	42.9

Table 2.3. Frequency of psychological aggression victimization by a male sexual partner among African American young women and covariates

Variables	*Baseline Frequency*
Partner-level Independent Variable	
Any Psychological Aggression Victimization (N=362)	190 (52.5%)
Partner hurt feelings (N=400)	182 (45.5%)
Partner shouted (N=393)	141 (35.9%)
Partner stomped out (N=378)	97 (25.7%)
Partner insulted (N=373)	43 (11.5%)
Partner threatened physical violence (N=368)	22 (6.0%)
Partner destroyed belongings (N=365)	9 (2.5%)
Partner said not good in bed (N=365)	6 (1.6%)
Partner-level Covariate	
Any Substance Use before Sexual Activity (N=578)	140 (24.2%)
Individual-level Covariates	
Intervention Study Arm (N=364)	173 (47.5%)
Childhood Sexual Abuse (N=363)	25 (6.9%)
Forced Sexual Activity (N=426)	30 (7.0%)
Coerced Sexual Activity (N=426)	90 (21.1%)
6 or more Sexual Partners (N=348)	91 (26.1%)
Depressive Symptoms (N=838)	73 (8.7%)
Low Self-esteem (Score<23; N=789)	347 (44.0%)

FINDINGS

Estimated effects of correlates of consistent contraception use are summarized in **Table 2.4**. The intercept (z=1.62) is the expected consistent contraception use log odds for a young woman who has never experienced psychological aggression from her male sexual partner and holding all else constant. The estimated main effects of psychological aggression victimization involving one tactic (z=0.83), two to four tactics (z=0.44), or 5 or more tactics (z=-0.27) in a partnership did not indicate that consistent contraception use would be significantly changed by psychological aggression victimization.

There was a significant relationship between consistent contraception use and young women who sometimes used alcohol or drugs before sexual activity (z=-2.09, p=0.04); there was not a significant relationship for young women who always used substances before sex. For young women who sometimes uses alcohol or drugs before sexual activity, the likelihood of consistently using contraception decreases by a factor of 0.51 (CI=0.27 – 0.96) compared to young women who never use substances before sexual activity. There was also a significant relationship between experiencing depressive symptoms (z=-2.17, p=0.03) and inconsistent contraception use. For young women who experience depressive symptoms, the likelihood of using contraception consistently decreases by a factor of 0.36 (CI=0.14 – 0.90) compared to young women who do not experience depressive symptoms.

Estimated effects of correlates of consistent condom use are summarized in **Table 2.5**. The intercept (z=-1.90) is the expected consistent condom use log odds for a young woman who has experienced no psychological aggression tactics from her male sexual partner and holding all else constant. The estimated main effects of psychological aggression victimization involving one tactic (z=-1.511) in a partnership did not indicate that consistent condom use would be significantly changed by a single episode of psychological aggression victimization. There was a significant relationship, however, between consistent condom use and psychological aggression victimization involving two to four tactics (z= -2.79, p=0.005) and five or more tactics (z=-4.00, p<0.0001) in a partnership. There was also a marginally

significant relationship between lifetime number of sexual partners (z=0.43, p=0.046) and inconsistent condom use.

A young woman is 0.37 times less likely (CI=0.18 – 0.74) to use condoms consistently with a partner who has used two to four psychological aggression tactics than a young woman whose partner has never used psychological aggression tactics. A young woman is 0.23 times less likely (CI=0.11 – 0.48) to use condoms consistently with a partner who has used five or more psychological aggression tactics than a young woman whose partner has never used psychological aggression tactics.

Table 2.4. Estimated effects of correlates of consistent contraception use

Predictor	Regression Coefficient (z)	Standard Error	Probability	Odds Ratio	95% Confidence Interval
Intercept	1.62	2.478	0.105	3.337	0.78 – 14.30
Psychological aggression victimization					
1 tactic	0.83	0.712	0.408	1.486	0.58– 3.80
2 – 4 tactics	0.44	0.407	0.658	1.167	0.59 – 2.31
5 or more tactics	0.27	0.369	0.789	1.094	0.57 – 2.12
Intervention arm	-0.01	0.263	0.991	0.997	0.59– 1.67
Substance use before sexual activity					
*Some of the time**	-2.09	0.164	0.037	0.511	0.27 – 0.96
All of the time	0.75	2.669	0.455	2.342	0.25 – 21.85
History of sexual abuse	1.46	2.033	0.143	2.846	0.70 – 11.54
History of forced sexual activity	-1.23	0.290	0.220	0.468	0.14 – 1.57
History of coerced sexual activity	0.09	0.593	0.926	1.053	1.35 – 3.17
Lifetime number of sexual partners	0.43	0.029	0.668	1.012	0.96 – 1.07
Depressive Symptoms*	-2.17	0.169	0.030	0.356	0.14 – 0.90
Self-esteem score	-0.50	0.028	0.617	0.986	0.93 – 1.04

*Statistically significant, p<.05

Table 2.5. Estimated effects of correlates of consistent condom use

Predictor	Regression Coefficient (z)	Standard Error	Probability	Odds Ratio	95% Confidence Interval
Intercept	1.90	3.792	0.058	4.666	0.95 – 22.95
Psychological aggression victimization					
1 tactic	-1.51	0.235	0.130	0.466	0.17 – 1.25
*2 – 4 tactics***	-2.79	0.132	0.005	0.369	0.18 – 0.74
*5 or more tactics****	-4.00	0.085	0.000	0.233	0.11 – 0.48
Intervention Arm	-0.22	0.264	0.823	0.939	0.54– 1.63
Substance use before sexual activity					
*Some of the time**	-1.56	0.203	0.120	0.580	0.29 – 1.15
All of the time	-0.69	0.502	0.489	0.496	0.07 – 3.61
History of sexual abuse	1.92	4.515	0.055	5.232	0.96 – 28.40
History of forced sexual activity	-0.81	0.414	0.420	0.538	0.12 – 2.43
History of coerced sexual activity	-0.35	0.520	0.724	0.793	0.22 – 2.87
Lifetime number of sexual partners*	1.99	0.043	0.046	1.083	1.00 – 1.17
Depressive Symptoms	-1.72	0.214	0.086	0.394	0.14 –1.14
Self-esteem score	-0.83	0.030	0.408	0.975	0.92 – 1.04

*Statistically significant, p<0.05
**Statistically significant, p<0.01
****Statistically significant, p<.0001

DISCUSSION

The current study expands the body of research on the correlation between psychological aggression victimization and consistent contraception and condom use among late adolescent African American women. Consistent contraception use with a male sexual partner was reported among 54% of participants. This is slightly lower than previous research has indicated. Add Health Wave II found that among adolescents ages 12 to 21, 58% reported consistent contraception use in their most recent relationship (Manlove et al., 2004). The lower prevalence of consistent contraception use in the current study as compared to the Add Health data are unexpected as there has been a general upward trend in the use of hormonal contraception in the United States (Lindberg et al., 2018). Late adolescents, however, are more likely to report using condoms than hormonal methods of contraception (Hayes et al., 2009; Welti et al., 2011). This held true in the current study, where consistent condom use was reported among 58% of participants.

Consistent with the hypothesis, experiencing psychological aggression victimization more than once in the prior three months from a male sexual partner was associated with decreases in consistent condom use, although there was no association between consistent condom use and a single episode of psychological aggression victimization in the prior three months. Previous research has found a positive association between IPV and decreased condom use, although many prior studies of IPV and condom use looked at physical violence or sexual coercion (Bogart et al., 2005; Fair & Vanyur, 2011; Gielen et al., 2002; Hess et al., 2012; Mittal et al., 2011, 2012; Roberts et al., 2005; Tucker et al., 2004). This study adds to the

literature by examining the association between psychological aggression victimization by a male sexual partner and consistent condom use among late adolescent African American women in the urban South.

Contrary to the hypothesis, there was no association found between inconsistent contraception use and psychological aggression victimization. Previous research has found a positive association between IPV and decreased contraception use, however, the majority of prior studies of IPV and contraception use looked at physical violence (Kusunoki et al., 2018; Manlove et al., 2004; Williams et al., 2008). It is possible that psychological aggression has less of an impact on contraception use than physical IPV. The current study only assessed expressive aggression and threats of physical violence; further research is needed to look at a more comprehensive picture of psychological aggression and consistent contraception use. For example, reproductive coercion is a crucial type of psychological aggression that was not assessed in the current study. Reproductive coercion includes control or attempts to control reproductive health or decision-making by an intimate partner (e.g., not allowing the use of contraception, refusing to use a condom, coerced pregnancy termination, etc.) (Breiding et al., 2015). A previous study by Sutherland and colleagues (2015) found that 8% of female college students reported experiencing reproductive coercion, and 57% of those also experienced other forms of IPV. The most common type of reproductive coercion among this sample of female college students was being told not to use any contraception (Sutherland et al., 2015).

It is possible that psychological aggression victimization by a male sexual partner has more impact on African American late adolescent women's consistent use of condoms is because psychological aggression victimization makes it more difficult for young women to negotiate condom use. Previous research has shown an association between physical and sexual IPV and fear of requesting that a male partner uses a condom, receiving negative responses from male partners when requested to use a condom, and having been coerced into not using a condom during sex (Silverman et al., 2011; Wingood et al., 2001). Unlike condoms, other methods of contraception are primarily the responsibility of the woman alone and do not require negotiation with one's partner. It could be that psychological aggression victimization increases the fear of negotiating condom use with a male sexual partner, thus decreasing consistent usage. Contraception methods that do not require negotiating with a male sexual partner may not be influenced by psychological aggression victimization for this reason.

Occasional use of alcohol or drugs before sexual activity was found to decrease the likelihood of using contraception consistently, although always using alcohol or drugs before sexual activity did not have a significant effect. This contradicts previous research that found that higher frequency of drinking alcohol before sexual activity predicted lower probability of dual contraception use (Bailey et al., 2012). It is possible that young women who always use alcohol or drugs before sex have a better plan for using contraception in these situations than young women who only sometimes engage in this behavior. Having a history of depressive

symptoms was associated with decreases in consistent contraception use. This is consistent with previous research (Stidham Hall et al., 2013).

The public health model of TGP has primarily focused on describing HIV risk, so it is possible that the covariates identified by TGP are not as relevant to consistent contraception use more broadly and the prevention of unintended pregnancy (DePadilla et al., 2011; Wingood & DiClemente, 2002). Although Rosenbaum and colleagues (2016) found associations between all three TGP structures and unprotected sex, and between two TGP structures (Division of Labor and Cathexis) and unintended pregnancy. It is also possible that TGP is not as relevant among African American late adolescent women, where the intersection of racial discrimination may affect their reproductive health (Price, 2011). Young women not only experience the effects of gender in their lives but are also affected by their race and other aspects of their identities (Crenshaw, 1991; Price, 2011). Gender and race do not operate separately from one another but work together to shape the experiences of African American young women.

LIMITATIONS

The measure of inconsistent contraception asked participants for each male sexual partner: "In the past 3 months, have you had vaginal sex with [partner] without you or him using a method of birth control?" Although this was asked immediately after a question that listed different ways to prevent pregnancy (condoms, birth control pills, the shot, the patch, the ring, IUDs, and implants), there was no clear definition of "method of birth control" in the question about consistency so it could have been interpreted differently by participants. It is

possible that participants included less effective traditional methods of contraception, such as withdrawal, in their consideration of this question.

The CTS2 used to measure psychological aggression in this study does not reflect the current comprehensive definition of psychological aggression, which includes expressive aggression, coercive control, threats, reproductive coercion, exploitation of vulnerability, and gaslighting (Breiding et al., 2015). The CTS2 measures included in this study assessed expressive aggression (e.g., name-calling, humiliating, degrading, acting angry in a way that seems dangerous) and threats of physical violence (Breiding et al., 2015; Straus et al., 1996). The current study explains the effects of expressive aggression, but more research is needed to understand the current conceptualization of psychological aggression.

Inherent to the nature of the secondary analysis of existing data, the available data were not collected to address the particular research question or to test the hypothesis of the current study (H. G. Cheng & Phillips, 2014). This study included comprehensive potential correlates, however it is possible that some important variables were not available for the analysis (H. G. Cheng & Phillips, 2014). The public health model of TGP was primarily developed to describe HIV risk, and more research is needed to determine theoretical applications to other sexual health topics.

IMPLICATIONS FOR PRACTICE

These findings suggest the importance of preventing psychological aggression for increasing condom use among late adolescents. Psychological aggression victimization by a male sexual partner occurred more than once in 43%

of reported partnerships. This indicates that a large percentage of African American late adolescent young women are experiencing psychological aggression in their relationships and are at risk for inconsistent condom use among the other negative impacts of IPV. Traditional IPV interventions focus on providing services and treatment for victims after they experience IPV, although there is a growing movement toward healthy relationship education for preventing IPV (Antle et al., 2011). Healthy relationship education is implemented through variety of program models, which serve either adult or youth populations and involve either individual- or couples-based services (Clinton-Sherrod et al., 2016a). Education is typically offered as school-based programs for middle and high school students or as individuals or couples counseling for adults (Clinton-Sherrod et al., 2016b). The current study indicates the continued need for healthy relationship education and sexual communication skill-building among 18- and 19-year-old African American young women and especially their male partners, who are not frequently served by typical education programs. Interventions should be developed that focus on the unique developmental stage of late adolescents and that are culturally appropriate for African American youth.

These findings also suggest the importance of integrating psychological aggression and substance use prevention into sexual health interventions for adolescents. Traditionally, sexual health programs in the United States have focused on secondary education, which is certainly necessary to prevent unintended pregnancy, psychological aggression, and substance use before young people reach late adolescence. However, the results of the current study indicate that further

intervention may be necessary for late adolescents. Many of the characteristics of effective sexual health programs can easily be adapted to develop developmentally appropriate programs for late adolescents who have graduated from high school (Kirby, 2007; Suellentrop, 2011). There are several evidence-based interventions that could be adapted for late adolescents. Teen Talk is typically offered at schools in collaboration with nearby health centers and is delivered in six 2-hour discussion-based educational sessions (Eisen et al., 1992). The majority of participants in the current study (91%) were enrolled in a 2- or 4-year college or university, indicating that this intervention could be adapted to the college setting. FOCUS is a small-group community-based intervention delivered in four 2-hour educational sessions (Boyer et al., 2005). Project MARS is a small-group community-based intervention for that successfully incorporated alcohol and drug prevention into a single 2-hour session based on motivational interviewing (Bryan et al., 2018). Interventions should be developed and adapted to focus on the unique developmental stage of late adolescence and that are culturally appropriate for African American youth.

An overview of systematic reviews of interventions for adolescent substance abuse by Das and colleagues (2016) found that school-based interventions, particularly those based on a combination of social competence and social influence approaches, are associated with reduced frequency of alcohol and drug use and that family-based interventions have an effect on alcohol misuse among adolescents. Alcohol misuse is a common problem among college and university students, and programs exist on many campuses to address this issue. The National Institute of Alcohol Abuse and Alcoholism (2019) has developed the College Alcohol

Intervention Matrix (*CollegeAIM*) to help colleges and universities identify effective alcohol abuse prevention interventions. Interventions include individual-level strategies designed to change student's knowledge, attitudes, and behaviors related to alcohol and environmental-level strategies designed to change the campus and community environments in which student drinking occurs and to educate the student body as a whole.

These findings also suggest the importance of educating late adolescents who have experienced psychological aggression victimization about condom use skills. Integrating evidence-based sexual health interventions into existing services for late adolescents who are victims of psychological aggression will provide them with the comprehensive services they need. The Safer Sex Intervention (SSI) has been shown to increase consistent condom use among female adolescents (ages 14 – 19) in the same Southern city as the current study (Jenner et al., 2015). SSI involves four one-on-one sessions between the young woman and a female health educator and uses motivational interviewing to assess participants' personal sense of risk and provide tailored health messages to help participants adopt and maintain consistent condom use (Shrier et al., 2001). Replication of SSI across the United States has found positive impacts on contraception use and intention to use condoms, especially in youth 18 years or older (Kelsey et al., 2016).

Additionally, these results suggest that young women with depressive symptoms should be screened for inconsistent contraception use and provided with contraception counseling. A review of the literature by Lopez and colleagues (2016) found that the most effective brief intervention to improve consistent contraception

use among adolescents was developmental contraception counseling. Adolescents who received contraception counseling and a follow-up phone consultation used birth control more consistently than adolescents who received counseling alone (Berenson & Rahman, 2012).

CONCLUSION

The current study found that psychological aggression victimization by a male sexual partner decreases the likelihood of African American 18- and 19-year-old young women using condoms consistently but does not have a significant effect on consistent contraception use. The study did find that substance use and depressive symptoms are significantly associated with inconsistent contraception use. To address these issues, it is imperative to prevent psychological aggression victimization by providing healthy relationship skill-building to adolescents, particularly to the young men who perpetrate this aggression. Sexual health interventions are also needed that incorporate substance use prevention. Late adolescent women who have experienced psychological aggression victimization should be provided with condom use skill-building. Sexually active late adolescent women experiencing depression should be screened for inconsistent contraception use and provided with contraception counseling. These comprehensive interventions and wrap-around services will improve the sexual health of late adolescents.

VIII. PAPER 3: PREVALENCE & PREDICTORS OF CONTRACEPTION USE AMONG FEMALE STUDENTS ATTENDING HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

ABSTRACT

There is a small but growing body of literature on the health of African American college students. However, much of the past research has focused on African American students attending traditionally white institutions and therefore may not be generalizable to the unique environment of historically black colleges and universities (HBCUs). HBCUs enroll 25% of college-educated African American young adults and limited research has shown that students attending HBCUs engage in less risky behaviors than white college students, yet experience a heavier burden of sexual consequences, such as unintended pregnancy. The Theory of Gender and Power was applied to examine the prevalence and correlates of inconsistent contraception use among participants attending HBCUs. Participants in the current study were surveyed as part of an online pregnancy prevention intervention evaluation. All participants were African American women ages 18–19 living in a Southern city. Survey data were collected at baseline among 211 women with 275 male partners using established measures. A two-level generalized linear mixed model was used to examine partners nested within women. Inconsistent contraception use was reported in 38% of all partnerships. Of eight hypothesized correlates and interaction terms, there was a significant relationship between the education level of a participant's mother ($p = 0.02$) and inconsistent contraception use with a male sexual partner. For each additional level of mother's education, the likelihood of consistently using contraception increases by a factor of 1.50 (CI=1.05–

2.13). These findings suggest the importance of integrating sexual health information into programs for first-generation college students at HBCUs.

INTRODUCTION

INCONSISTENT CONTRACEPTION USE & UNINTENDED PREGNANCY

Half of unintended pregnancies occur among women who use contraception inconsistently or incorrectly and the majority of pregnancies in the Southern state where the current study takes place are unintended (Kost, 2015; Logan et al., 2007; Manlove et al., 2004; Owusu-Edusei et al., 2013). Unintended pregnancy rates are highest among young women and women of color (Guttmacher Institute, 2019). Traditional estimates of unintended pregnancy understate the risk among adolescents because estimates typically include all women, regardless of whether they are sexually active (Guttmacher Institute, 2019). When rates are recalculated including only those who are sexually active, women aged 15–19 have the highest unintended pregnancy rate of any age group (Guttmacher Institute, 2019). Adolescent mothers are less likely than their peers without children to earn a college degree (Sonfield et al., 2013). Women who do not complete college are likely to be left out of the labor force and a college degree can significantly increase a woman's lifetime earnings (Carnevale et al., n.d.). Births resulting from unintended pregnancies are also associated with adverse maternal and child health outcomes, such as delayed prenatal care, premature birth, postpartum depression, and negative physical and mental health effects for children (D. Cheng et al., 2009; Guttmacher Institute, 2016). Inconsistent contraception use is associated with ambivalence about avoiding pregnancy, having less than a college education, having

infrequent sexual intercourse, not being in a current relationship, and being dissatisfied with one's contraceptive method (Frost et al., 2007).

HISTORICALLY BLACK COLLEGES & UNIVERSITIES

Historically black colleges and universities (HBCUs) are a cornerstone of the African American community and have been the mainstay of educating African Americans at the college and university levels (Bracey, 2017; US Commission on Civil Rights, 2010; Younge et al., 2013). HBCUs differ substantially from traditionally white institutions (TWIs): HBCUs typically have smaller enrollments, a lower student-faculty ratio, and higher student-faculty interactions, characteristics that are positively associated with student development (US Commission on Civil Rights, 2010). However, HBCUs tend to have fewer resources compared to TWIs, such as lower expenditures for each full time equivalent student, lower average faculty salaries, and poorer physical facilities (US Commission on Civil Rights, 2010). Additionally, the family backgrounds of students enrolled in HBCUs are on average less affluent than students attending TWIs (US Commission on Civil Rights, 2010). Nevertheless, graduates of HBCUs are more likely to have felt supported while in college and to be thriving afterward than their African American peers who graduated from TWIs (Gallup & USA Funds, 2015). There is a small but growing body of literature on the health of African American college students, but much of this research has focused on African American students attending TWIs and therefore may not be generalizable to the unique environment of HBCUs (Younge et al., 2013).

HBCUs enroll 25% of college-educated African American young adults, however, they continue to be underrepresented in research studies and there is limited information about sexual risk behaviors among students attending HBCUs (Hayes et al., 2009; Younge et al., 2013). Sexual risk behaviors are common among college-age young women (American College Health Association, 2016; Tulloch & Kaufman, 2013). Although society seems to better recognize the need for health-related programs and services among children and younger adolescents, college students are an important priority population, and higher education is an opportune setting for sexual health promotion (Lederer & Oswalt, 2017). Research has shown that students attending HBCUs engage in less risky behaviors than students at TWIs, yet experience a heavier burden of sexual consequences, such as sexually transmitted infections and unintended pregnancy (Buhi et al., 2010; Younge et al., 2013). Further research is needed to fully understand this paradox.

Despite the ongoing significance of HBCUs, there is limited information about contraceptive use and other health behaviors among students attending HBCUs (Hayes et al., 2009; Sutton et al., 2011). Of the 137 United States postsecondary institutions in the Spring 2016 National College Health Assessment II, only two were HBCUs (American College Health Association, 2016). Research among first-year HBCU students found that relatively few respondents reported hormonal contraceptive use during their last sexual intercourse (Hayes et al., 2009). The most common form of contraception reported at last sexual encounter was condoms (63%), followed by birth control pills (13%), withdrawal (7.1%), Depo-Provera (1.7%), and other (3.2%) (Hayes et al., 2009). Hayes and colleagues compared these

results to data from African American first-year college students surveyed by the American College Health Association and found that more students in the HBCU sample used condoms, but fewer used birth control pills at last intercourse (Hayes et al., 2009). These findings are consistent with research among African American college students at TWIs (Buhi et al., 2010). Condom use is significantly less likely among African American college students whose mothers did not graduate from high school, and more likely for students with higher self-efficacy in negotiating and practicing safer sex with one's partner (Burns & Dillon, 2005; El Bcheraoui et al., 2013).

AIM OF CURRENT STUDY

The aim of the current study is to identify the prevalence and predictors of contraception use among female students attending HBCUs in a Southern city, a traditionally understudied and underserved population (Younge et al., 2013). Previous research has identified a number of predictors of contraceptive use, although none of this research has focused on HBCU students (Acevedo et al., 2013; Barrick et al., 2013; Bergmann & Stockman, 2015; Dardis et al., 2014; Halpern et al., 2009; Johnson et al., 2014; Manlove et al., 2004; O'Donnell et al., 2009; Renner & Whitney, 2012). The current study begins to fill this gap.

CONCEPTUAL MODEL

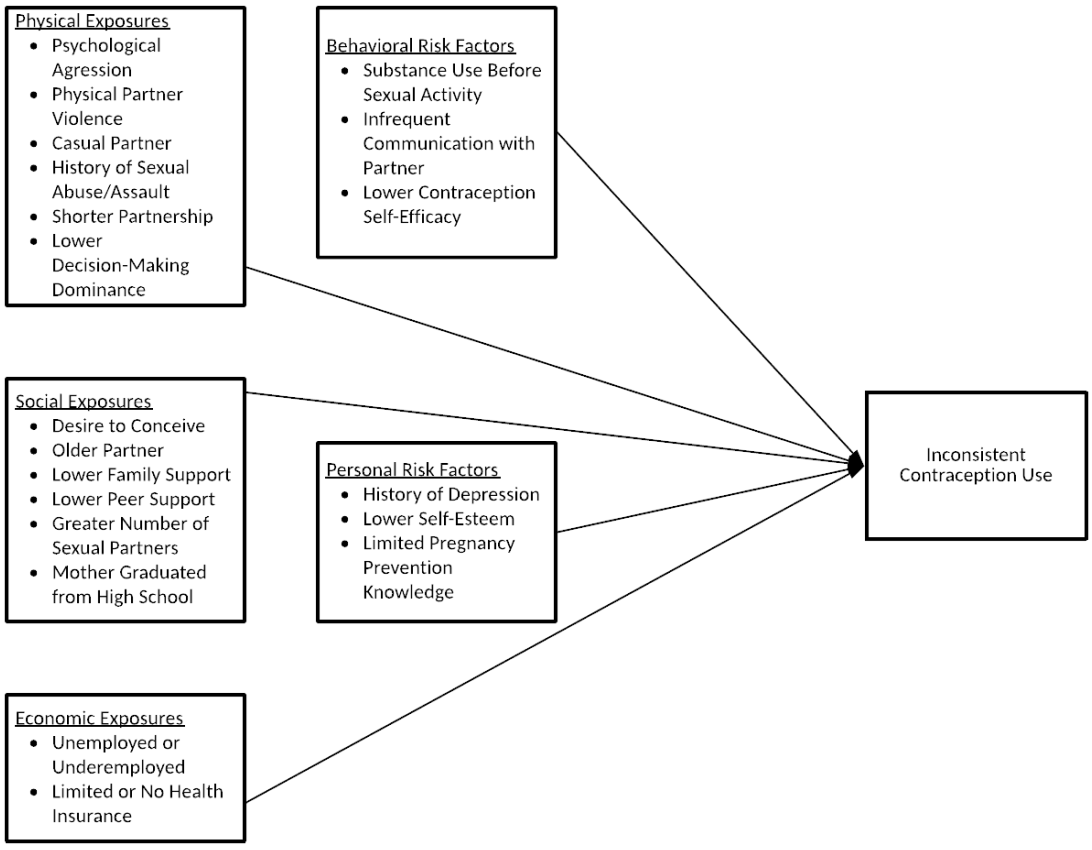
The current study used the Theory of Gender and Power as a theoretical framework to guide the selection of potential predictors of inconsistent contraception use. The Theory of Gender and Power (TGP) proposes and defines three structures that characterize the gendered relationships between women and

men as 1) the sexual division of labor, 2) the sexual division of power, and 3) cathexis, which examines the structure of affective attachments and social norms (Connell, 1987; Wingood & DiClemente, 2002). Wingood and DiClemente (2002) adapted TGP for use in public health, expanding the original three structures of TGP into six theoretical constructs. The sexual division of labor can be thought of as creating economic exposures and socioeconomic risk factors, while the sexual division of power results in physical exposures and behavioral risk factors (Wingood & DiClemente, 2002). The structure of affective attachments and social norms (cathexis) produces social exposures and personal risk factors (Wingood & DiClemente, 2002). Key exposures and risk factors relevant to contraception use among young women are family support, self-esteem, history of sexual assault, and contraceptive self-efficacy (DePadilla et al., 2011; Wingood & DiClemente, 2002).

The hypothesized model for applying TGP to the prevalence and predictors of inconsistent contraception use is described in **Figure 3.1**. Variables were identified as potential predictors based on the previously described literature and identified TGP exposures and risk factors. Predictors are grouped by the construct they represent in TGP: Physical Exposures, Behavioral Risk Factors, Social Exposures, Personal Risk Factors, and Economic Exposures. Socioeconomic Risk Factors (TGP includes race and age in this construct) were not included in the conceptual model given the homogeneity of the study population (all 18- and 19-year-old African American young women). TGP constructs interact to cause an adverse impact on women's health (Wingood & DiClemente, 2002).

Based on TGP and existing literature, the hypothesis for the current study is that potential correlates of inconsistent contraception use will include the following individual level physical exposures: history of forced sexual activity; behavioral risk factors: contraceptive self-efficacy; social exposures: mother's education level and perceived family support; and personal risk factors: self-esteem (Burns & Dillon, 2005; DePadilla et al., 2011; El Bcheraoui et al., 2013; Wingood & DiClemente, 2002). Although there is substantial evidence linking some of these variables to inconsistent contraception use in other populations, this study not only examines these variables among HBCU female students, but also includes exposures and risk factors identified by TGP. While TGP has primarily been used to examine HIV risk for women—including inconsistent condom use— there is reason to expect relevance to unintended pregnancy and inconsistent contraception use more broadly. One study has found associations between all three TGP structures and unprotected sex, and between two TGP structures (Division of Labor and Cathexis) and unintended pregnancy (Rosenbaum et al., 2016).

Figure 3.1. Conceptual model based on the Theory of Gender and Power for the prevalence and predictors of contraception use among 18- and 19-year old African American female students attending historically Black colleges and universities



METHODS

MEASURES

Consistent Contraception Use

The dependent variable for this study is consistent contraceptive use, which was measured by asking participants for each male sexual partner: "In the past 3 months, have you had vaginal sex with [partner] without you or him using a method of birth control?" Responses were coded as (0) No or (1) Yes.

Correlates

The independent variables were identified based on TGP and from existing literature. They include history of forced sexual activity, mother's education level, contraceptive self-efficacy, perceived family support and self-esteem, each of which is described below. To facilitate interpretation of the intercept and main effects, each predictor was centered such that 0 was a meaningful value (Hoffman, 2015).

History of Forced Sexual Activity

Forced sexual activity was measured by asking, "Have you ever been physically forced to have any type of sexual activity against your will? For example, through the use of hitting (with or without an object), pushing, shaking, burning, or by using physical restraints. Do not include any experiences with a parent or adult caregiver." Responses were coded as (0) No or (1) Yes. This question was used in wave four of the Add Health survey (Carolina Population Center, n.d.-a).

Contraception Self-Efficacy

Contraceptive self-efficacy was measured using the 18-item Contraceptive Self-Efficacy Scale (Levinson et al., 1998). Respondents rate each statement on a 5-point Likert scale based on how true the item is for them: (0) Not at all true of me, (1) Slightly true of me, (2) Somewhat true of me, (3) Mostly true of me, and (4) Completely true of me. The statements describe situations that involve obtaining contraceptives: utilizing contraceptives with a partner; talking to a partner about contraceptive use; using contraceptives in spite of partner or parental disapproval; interrupting an episode of highly aroused, unplanned sex to talk about (or to use) a contraceptive; acknowledging to another or to one-self the physical aspects of sexuality; and preventing episodes of unprotected sexual intercourse. Half of the

items (nine) indicate higher contraceptive self-efficacy and the other half (nine) indicate lower self-efficacy. The nine that represent negative (lower) self-efficacy are reverse coded to account for endorsing a negative response. Each item is then added together to create a composite score with a possible range from 0 to 72.

Mother's Education Level

Mother's education level was measured by asking, "What is the highest level of education your mother completed?" Responses were coded as (0) Less than high school diploma, (1) High school diploma or GED, (2) Some college, no degree, (3) Associate's degree, (4) Bachelor's degree, and (5) Graduate degree.

Perceived Family Support

Family support was measured with the Scale of Perceived Social Support, with a mean score calculated from the four family measures, possible scores range from 0 to 6 (Zimet et al., 1988, 1990). The internal reliability of this scale is .87 and the test-retest reliability is .85 (Zimet et al., 1988).

Self-Esteem

Self-esteem was measured with the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). Respondents rate each item using a 4-point Likert scale: (0) strongly disagree, (1) Disagree, (2) Agree, and (3) Strongly Agree. Half of the items (five) are positively coded and the other half (five) are reverse coded. Each item is then added together to create a composite score with a possible range from 0 to 30 (Fetzer Institute, n.d.).

ANALYTIC METHODS

To avoid confounding by the study or control intervention, baseline data were used to analyze the prevalence and correlates of contraception use among

female students attending historically black colleges and universities (HBCUs). This study looks at the subset of "You Geaux Girl!" participants recruited from the three HBCUs in a Southern city who consented to secondary data analysis (n=259). Respondents reported on up to five male sexual partners in the prior three months. Only HBCU students reporting at least one male sexual partner in the three months before baseline (n=211) were included in analysis. The total number of partnerships that were analyzed is 275. The mean number of partners reported by each girl is 1.68 (SD=1.1), only 39% of female HBCU students reported more than one male sexual partner in the three months before the baseline survey. See **Table 3.1** for the frequency of number of partners for young women in the analysis sample.

Table 3.1. Frequency of number of male sexual partners in the previous three months among 18- and 19-year-old female HBCU students (N=275).

Number of Partners	*Frequency of Young women*	*Percent of Young women*
1	167	60.7%
2	58	21.1%
3	33	12.0%
4	8	2.9%
5	4	1.4%
6	5	1.8%

Given the correlated nature of the partnerships reported by each participant, a two-level generalized linear mixed model (GLMM) was used to identify predictors of inconsistent contraception use (Hoffman, 2013). Level one of the multilevel model is the reported sexual partners, who are nested within participants, who are level 2. The outcome variable is dichotomous so a logit link function was used to transform the outcome to a continuous, unbounded outcome that was predicted by

the generalized linear mixed model (Hedeker, n.d.; Hoffman, 2015). Preliminary analysis included fitting a null model using adaptive quadrature to get a sense of the level of dependence in the data (see **Equation 3.1**). Data were analyzed using SAS® University Edition, which uses SAS Studio 3.71 and runs on SAS 9.4M5 (SAS, n.d.-b, n.d.-c). The variance of the random intercepts ($\hat{\tau}_{00}$) is estimated to be 2.61 and the estimate of the fixed effect of the intercept ($\hat{\gamma}_{00}$) is -0.90. The likelihood ratio test suggests the random intercept term is necessary for this model. The intraclass correlation was calculated using the variance of logistic distribution (see **Equation 3.2**). This intraclass correlation implies that if contraception use had been measured on a continuous scale, then 44% of the variance in levels of contraception use would be accounted for by individual differences among female HBCU students.

Equation 3.1. Null model

Response Distribution: $NoMethod_{ij}|\mu_{ij} \sim BER(\mu_{ij})$

Linear Predictors: $\eta_{ij} = \beta_{0j}$

$\beta_{0j} = \gamma_{00} + \mu_{0j} \qquad \mu_{0j} \sim N(0, \tau_{00})$

Link Function: $\eta_{ij} = logit(\mu_{ij})$

Equation 3.2. Intraclass correlation

$$ICC^* = \frac{\tau_{00}}{\tau_{00} + \frac{\pi^2}{3}} = \frac{2.61}{2.61 + 3.29} = 0.4422$$

Bivariate analysis indicated statistically significant relationships between history of forced sex and contraceptive self-efficacy ($\chi^2 = 9.1, p = 0.0026$); history of forced sex and self-esteem ($\chi^2 = 11.5, p = 0.0007$); and mother's education level and perceived family support ($\chi^2 = 12.6, p = 0.0278$). These were included in the final model as interaction terms. A full generalized linear mixed model was analyzed

that included all identified TGP exposures and risk factors as depicted in the conceptual model (see **Figure 3.1**). This model showed significant estimated main effects of mother's education level and was simplified by removing extraneous predictors. The final model consisted of individual-level physical exposures, behavioral risk factors, social exposures, and personal risk factors. **Appendix E** describes in more detail the process used to build the final statistical model. See **Equation 3.3** for the generalized linear mixed model. Preliminary analysis conducted by the original study team shows that there are no differences on selected characteristics for those who had all data compared to those who had any missing data, although it is possible that they differ based on unobserved data (Kissinger et al., 2015). This indicates the data are missing at random, and therefore ignorable when using likelihood inference and standard longitudinal data software allowing for unbalanced data can be used (Ibrahim & Molenberghs, 2009; Wu, 2010).

Equation 3.3. Final generalized linear mixed model examining predictors of contraception use among 18- and 19-year-old female students attending historically black colleges and universities in New Orleans

Response Distribution: $ConsBC_{ij}|\mu_{ij} \sim BER(\mu_{ij})$

Link Function: $\eta_{ij} = logit(\mu_{ij})$

Reduced-Form: $\eta_{ij} = \gamma_{00} + \gamma_{01}ForSex_j + \gamma_{02}CtEff0_j + \gamma_{03}MomEd0_j + \gamma_{04}PSSFam0_j + \gamma_{05}RSE0_j + \gamma_{06}(ForSex_j * CtEff_j) + \gamma_{07}(ForSex_j * RSE0_j) + \gamma_{08}(MomEd0_j * PSSFam0_j) + \mu_{0j}$

Maximum likelihood estimation with adaptive quadrature was used to fit the model and odds ratios were used to interpret results (SAS, n.d.-a). Multivariable regression analysis was used to assess interaction between covariates. Conventional power and sample size methodology does not take into account the combined impact of random model effects and non-normality (Stroup, 2011). Due to this limitation of conventional power size calculations, the approximate power of the regression of each predictor in the model was calculated by defining the critical F-value (F=3.89). If the observed F-value exceeds this number, we reject $H_0: \tau_i = \tau_{i'}$. Then the probability under the non-central F-value defined by the model was determined and the power was calculated.

RESULTS

PARTICIPANT CHARACTERISTICS

Over half of the participants in the "You Geaux Girl!" evaluation were HBCU students, providing a unique opportunity to study predictors of contraception use

among this population. Between-partner differences in contraception use were examined in 275 male sexual partners of 211 female HBCU students ages 18 or 19 (M=18.4, SD=0.5). The sample consisted of male partners ages 17 to 40 (M=20.1, SD=2.5). Partners were primarily African American (97%). See **Table 3.2** for demographic characteristics of study participants and their male sexual partners. The measure of consistent contraception use has a binary distribution, with 38% of female HBCU students reporting inconsistent contraception use with their male sexual partner(s). See **Table 3.3** for the frequency of potential predictors. Forced sexual activity was reported by 11% of participants. The mean Contraceptive Self-Efficacy Scale score was 55.4 (SD=8.4, range from 28 to 72), higher scores equate to higher self-efficacy. Mother's education level varied widely among participants with 7% having than a high school diploma, 21% having a high school diploma or GED, 28% having some college but no degree, 11% having an Associate's degree, 20% having a Bachelor's degree, and 13% having a Graduate degree. The mean perceived family support score was 4.2 (SD=1.8, scores range from 0 to 6). The mean self-esteem score was 23.6 (SD=5.0, scores range from 6 to 30).

Table 3.2. Demographic characteristics of study participants and their reported male sexual partners

Demographic	*Baseline Frequency*
Male Sexual Partners	
Age (N=275)	
Under 18	10 (3.7%)
18	59 (21.6%)
19	73 (26.7%)
20	53 (19.4%)
21 or Older	78 (28.6%)
Race (N=269)	
African American	261 (97.0%)
White	4 (1.5%)
Asian/Pacific Islander	2 (0.7%)
Native American	2 (0.7%)
Young Women	
18 years old (N=272)	155 (57.0%)

Table 3.3. Frequency of potential predictors of inconsistent contraception use among 18- and 19-year old African American female students at historically black colleges and universities

Individual-level Predictors	*Frequency*
Forced sexual activity (N=275)	31 (11.3%)
Low Contraceptive Self-Efficacy (Score <55; N=271)	117 (42.6%)
Mother Less than High School Education (N=270)	18 (6.6%)
Low Family Support (Score<4; N=274)	90 (32.7%)
Low Self-esteem (Score<23; N=273)	117 (42.6%)

FINDINGS

Equation 3.3 provides the final model, the results of which are summarized in **Table 3.4**. The intercept ($\gamma_{00} = -1.98$) is the expected consistent contraception use log odds for a young woman whose mother did not finish high school, who has not experienced forced sexual activity, and who has perceived family support, self-esteem, and contraceptive self-efficacy scores of zero. The estimated main effects of forced sexual activity ($\gamma_{01} = -0.69$), contraceptive self-efficacy ($\gamma_{02} = 0.01$), perceived family support ($\gamma_{04} = 0.21$), self-esteem ($\gamma_{05} = -0.01$), did not indicate

that consistent contraception use would be significantly changed by any of those predictors. The interaction terms also did not indicate correlation with consistent contraception use. The estimated main effect of mother's education ($\gamma_{03} = 0.40, p = 0.02$) indicated that a young woman's consistent contraception use is predicted to be significantly more likely as her mother's education level increases (holding all else constant).

There is a significant relationship between a young woman's mother's education level and consistent contraception use with male sexual partners. For each increase in mother's education level, the likelihood of consistently using contraception increases by a factor of 1.50 (CI=1.05–2.13). The power of this calculation is 61%. See **Table 3.4** for power calculations for the final model.

Table 3.4. Estimated fixed effects of correlates for consistent contraception use

Model Term	Predictor	Estimate	Standard Error	Probability	Odds Ratio Estimate	95% Confidence Interval	Power %
γ_{00}	Intercept	-1.979	0.842	0.020	0.138	0.026 – 0.728	--
γ_{01}	Forced sexual activity	-0.690	2.872	0.810	0.502	0.002 – 145.194	5.657
γ_{02}	Contraceptive self-efficacy, unit=1	0.009	0.011	0.428	1.009	0.987 – 1.031	12.412
γ_{03}	Mother's education level*	0.404	0.179	0.025	1.498	1.052 – 2.133	61.242
γ_{04}	Perceived family support, unit=0.25	0.209	0.111	0.062	1.232	0.989 – 1.536	46.211
γ_{05}	Self-esteem, unit=1	-0.008	0.018	0.658	0.992	0.957 – 1.028	7.259
γ_{06}	Interaction between forced sexual activity and contraceptive self-efficacy	0.067	0.048	0.169	1.069	0.972 – 1.176	27.878
γ_{07}	Interaction between forced sexual activity and self-esteem	-0.150	0.091	0.102	0.861	0.719 – 1.030	37.352
γ_{08}	Interaction between mother's education level and perceived family support	-0.067	0.038	0.087	0.936	0.868 – 1.010	40.238

*Statistically significant, $p<0.05$

DISCUSSION

The current study expands the limited body of research on correlates of contraception use among female students at HBCUs. Inconsistent contraception use with a male sexual partner was reported among 38% of 18- and 19-year-old African American female HBCU students. It is difficult to compare this to previous research with HBCU students as most prior studies asked about contraception use at the most recent sexual encounter, while the current analysis looked at consistent use during the prior three months (Buhi et al., 2010; Hayes et al., 2009). Asking about consistency during a broader time range gives a more complete picture of contraception use than asking about use at a single time point. The current study provides unique insight into the consistency of contraception use among female HBCU students. When looking at contraception use at last sexual encounter, the current study did find differences in type of contraception compared to previous studies of HBCU students. Fewer HBCU students in the current study reported condom use than the study by Hayes and colleagues (2009) (56% vs 63%) and more reported hormonal contraception use (35% vs 15%). It is possible that this difference is due to general trends in increasing hormonal contraception use seen in the United States during this time period (Lindberg et al., 2018). This points to the need for more current and comprehensive research among HBCU students, as these studies looked at a small subset of the 101 HBCUs in the United States.

Consistent with the hypothesis and existing research, there was an association between higher level of education among participants' mothers and

increases in consistent contraception use. El Bcheraoui and colleagues (2013) identified a correlation among HBCU students between condom use and having a mother who graduated from high school. The current study indicates that mother's education level is also correlated with contraception use, providing new insight into protective factors for preventing unintended pregnancy among this population. The significant difference in mother's education level was seen between participants whose mothers have finished high school and those that haven't ($p=0.009$).

Contrary to the hypothesis, TGP, and previous research, there was no association found between inconsistent contraception use and the remaining potential correlates. Prior research and TGP supported an association between contraception use and contraceptive self-efficacy (Burns & Dillon, 2005; DePadilla et al., 2011; Wingood & DiClemente, 2002). On the Contraceptive Self-Efficacy Scale that ranges from 0 to 72, the lowest score among participants in the current study was 28 (and the highest 72), indicating at least a low level of contraceptive self-efficacy in the whole population. This relative level of self-efficacy could be a reason why an association was not evident.

Although perceived family support, self-esteem, and history of forced sexual activity are exposures and risk factors described by TGP, the public health model of TGP has primarily focused on describing HIV risk and condom use, so it is possible that these exposures are not as relevant to contraception use more broadly and the prevention of unintended pregnancy (DePadilla et al., 2011; Wingood & DiClemente, 2002). Although Rosenbaum and colleagues (2016) found associations between all

three TGP structures and unprotected sex, and between two TGP structures (Division of Labor and Cathexis) and unintended pregnancy.

LIMITATIONS

The measure of inconsistent contraception asked participants for each male sexual partner: "In the past 3 months, have you had vaginal sex with [partner] without you or him using a method of birth control?" Although this was asked immediately after a question that listed different ways to prevent pregnancy (condoms, birth control pills, the shot, the patch, the ring, IUDs, and implants), there was no clear definition of "method of birth control" in the question about consistency so it could have been interpreted differently by participants. It is possible that participants included less effective traditional methods of contraception, such as withdrawal, in their consideration of this question.

Inherent to the nature of the secondary analysis of existing data, the available data were not collected to address the particular research question or to test the hypothesis of the current study (H. G. Cheng & Phillips, 2014). Although the conceptual model for this study was very comprehensive, it is possible that some important variables were not available for the analysis (H. G. Cheng & Phillips, 2014). Given the cross-sectional nature of this study, it is not possible to determine causation and longitudinal studies are needed. Given the number of potential correlates and interaction terms included in the generalized linear mixed model, some effects may have been confounded by other variables in the model. The number of participants who experienced a history of forced sexual activity (11%)

may have made it difficult to determine an association with inconsistent contraception use. The public health model of TGP was primarily developed to describe HIV risk and condom use, and more research is needed to determine theoretical applications to other sexual health topics.

IMPLICATIONS FOR RESEARCH AND PRACTICE

A greater effort should be made to include HBCUs in national college health surveys to gain more understanding of the unique health needs of students attending these institutions. Ideally numerous HBCUs with diverse characteristics (e.g., region, size, etc.), would be included rather than a few select campuses.

These findings suggest the importance of educating female HBCU students whose mothers have lower levels of education about contraception and sexual health. First-generation college students represent 45% of students at HBCUs (Espinosa et al., 2018). Programs for first-generation students already exist on many college campuses (Whitley et al., 2018). Integrating evidence-informed sexual health content into these existing programs could provide needed information to first-generation college students at HBCUs. While, traditionally, sexuality education programs in the United States have focused on secondary education, many of the characteristics of effective programs can easily be adapted to develop developmentally appropriate programs for college students (Kirby, 2007; Suellentrop, 2011). Recent research supports the use of brief, tailored, sexual health seminars with college students, and has found that college students may not be interested in human sexuality courses(King et al., 2020; Olmstead et al., 2019).

Research suggests that the use of contraception to postpone pregnancy increases the likelihood of women's college attendance and attainment (Sonfield et al., 2013). Only 33% of college students with children complete a certificate or degree within six years of enrollment (Gault et al., 2014). This indicates the importance of increasing consistent contraception use and preventing unintended pregnancy among college students. The American College Health Association (2012) Standards of Practice for Health Promotion in Higher Education state that the "specific purpose of health promotion in higher education is to support student success" (p. 1). These standards can be used to guide integration of evidence-informed sexual health content into programs for first-generation HBCU students to ensure that best practices are being followed.

Ideally, any programs at HBCUs will be supplementing the sexuality education the young women received in their high schools before arriving at college; however, only 29 states require sex education to be taught in schools (Guttmacher Institute, 2020). This study provides further evidence to support the need for comprehensive sexuality education for adolescents. In addition to school-based sexuality education, this study highlights the important role of mothers in predicting late adolescents' consistent contraception use. This points to the importance of sexual health programs that involve both parents and adolescents. Evidence-based programs exist that are designed to promote effective communication skills, build parent-adolescent relationships, help parents develop successful monitoring strategies, and teach adolescents assertiveness and refusal skills (Guilamo-Ramos et

al., 2011). However, these programs are often aimed at parents of younger adolescents, indicating the need for interventions for parents of older adolescents as well.

CONCLUSIONS

This study found that 62% of female HBCU students reported consistent contraception use with their male sexual partner(s) and that the likelihood of consistent contraception use increased as mother's education increased. These findings support the integration of sexual health content into programs for first-generation college students at HBCUs. Sexual health content should be tailored to the needs and interests of these students and should focus on increasing contraception use and preventing unintended pregnancy, which could not only benefit their health, but also their academic attainment.

IX. DISCUSSION

The current study expands the existing body of research on correlates of psychological aggression victimization by male sexual partners and on the correlation between psychological aggression victimization and consistent contraception and condom use among late adolescent African American women. The current study also expands the limited body of research on correlates of consistent contraception use among female students at HBCUs.

Psychological aggression victimization was reported at least once in just over half (52%) of all sexual partnerships. This is considerably higher than the prevalence of psychological aggression reported in other studies (Halpern et al., 2001; Sorgi et al., 2016). This finding highlights the magnitude of psychological aggression in this population and the need for intervention to improve the health and well-being of the young women and men in these violent relationships.

Consistent contraception use with a male sexual partner was reported among 54% of 18-and 19-year-old African American women in the current study. This is slightly lower than previous research has indicated (Manlove et al., 2004). Late adolescents, however, are more likely to report using condoms than hormonal methods of contraception (Hayes et al., 2009; Welti et al., 2011). This held true in the current study, where consistent condom use was reported among 58% of participants. Consistent contraception use with a male sexual partner was reported among 62% of the subset of participants who attend HBCUs, higher than the rate in the overall sample.

Psychological aggression victimization was associated with having a steady male sexual partner and having a history of depression. There was no association found between psychological aggression victimization and the remaining potential correlates: substance use before sexual activity, age difference of partner, sexual abuse, forced sexual activity, coerced sexual activity, positive orientation toward early motherhood, family support, lifetime sexual partners, level of education, hours worked per week, health insurance, and number of live births. This provides essential insight into the factors most important for interventions to address psychological aggression victimization among late adolescent African American young women.

There was no association found between inconsistent contraception use and psychological aggression victimization. Previous research has found a positive association between IPV and decreased contraception use, however, the majority of prior studies of IPV and contraception use looked at physical violence (Kusunoki et al., 2018; Manlove et al., 2004; Williams et al., 2008). Reproductive coercion is a crucial type of psychological aggression that was not assessed in the current study. Occasional use of alcohol or drugs before sexual activity was found to decrease the likelihood of using contraception consistently, although always using alcohol or drugs before sexual activity did not have a significant effect. It is possible that young women who always use alcohol or drugs before sex have a better plan for using contraception in these situations than young women who only sometimes engage in this behavior. Having a history of depressive symptoms was associated with

decreases in consistent contraception use. Experiencing psychological aggression victimization more than once in the prior three months from a male sexual partner was associated in decreases in consistent condom use, although there was no association between consistent condom use and a single episode of psychological aggression.

Among HBCU students, there was an association between higher level of education among participants' mothers and increases in consistent contraception use. However, there was no association found between inconsistent contraception use and the remaining potential correlates: history of forced sexual activity, contraceptive self-efficacy, mother's education level, perceived family support, and self-esteem. This provides essential insight into the factors most important for interventions to address consistent contraception use among 18- and 19-year-old African American HBCU students.

OVERALL STRENGTHS

Strengths of the study include the ability to analyze local data related to sexual risk behaviors among adolescents in Louisiana and the potential impact for facilitating future development and analyses of interventions based on TGP (DePadilla et al., 2011). The current study is secondary analysis of existing data from the "You Geaux Girl!" randomized control evaluation. The data were readily available from the original research team, several of whom are on my dissertation committee. The dataset was cleaned and merged to ensure accuracy and ease of analysis.

OVERALL LIMITATIONS

Inherent to the nature of the secondary analysis of existing data, the available data were not collected to address the particular research question or to test the hypothesis of the current study (H. G. Cheng & Phillips, 2014). This study included comprehensive potential correlates, however, it is possible that some important variables were not available for the analysis, such as contraceptive use at first sexual encounter, and more comprehensive measures of physical IPV (H. G. Cheng & Phillips, 2014). Given the cross-sectional nature of this study, it is not possible to determine causation and longitudinal analysis is needed. Given the large number of potential correlates included in the models, some effects may have been confounded by other variables in the model. It is also possible that some of the variables may act as mediators. The public health model of TGP was primarily developed to describe HIV risk, and more research is needed to determine theoretical applications to other sexual health topics.

The CTS2 used to measure psychological aggression in this study does not reflect the current comprehensive definition of psychological aggression, which includes expressive aggression, coercive control, threats, reproductive coercion, exploitation of vulnerability, and gaslighting (Breiding et al., 2015). The CTS2 measures included in this study assessed expressive aggression (e.g., name-calling, humiliating, degrading, acting angry in a way that seems dangerous) and threats of physical violence (Breiding et al., 2015; Straus et al., 1996).

The measure of inconsistent contraception asked participants for each male sexual partner: “In the past 3 months, have you had vaginal sex with [partner]

without you or him using a method of birth control?" Although this was asked immediately after a question that listed different ways to prevent pregnancy (condoms, birth control pills, the shot, the patch, the ring, IUDs, and implants), there was no clear definition of "method of birth control" in the question about consistency so it could have been interpreted differently by participants. It is possible that participants included less effective traditional methods of contraception, such as withdrawal, in their consideration of this question.

DISSEMINATION

Potential journals that might be interested in publishing these papers are

- *Journal of Adolescent Health*
- *American Journal of Public Health*
- *Journal of Women's Health*
- *Maternal and Child Health Journal*
- *Trauma, Violence, and Abuse*
- *Psychology of Violence*
- *Journal of Interpersonal Violence*
- *Demography*
- *International Journal of Gynecology and Obstetrics*
- *Journal of American College Health*
- *Perspectives on Sexual and Reproductive Health*
- *International Journal of Sexual Health*

RECOMMENDATIONS

The findings of these studies point to the need for comprehensive sexual health interventions for African American late adolescents. Interventions should be developed and adapted to focus on the unique developmental stage of late adolescents and that are culturally appropriate for African American youth. The developmental stage of youth in late adolescence is a crucial time for sexual health interventions. Becoming a sexually healthy adult is a developmental task of late adolescence and youth are transitioning to adult roles in relationships, school, and work (Tulloch & Kaufman, 2013).

PROGRAMS FOR PREVENTION OF UNINTENDED PREGNANCY

While, traditionally, sexuality education programs in the United States have focused on secondary education, many of the characteristics of effective programs can easily be adapted to develop developmentally appropriate programs for late adolescents who have graduated from high school (Kirby, 2007; Suellentrop, 2011). Evidence-based sexual health interventions that have been shown to be effective with late adolescents include small-group community-based interventions (FOCUS) and collaborative programs between schools and health centers (Teen Talk) (Boyer et al., 2005; Eisen et al., 1992).

Healthy Relationship Skill-Building

Healthy relationship education for adolescents is typically offered as school-based programs for middle and high school students (Clinton-Sherrod et al., 2016b). The current studies indicate the continued need for university- or community-based healthy relationship education among 18- and 19-year-old African American young

women and their male partners, who are not frequently served by typical relationship education programs.

Substance Use Prevention

Findings from the current studies suggest the importance of integrating substance use prevention into sexual health interventions for late adolescents. Project MARS is a small-group community-based intervention for that successfully incorporated alcohol and drug prevention into a single 2-hour session based on motivational interviewing (Bryan et al., 2018).

First-Generation College Students Attending HBCUs

The findings from the current studies suggest the importance of educating female HBCU students whose mothers have lower levels of education about contraception and sexual health. First-generation college students represent 45% of students at HBCUs (Espinosa et al., 2018). Programs for first-generation students already exist on many college campuses (Whitley et al., 2018). Integrating evidence-informed sexual health content into these existing programs could provide needed information to first-generation college students at HBCUs. Recent research supports the use of brief, tailored, sexual health seminars with college students, and has found that college students may not want sexual health education that is incorporated into college classes (King et al., 2020; Olmstead et al., 2019).

Parents of Adolescents

In addition to sexuality education for adolescents, these studies highlight the important role of mothers in predicting late adolescents' consistent contraception use. This points to the importance of sexual health programs that involve both parents and adolescents. Evidence-based programs exist that are designed to

promote effective communication skills, build parent-adolescent relationships, help parents develop successful monitoring strategies, and teach adolescents assertiveness and refusal skills (Guilamo-Ramos et al., 2011). However, these programs are often aimed at parents of younger adolescents, indicating the need for interventions for parents of older adolescents as well.

PROGRAMS FOR YOUTH EXPERIENCING IPV

Condom Use Skill-Building

The findings from these studies also suggest the importance of educating late adolescents who have experienced psychological aggression victimization about condom use skills. Integrating evidence-based sexual health interventions into existing services for late adolescents who are victims of psychological aggression will provide them with the comprehensive services they need. The Safer Sex Intervention (SSI) has been shown to increase consistent condom use among female adolescents (ages 14–19) in the same Southern city as the current study (Jenner et al., 2015). SSI involves four one-on-one sessions between the young woman and a female health educator and uses motivational interviewing to assess participants' personal sense of risk and provide tailored health messages to help participants adopt and maintain consistent condom use (Shrier et al., 2001).

Steady Relationships

These findings suggest the importance of educating late adolescents about healthy relationship skills, particularly young women and men who are in long-term partnerships. Traditional IPV interventions focus on providing services and treatment for victims after they experience IPV, although there is a growing

movement toward healthy relationship education for preventing IPV (Antle et al., 2011). Healthy relationship education for adults is typically offered as couples counseling (Clinton-Sherrod et al., 2016b). Couples counseling is most common when couples are entering marriage (Halford, 2004). Marriage is uncommon among this age group, only one participating young woman was married. This indicates a need to expand traditional couples counseling to be relevant to late adolescents.

SERVICES FOR YOUNG WOMEN EXPERIENCING DEPRESSION

IPV Screening

Results from these studies also suggest that young women with depressive symptoms should be targeted to identify psychological aggression in relationships and for healthy relationship skill-building. Depressive symptoms and psychological aggression victimization may be comorbid conditions that should be screened for together to identify young women who may be experiencing IPV. There are many valid and reliable IPV screening tools developed for and tested in clinical settings (Paterno & Draughon, 2016). Clinicians should ensure that the screening tool they use includes psychological aggression, as many of the tools focus on physical violence (Ramaswamy et al., 2019). Young women who are identified as victims of psychological aggression (with or without comorbid depression) should be asked if they want help, offered assistance and options for help, and encouraged to create a safety plan (Paterno & Draughon, 2016). Young women with comorbid depression should also be referred to a licensed mental health professional and their mental health treatment should include individualized relationship education.

Contraception Counseling

Additionally, these results suggest that young women with depressive symptoms should be screened for inconsistent contraception use and provided with contraception counseling. A review of the literature by Lopez and colleagues (2016) found that the most effective brief interventions to improve consistent contraception use among adolescents was developmental contraception counseling. Adolescents who received contraception counseling and a follow-up phone consultation used birth control more consistently than adolescents who received counseling alone (Berenson & Rahman, 2012).

CONCLUSION

Psychological aggression victimization is common among 18- and 19-year old African American young women and their male sexual partners. Healthy relationship-skill building is essential for young men and women. Additionally, first-generation college students at HBCUs need sexual health programming to prevent unintended pregnancies that could negatively impact educational attainment. Comprehensive interventions and wrap-around services are needed to improve the sexual health of late adolescents. Interventions and counseling should be evidence-informed and tailored to the unique needs of African American late adolescents. These studies provide critical evidence for interventions to improve the sexual health of African American late adolescent women.

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XI. APPENDICES

APPENDIX A: *YOU GEAUX GIRL* PROGRAM IMPACT SURVEY

I. GENERAL HEALTH INFORMATION

1. What is your current height? **[FILL IN THE BLANKS]**
_____ Feet ____Inches **HEIGHT**

2. What is your current weight? **[FILL IN THE BLANK]**
_____ Pounds **WEIGHT**

3. **(Add Health Wave III)** How do you think of yourself in terms of weight? **[CHOOSE ONE]**
___ very underweight
___ slightly underweight
___ about the right weight **PERCWT**
___ slightly overweight
___ very overweight

4. What kind of health insurance or health care coverage do you currently have? **[CHOOSE ALL THAT APPLY] INSURAN[X]**
___None [SKIP to Q6]
___Private insurance (Blue Cross Blue Shield/Humana/United Health Care/Others)
___Medicare
___Medicaid / for example, Take Charge
___
___LACHIP (CHIP/ Children's Health Insurance Program)
___Military Health Care (Tricare/VA/ CHAMP-VA)
___Other type, Please Explain_____
___I have insurance, but don't know what kind
___I don't know if I have insurance

5. Who do you currently live with? (check all that apply): [**LIVE**]
_____ Mother
_____ Father
_____ Grandparent(s)
_____ Other relative(s)
_____ Friends
_____ By myself
_____ Other, explain _____ [**LIVEOT**]

6. How long have you lived in that household? [**LIVELON**]

_____ Less than a month
_____ 1-6 months
_____ More than 6 months.

7. Are you currently trying to get pregnant or avoid pregnancy [**F/U ONLY**]? [1] **[CHOOSE ONE]**

_____ Trying to get pregnant
_____ Wouldn't mind getting pregnant (=Ambivalent)
_____ Wouldn't mind avoiding pregnancy (=Ambivalent) **GETPREG**
_____ Trying to avoid pregnancy
_____ Don't know (=Ambivalent)

8. **(BRFSS-2011)** Has a doctor, nurse, or other health professional ever told you have diabetes? **[CHOOSE ONE]**

___ Yes
___ Yes, but told only during pregnancy
___ No **DIABTES**
___ No, but told pre-diabetes or borderline diabetes
___ Don't know/ Not sure

9. In the **past year** have you gone to a doctor, nurse, or other health professional and you were given any of the following? [**CHOOSE ALL THAT APPLY]** ***WELLWV[X]***

___ Breast exam
___ Pelvic exam (Pap smear and/or STD exam)
___ HPV vaccination
___ Birth Control
___ I saw a doctor, nurse, or other health professional in the last year but was **not** given any of the above
___ I have not seen a doctor, nurse, or other health professionalin the last year
____ Other, please specify_____

II. General Diet and Exercise

These next questions will ask you about your general diet and exercise. When we mention exercise we are talking about any exercise that raises your heart rate, such as Active gaming devices (i.e. Wii fit, Dance Dance Revolution), Aerobics class, Bicycling, Bicycling machine exercise, Dancing, Gardening**,** Jogging/ Running, Stair climbing, Swimming, Team Sports (i.e. Basketball, Softball, Volleyball)**,** Walking, Weight lifting, and Jumping rope.

10. (aYRBSS-2011) During the **past 7 days**, on how many days were you physically active for a total of **at least 30 minutes per day**? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.) [**CHOOSE ONE**] ***EXCWEEK***

___ 0 days
___ 1 day
___ 2 days
___ 3 days
___ 4 days
___ 5 days
___ 6 days
___ 7 days

11. Do you exercise as much as you would like to?

___ Yes (skip to Q13)
___ No

12. What are your reasons for NOT exercising as much as you would like?

[CHOOSE ALL THAT APPLY] ***EXCNOT[X]***

___ You hate to exercise
___ You've tried to exercise but you keep quitting
___ You can't afford a gym membership
___ You're not seeing any changes in your body
___ You don't know how to exercise
___ You want to exercise but you have to take care of the kids and family
___ Exercise hurts
___ You don't have time
___ You're too tired after work or school
___ You feel embarrassed about exercising in front of people
___ Safety reasons
___ It might harm your hairstyle
___ You don't like to sweat
___ The gym is too far away
___ I am comfortable with my weight
___ Other (please specify)_____ **NOTEXO**

13. In the past **3 months**, how often did you eat meals from a fast food restaurant?

[CHOOSE ONE]

___ Never
___ Rarely
___ Once to three times a month **EATFAST**
___ Once or twice a week
___ Almost every day

14. **(YRBS-2011)** During the **past 7 days**, how many times did you eat **fruit**? (Do **not** count fruit juice.) [**CHOOSE ONE**] ***FRUTEAT***
    - ___ None
    - ___ 1 to 3 times during the past 7 days
    - ___ 4 to 6 times during the past 7 days
    - ___ 1 time per day
    - ___ 2 times per day
    - ___ 3 times per day
    - ___ 4 or more times per day

15. **(YRBS-2011)** During the **past 7 days**, how many times did you eat **vegetables or greens**? [**CHOOSE ONE**] ***VQ22***
    - ___ None
    - ___ 1 to 3 times during the past 7 days
    - ___ 4 to 6 times during the past 7 days
    - ___ 1 time per day
    - ___ 2 times per day
    - ___ 3 times per day
    - ___ 4 or more times per day

16. **(YRBS-2011)** During the **past 7 days**, how many times did you drink a **can, bottle, or glass of soda, sweet tea, or sports drink**, such as Coke, Pepsi, Sprite Nestea, or Gatorade? (Do **not** count diet drinks or zero calorie drinks.) [**CHOOSE ONE**] ***SODADRK***
    - ___ None
    - ___ 1 to 3 times during the past 7 days
    - ___ 4 to 6 times during the past 7 days
    - ___ 1 time per day
    - ___ 2 times per day
    - ___ 3 times per day
    - ___ 4 or more times per day

17. During the past 7 days, how many days did you wake up still tired? [**WAKE**]
    - ___ None
    - ___ 1-2 days
    - ___ 3-4 days
    - ___ 5-6 days
    - ___ 7 days

18. During the past 7 days, on average how many hours of sleep did you get? [**SLEEP**]

___ Less than 5 hours
___ 5-6 hours
___ 7-8 hours
___ More than 8 hours

19. If a person wanted to reduce the amount of fat in their diet, which grilled meat would be the best choice? [REDFAT]

_____ Steak
_____ Sausages
_____ Chicken

20. According to "My Plate", half of your meal should be: [MYPLATE]

____ Meat
____ Fruits and Vegetables
____ Grains
____ Dairy

21. How do you calculate the true number of calories in a drink container? [DRINKT]

____ Multiply calories on label by serving size
____ Multiply calories on label by servings per container
____ Multiply calories on label by total fat
____ Don't know

22. What is a healthy portion? [PORTION]

____ The amount of food you eat in a sitting
____ Healthy portion changes depending on the kind of food you are eating
____ Half the amount of food you normally would eat
____ Don't know

III. GENERAL SEXUAL EXPERIENCE

The next questions are about your sexual experience. When we say **vaginal** sex, we mean the sex act of a man inserting his penis into a woman's vagina even a little bit.

When we say **oral** sex, we mean the sex act of placing one's mouth on the genitals. This could involve licking or sucking the penis, vagina, or anus.

When we say **anal** sex, we mean the sex act involving insertion of the penis into the anus or butt.

23. Who have you had vaginal, oral, or anal sex with? **[CHOOSE ONE]**

___Men only
___Women only **WHOSEX**
___Both men and women
___I haven't had vaginal, oral, or anal sex (SKIP TO GENERAL CONTRACEPTIVE USE SECTION)

24. (OAH) Have you ever had vaginal sex?
[CHOOSE ONE]
___ Yes **VAGINT**
___ No [SKIP TO Q27]

25. (Add Health Wave III) How old were you the first time you had vaginal sex?
[FILL IN THE BLANK] ____ VAGAGE

26. (Add Health Wave III) How many partners have you ever had vaginal sex with?
[FILL IN THE BLANK] ____ VAGPART

27. Have you ever had oral sex? **[CHOOSE ONE]**
___ Yes **ORALINT**
___ No [SKIP TO Q30]

28. How old were you the first time you had oral sex? **[FILL IN THE BLANK] ____**
ORALAGE

29. How many partners have you ever had oral sex with? **[FILL IN THE BLANK] ____**
ORAPART

30. Have you ever had anal sex? **CHOOSE ONE]**
_____ Yes
___ No [SKIP TO Q33] **ANALINT**

31. How old were you the first time you had anal sex? **[FILL IN THE BLANK] ____**
ANALAGE

32. How many partners have you ever had anal sex? **[FILL IN THE BLANK] ____**
ANAPART

33. (OAH) To the best of your knowledge, have you **ever** been pregnant, even if no child was born? **[CHOOSE ONE]**
___ Yes
___ No [SKIP to Q38] **EVRPREG**

34. **(OAH)** To the best of your knowledge, how many times have you been pregnant? **[FILL IN THE BLANK] ____ NUMPREG**

35. To the best of your knowledge, how many still births or miscarriages have you had? **[FILL IN THE BLANK] _____ STBIMSC**

36. How many live births have you had, meaning the birth of a living child? **[FILL IN THE BLANK] _____**] **LIVBIRT**

37. How many of these children currently live with you? **[FILL IN THE BLANK]** _____

CHLDLIV

38. Have you **ever** been told by a doctor, nurse, or health professional that you have any of the following STDs? **[CHOOSE ALL THAT APPLY]** ***STDDIA[X]*** [baseline only]

___Gonorrhea
___Syphilis
___Chlamydia
___Herpes
___Genital Warts
___Trichomoniasis
___ HIV
___ HPV
___ I have never been told by a doctor, nurse, or health professional that that I have an STD
___Other, Please Specify_____

39. Since we saw you last have you been told by a doctor, nurse, or health professional that you have either of the following STDs? **[CHOOSE ALL THAT APPLY]** [**F/U ONLY**]? ***STDFU[X]***

___Gonorrhea
___Chlamydia
___ I have never been told by a doctor, nurse, or health professional that that I have an STD [Skip to Q41]

40. Did you get treated for the STD? [**F/U ONLY**]? ***STDTR[X]***

___Yes, just me
___Yes, myself and my partner
___ No

IV. PAST THREE MONTH SEXUAL PARTNERS

41. (OAH) Now please think about the past three months. In the past 3 months, have you had vaginal sex, even once?

___ Yes **M3VAG**
___ No (SKIP TO Q45)

42. (OAH) In the past three months, how many times have you had vaginal sex?

[FILL IN BLANK] VAGTIME _____

43. (OAH) In the past three months, have you had vaginal sex without you or your partner(s) using any of these methods of birth control?

- Condoms
- Birth control pills
- The shot (Depo Provera)
- The patch
- The ring (NuvaRing)
- IUD (Mirena or Paragard)
- Implant (Implanon)

_____Yes **WOUTEBC**
_____No (SKIP to Q43)

44. (OAH) In the past three months, how many times have you had vaginal sex without using any of these methods of birth control? **[FILL IN THE BLANK]**

_____ **XWOEBC**

45. (OAH) In the past three months, have you had vaginal sex without you or your partner using a condom?

____Yes **WOUTCND**
____No (SKIP to Q45)

46. (OAH) In the past three months, how many times have you had vaginal sex without using a condom? **[FILL IN THE BLANK]**

_____ **XWOUTCD**

47. In the past three months, how many men have you had sex with (oral sex, vaginal sex, or anal sex)? **[FILL IN THE BLANK]** _____ [IF 0, SKIP TO GENERAL CONTRACEPTIVE USE SECTION] **MENSXNV**

48. Please provide the initials for up to four of your most recent male partners in the past three months. **[FILL IN THE BLANKS BELOW;** WILL DEPEND ON NUMBER REPORTED ABOVE**]**

When we mention "sex" or "sexual relationship" in this section, we mean vaginal, oral, or anal sex, unless otherwise specified. Now I have some questions about your relationship with [initials].

	Partner 1 name or initials	Partner 2 name or initials	→ up to 5 partners
a. Partner Characteristics			
49. (AHW4) About how old is [initials] now? **[FILL IN THE BLANK]** **SEXPA#**	_____ Years Old	_____ Years Old	
50. (AHW4) Is [initials] of Hispanic or Latino background? **[CHOOSE ONE]** **SEXPL#**	_____ Yes _____ No	_____ Yes _____ No	
51. (AHW4) What is [initials]'s race? **[CHOOSE ALL THAT APPLY]** **SEXPR#[X]**	___ American Indian or Alaska Native ___ Asian ___ Black or African American ___ Native Hawaiian or other Pacific Islander ___ White ___Some other race (please specify):_____	___ American Indian or Alaska Native ___ Asian ___ Black or African American ___ Native Hawaiian or other Pacific Islander ___ White ___Some other race (please specify):_____	

52. In what month and year did you first meet (initials)? **[FILL IN THE BLANK]** **SEXPM#**	_____/_____ Month Year	_____/_____ Month Year
53. When did you first have sex with (initials)? **[FILL IN THE BLANK]** **SEXPS#**	_____/_____ Month Year	_____/_____ Month Year
54. When is the last time you had sex with (initials)? **[FILL IN THE BLANK]** **LSTSEX#**	_____/_____ Month Year	_____/_____ Month Year
55. (AHW2) Is your sexual relationship with [initials] still going on? **[CHOOSE ONE]** **ONG REL#**	___ Yes **[skip to 55]** ___ No	___ Yes ___ No
56. In what month and year did your sexual relationship	_____/_____ Month Year	_____/_____ Month Year

with (initials) end? **[FILL IN THE BLANK]** **MYE NDP#**		
57. Do you think you will have sex with (initials) again? **[CHOOSE ONE]** **SEXAGN#**	__ Yes __ No __ Don't know	__ Yes __ No __ Don't know
58. Which best describes your relationship with (initials)? **[CHOOSE ALL THAT APPLY]** **REL TYP#[X]**	___ Boyfriend ___ Father of my child ___ Friends with benefits ___ Someone I have sex with, but not necessarily a friend ___ An ex-boyfriend ___ Someone who I want to have a relationship with ___ One night stand ___ Husband ___ Fiancé ___ Other, explain	___ Boyfriend ___ Father of my child ___ Friends with benefits ___ Someone I have sex with, but not necessarily a friend ___ An ex-boyfriend ___ Someone who I want to have a relationship with ___ One night stand ___ Husband ___ Fiancé ___ Other, explain
59. Is (initials) your main or casual partner? A main partner is someone you have a committed relationship with, whereas a casual partner is someone you may not know very well or you	__ Main __ Casual	__ Main __ Casual

don't feel very committed to him.? **[CHOOSE ONE] TYPPART#**		
60. Do you live with (initials)? **[CHOOSE ONE] LIVEWTH#**	___ Yes ___ No	___ Yes ___ No
b. Sexual experiences and contraception / condoms		
61. In the past 3 months, how many times have you had vaginal sex with (initials)? **[FILL IN THE BLANK] XVAGSEX#**	_____ [If 0, skip to Q64]	_____ [If 0, skip to Q64]
62. How many times did you use a condom when having vaginal sex with (initials) in the past 3 months? **[FILL IN THE BLANK] XCNDVAG#**	___ All the time ___ Some of the time ___ None of the time [If None of the time, skip to Q62]	___ All the time ___ Some of the time ___ None of the time [If None of the time, skip to Q62]
63. Did you use a condom the last time you had vaginal sex with (initials)? **[CHOOSE ONE] CNDMVAG#**	___ Yes ___ No	___ Yes ___ No

64. Which of the following things did you use to prevent pregnancy the last time you had vaginal sex with (initials). **[CHOOSE ALL THAT APPLY] BCTYP#[X]**	___ None _____ Condoms _____ Birth control pills _____ The shot (Depo Provera) _____ The patch _____ The ring (NuvaRing) _____ IUD (Mirena or Paragard) _____ Implant (Implanon) ___ Sponge _____ Diaphragm _____ Cervical Cap _____ Other, specify _____ Don't know	___ None _____ Condoms _____ Birth control pills _____ The shot (Depo Provera) _____ The patch _____ The ring (NuvaRing) _____ IUD (Mirena or Paragard) _____ Implant (Implanon) ___ Sponge _____ Diaphragm _____ Cervical Cap _____ Other, specify _____ Don't know
65. In the past 3 months, how many times have you GIVEN oral sex to (initials)? **[FILL IN THE BLANK] XGORSEX#**	_____	_____
66. In the past 3 months, how many times have you had anal sex with (initials)? **[FILL IN THE BLANK] XANALSX#**	_____	_____
67. How often do you discuss birth control with (initials)? **[CHOOSE ONE] DISPREG#**	__Never __Not Very Often __Often __Very Often	__Never __Not Very Often __Often __Very Often

68. How often do you discuss preventing STDs and or /HIV with (initials)? **[CHOOSE ONE] DISCSTD#**	__Never __Not Very Often __Often __Very Often	__Never __Not Very Often __Often __Very Often
69. How many other partners do you think (initials) has had sex with in the past 3 months? **[FILL IN THE BLANK] POTPRT#**	_____	_____
70. How likely are you to get an STD from this partner if you do **NOT** use a condom with him? **STDLIK#**	__Not at all likely __Not very likely __Very likely ____Extremely likely	__Not at all likely __Not very likely __Very likely ____Extremely likely
71. How often did you drink or use drugs before having sex with (initials) in the past 3 months? **[CHOOSE ONE] HIGHSEX#**	__ All of the time __ Some of the time __ Never	__ All of the time __ Some of the time __ Never
72. Has (initials) ever given you money, drugs, or any other items for sex in the past 3 months? **[CHOOSE ONE] TRANSEX#**	___ Yes ___ No	___ Yes ___ No

c. *Relationship Violence (CTS2 Psychological Abuse Subscale, 9 items)*[2]

No matter how well a couple gets along, there are times when they disagree, get annoyed with the other person, want different things from each other, or just have spats or fights because they are in a bad mood, are tired, or for some other reason. Couples also have many different ways of trying to settle their differences. Each of these statements in this section describes things that might happen when you have differences.

Please read or listen to each statement and choose one of the following responses to indicate how many times this happened in your relationship **in the past 3 months**:

73. (Initials) insulted or swore at me, for example, called me fat or ugly. **[CHOOSE ONE]** **CTS21#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened
74. (Initials) shouted or yelled at me. **[CHOOSE ONE]** **CTS22#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened

75. (Initials) hit, kicked, or inflicted some type of physical violence on me. **[CHOOSE ONE]** **CTS23#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened
76. I hit, kicked, or inflicted some type of physical violence on (Initials). **[CHOOSE ONE]** **CTS23#A**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened
77. (Initials) stomped out of the room or house or yard during a disagreement. **[CHOOSE ONE]** **CTS24#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened

78. (Initials) said something to make me angry or hurt me. **[CHOOSE ONE]** **CTS25#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened
79. (Initials) destroyed something belonging to me. **[CHOOSE ONE]** **CTS27#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened
80. (Initials) accused me of being no good in bed. **[CHOOSE ONE]** **CTS28#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened

81. (Initials) threatened to hit or throw something at me. **[CHOOSE ONE]** **CTS29#**	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened	___ Once ___ Twice ___ 3-5 times ___ 6-10 times ___ 11-20 times ___ More than 20 times ___ Not in the past 3 months, but it did happen before ___ This has never happened
d. Relationship Power (Decision-Making Dominance Subscale)[3] Now, we are going to ask you about decision making in your relationship. For each question, please choose whether it is "Your partner," "Both of you equally," or "You."		
82. Who usually has more say about whose friends to go out with? **RELPWR1#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You
83. Who usually has more say about whether you have sex? **RELPWR2#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You
84. Who usually has more say about what you do together? **RELPWR3#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You
85. Who usually has more say about how often you see one another? **RELPWR4#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You

86. Who usually has more say about when you talk about serious things? **RELPWR5#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You
87. In general, who do you think has more power in your relationship? **RELPWR6#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You
88. Who usually has more say about whether you use condoms?** **RELPWR7#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You
89. Who usually has more say about what types of sexual acts you do? **RELPWR8#**	___ Your Partner ___ Both of You Equally ___ You	___ Your Partner ___ Both of You Equally ___ You

V. GENERAL CONTRACEPTIVE USE

90. In the past **3 months**, has there been a time when you wanted to get birth control but couldn't?**[CHOOSE ONE]**

___Yes
___No (Skip to question 89) **BUYBC**

91. What are the reasons that prevented you from getting birth control when you wanted it? **OTHBCIS[X]**

___Couldn't get an appointment with a doctor's office
___Appointment was cancelled by the doctor's office
___Couldn't get transportation to the doctor's office
___Couldn't afford the appointment
___Forgot about the appointment
___Does not apply
___Other, Please Explain_____

92. Are you currently using any of the following types of birth control? **[CHOOSE ALL THAT APPLY] USEBC[X]**

___ Condoms
_____ Birth control pills (go to question 90)
_____ The shot (Depo Provera) (go to question 92)
_____ The patch (go to question 97)
_____ The ring (NuvaRing) (go to question 94)
_____ IUD (Mirena or Paragard)
_____ Implant (Implanon) (go to question 99)
_____ Sponge
_____ Diaphragm
_____ Cervical Cap
___ None of the above [SKIP to COERCIVE EXPERIENCES]

93. For how long have you been using the birth control pill without taking a break? **PILLENG**

_____Less than a month
_____1-6 months
_____More than 6 months

94. During the past three months, did you ever miss two or more pills in a row during the period when you were supposed to be taking your pills? **[CHOOSE ONE]**

___ Yes **MISPILL**
___ No

95. For how long have you been using the shot (Depo Provera)? **BCSLENG**

_____Less than a month
_____1-6 months
_____More than 6 months

96. During the past three months, were you ever late in getting your birth control shot? **[CHOOSE ONE]**

___ Yes
___ No **LATSHOT**

97. For how long have you been using the vaginal ring (NuvaRing)? **VRLENG**

_____Less than a month
_____1-6 months
_____More than 6 months

98. During the past three months, were you ever late in replacing your vaginal ring? **[CHOOSE ONE]**

___ Yes **LATRING**
___ No

99. In the past three months, has your vaginal ring ever fallen out? **[CHOOSE ONE]**

___ Yes **RNGFALL**
___ No

100. For how long have you been using a birth control patch? **BCPLENG**

_____Less than a month
_____1-6 months
_____More than 6 months

101. During the past three months, were you ever late in replacing your patch? (The birth control patch is effective for one week.) **[CHOOSE ONE]**

___ Yes
___ No **LATPTCH**

102. For how long have you been using a birth control implant? **BCILENG**

_____Less than a month
_____1-6 months
_____More than 6 months

103. During the past three months, were you ever late in replacing your implant?

_____ Yes **LATIMPL**
___ No

VI. COERCIVE EXPERIENCES

The next three questions are about physical and non-physical activities that may or may not have happened to you. For these questions, you will choose whether or not something happened to you as well as how often it happened. Remember that all information is kept confidential.

104. **(Add Health Wave IV)** How often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations? **[CHOOSE ONE]** **COERCV3**
[ASK AT BASELINE ONLY]
____ One time
____ Two times
____ Three to five times
____ Six to ten times
____ More than ten times
____ This never happened to me

105. **(Add Health, Wave IV)** Have you ever been forced, in a non-physical way, to have any type of sexual activity against your will? For example, through verbal pressure, threats of harm or by being given alcohol or drugs? Do not include any experiences with a parent or adult caregiver.
[CHOOSE ONE] **COERCV1**
_____ Yes
_____ No

106. **(Add Health Wave IV)** Have you ever been physically forced to have any type of sexual activity against your will? For example, through the use of hitting (with or without an object), pushing, shaking, burning, or by using physical restraints. Do not include any experiences with a parent or adult caregiver.
[CHOOSE ONE] **COERCV2**
____ Yes
____ No

VII. INTENTIONS

The next three questions are about your sexual intentions in the next year. Please choose the most appropriate response.

107. **(OAH)** Do you intend to have vaginal sex in the next year, if you have the chance? **[CHOOSE ONE]**
____ Yes, definitely
____ Yes, probably **INSEXYR**
____ No, probably not
____ No, definitely not

108. **(OAH)** If you were to have vaginal sex in the next year, do you intend to use (or have your partner use) a condom? **[CHOOSE ONE]**

____ Yes, definitely
____ Yes, probably **INCDMYR**
____ No, probably not
____ No, definitely not

109. **(OAH)** If you have vaginal sex in the next year, do you intend to use (or have your partner use) any of these methods of birth control? **[CHOOSE ONE]**

- Condoms
- Birth control pills
- The shot (Depo Provera)
- The patch
- The ring (NuvaRing)
- IUD (Mirena or Paragard)
- Implants (Implanon)

____ Yes, definitely
____ Yes, probably **INBCYR**
____ No, probably not
____ No, definitely not

VIII. PREGNANCY EXPECTANCIES[4]

The next section will ask you about having a baby. After reading each statement, please select how much you strongly agree or strongly disagree with each statement.

	Strongly Disagree	Disagree	Neither Agree	Agree	Strongly Agree
110. A child would give me more of a reason to work towards my career goals. **PREGEX1**	1	2	3	4	5
111. Having a baby would make me feel more acceptable among my friends. **PREGEX2**	1	2	3	4	5
112. Having a baby would make me feel more like an adult. **PREGEX3**	1	2	3	4	5

113. A child would give me more of a reason to complete my education. **PREGEX4**	1	2	3	4	5
114. A child would give me more of a reason to stay away from trouble (excessive parties, drinking, drugs, etc.) **PREGEX5**	1	2	3	4	5
115. Having a baby would give me more attention from my baby's father. **PREGEX6**	1	2	3	4	5
116. Having a child would bring my family closer together. **PREGEX7**	1	2	3	4	5
117. Having a baby would make me feel more responsible. **PREGEX8**	1	2	3	4	5

IX. TP PREVENTION KNOWLEDGE

The next section will ask you about your knowledge of pregnancy prevention. Please select whether you believe each statement to be "True" or "False."

a. ***You can still get pregnant a couple days after sex with your partner because sperm can live for several days after ejaculation into the vagina*** **[CHOOSE ONE]**

___ True **SPRMLIV**
___ False

118. When using a condom, the man should pull out of the woman right after he has ejaculated or cum. **[CHOOSE ONE]**

___ True **PULLOUT**
___ False

119. Lots of sperm must be ejaculated into the woman in order for her to become pregnant. **[CHOOSE ONE]**

___ True **NUMSPERM**
___ False

120. When putting on a condom, it is important to have it fit tightly, leaving no space at the tip. **[CHOOSE ONE] CNDMFIT**

_____ True
_____ False

121. A woman can take birth control pills at different times of the day as long as she never misses one, and the pill will still work just as fine. **[CHOOSE ONE]**

_____ True **BCMISS**
_____ False

122. Hormonal birth control methods like an shot or pill help reduce STD/HIV transmission as well as pregnancy.**[CHOOSE ONE]**

___ True **HBCSTD**
_____ False

123. Even if the man pulls out before he ejaculates, in other words, even if ejaculation occurs outside of the woman's body, it is still possible for the woman to become pregnant. **[CHOOSE ONE]**

_____ True **EJACOUT**
_____ False

124. Emergency Contraception or "The Morning After Pill" is only effective when taken within 24 hours of having sex. **[CHOOSE ONE]**

_____ True **EMRGPIL**
_____ False

125. Condoms, if used correctly, are the only birth control method that works to prevent pregnancy and reduce STD/HIV transmission. **[CHOOSE ONE]**

_____ True **CNDMONLY**
_____ False

X. CONTRACEPTIVE SELF-EFFICACY[5]

The items on the following page are a list of statements. Please choose one answer according to how true the statement is of you.

	Not at all true of me	Slightly true of me	Somewhat true of me	Mostly true of me	Completely true of me
126. When I am with a partner, I feel that I can always be responsible for what happens sexually. **CTEFF1**	1	2	3	4	5
127. Even if a partner can talk about sex, I can't tell a man how I really feel about sexual things. **CTEFF2**	1	2	3	4	5
128. When I have sex, I can enjoy it as something that I really wanted to do. **CTEFF3**	1	2	3	4	5
129. If my partner and I are getting "turned-on" sexually and I don't really want to have sex I can easily tell him "No" and mean it. **CTEFF4**	1	2	3	4	5
130. If my partner didn't talk about the sex that was happening between us, I couldn't either. **CTEFF5**	1	2	3	4	5
131. When I think about what having sex means, I can't have sex so easily. **CTEFF6**	1	2	3	4	5
132. If my partner and I are getting "turned-on" sexually and I don't really want to have sex, I can	1	2	3	4	5

	easily stop things so that we don't have sex. **CTEFF7**					
133.	There are times when I'd be so involved sexually or emotionally, that I could have sex even if I weren't protected (using a form of birth control). **CTEFF8**	1	2	3	4	5
134.	Sometimes I just go along with what my partner wants to do sexually because I don't think I can take the hassle of trying to say what I want. **CTEFF9**	1	2	3	4	5
135.	If there were a man (partner) to whom I was very attracted physically and emotionally, I could feel comfortable telling him that I wanted to have sex with him. **CTEFF10**	1	2	3	4	5
136.	I couldn't continue to use a birth control method if I thought my parents might find out. **CTEFF11**	1	2	3	4	5
137.	It would be hard for me to go to the drugstore and ask for sexually related items (such as condoms, a diaphragm, a pill prescription, etc.) without feeling embarrassed. **CTEFF12**	1	2	3	4	5

138. If my partner and I were getting really excited and moving towards sex and I wasn't protected . . .					
a. I could easily ask him if he has protection (or tell him that I didn't). **CTEFF13**	1	2	3	4	5
b. I could excuse myself to put in a diaphragm or sponge (if I used them for birth control). **CTEFF14**	1	2	3	4	5
c. I could tell him that I was on the pill or had an IUD (if I used them for birth control). **CTEFF15**	1	2	3	4	5
d. I could stop things before sex, if I couldn't bring up a subject of protection. **CTEFF16**	1	2	3	4	5
139. There are times when I should talk to my partner about using contraceptives; but, I can't seem to do it. **CTEFF17**	1	2	3	4	5
140. Sometimes I end up having sex with a partner because I can't find a way to stop it. **CTEFF18**	1	2	3	4	5

XI. DEPRESSION[6]

The next section lists of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week by choosing the most appropriate answer.

USE THE FOLLOWING RESPONSE ITEMS: **[CHOOSE ONE]**
0 = Rarely or none of the time (Less than 1 day)
1 = Some of a Little of the Time (1-2 days)
2 = Occasionally or a Moderate Amount of the Time (3-4 days)
3 = Most or All of the Time (5-7 days)

141.	I felt depressed. **CESD6**	0	1	2	3
142.	I felt that everything I did was an effort. **CESD7**	0	1	2	3
143.	My sleep was restless. **CESD11**	0	1	2	3
144.	I was happy. **CESD12**	0	1	2	3
145.	I felt lonely. **CESD14**	0	1	2	3
146.	People were unfriendly. **CESD15**	0	1	2	3
147.	I enjoyed life. **CESD16**	0	1	2	3
148.	I felt sad. **CESD18**	0	1	2	3
149.	I felt that people disliked me. **CESD19**	0	1	2	3
150.	I could not get "going." **CESD20**	0	1	2	3

XII. Social Desirability

152. I always admit when I make a mistake. **SOCDES1**
___Yes
___No

153. I always try to practice what I preach. **SOCDES2**
___Yes
___No

154. I never get upset when being asked to return a favor. **SOCDES3**
___Yes
___No

155. I am never mad when people have different ideas from my own. **SOCDES4**
___Yes
___No

156. I have never said something on purpose to hurt someone's feelings. **SOCDES5**
___Yes
___No

157. Sometimes I like to gossip. **SOCDES6**
___Yes
___No

158. There have been times when I took advantage of someone. **SOCDES7**
___Yes
___No

159. Sometimes I try to get even rather than forgive and forget. **SOCDES8**
___Yes
___No

160. Sometimes I really insist on having things my way. **SOCDES9**
___Yes
___No

161. Sometimes I wanted to break things. **SOCDES10**
___Yes
___No

XIII. SOCIAL SUPPORT[7,8]

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. **[CHOOSE ONE]**

Circle the "1" if you **Very Strongly Disagree**
Circle the "2" if you **Strongly Disagree**
Circle the "3" if you **Mildly Disagree**
Circle the "4" if you are **Neutral**
Circle the "5" if you **Mildly Agree**
Circle the "6" if you **Strongly Agree**
Circle the "7" if you **Very Strongly Agree**

162. There is a special person who is around
5 when I am in need. **PSS1**
163. There is a special person with whom I can share my joys and sorrows. **PSS2**
164. My family really tries to help me. **PSS3**
165. I get the emotional help and support I need from my family. **PSS4**
166. I have a special person who is a real source of comfort to me. **PSS5**
167. My friends really try to help me. **PSS6**
168. I can count on my friends when things go wrong. **PSS7**
169. I can talk about my problems with my family. **PSS8**
170. I have friends with whom I can share my joys and sorrows. **PSS9**
171. There is a special person in my life who cares about my feelings. **PSS10**
172. My family is willing to help me make decisions. **PSS11**
173. I can talk about my problems with my friends. **PSS12**

XIV. SELF-ESTEEM[9]

In the next section, there is a list of statements dealing with your general feelings about yourself. Please select how much you strongly agree or strongly disagree with each statement. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**. **[CHOOSE ONE]**

174.	On the whole, I am satisfied with myself. **RSE1**	S	I	A	S
		D		A	
175.	At times, I think I am no good at all. **RSE2**	S	I	A	S
		D		A	
176.	I feel that I have a number of good qualities. **RSE3**	S	I	A	S
		D		A	
177.	I am able to do things as well as most other people. **RSE4**	S	I	A	S
		D		A	
178.	I feel I do not have much to be proud of. **RSE5**	S	I	A	S
		D		A	
179.	I feel useless at times. **RSE6**	S	I	A	S
		D		A	
180.	I feel that I'm a person of worth, at least equal with others. **RSE7**	S	I	A	S
		D		A	
181.	I wish I could have more respect for myself. **RSE8**	S	I	A	S
		D		A	
182.	All in all, I am inclined to feel that I am a failure. **RSE9**	S	I	A	S
		D		A	
183.	I take a positive attitude toward myself. **RSE10**	S	I	A	S
		D		A	

XV. SUBSTANCE USE (REACH FOR HEALTH STUDY)

ALCOHOL

The following questions are about alcohol. Alcohol includes drinks such as beer, wine or wine coolers, and liquor such as rum, gin, vodka, or whiskey. In fact, alcohol includes all drinks that have any alcohol in them. If you have a few sips of wine at church, do not include this as "drinking alcohol." Please choose whether or not you have done something or how often you have done it. Remember that your answers are confidential.

184. Have you ever had more than just a few sips of alcohol? **ALCHEVR**
Yes……1
No……..……0

Skip Pattern: If Q171, ALCOHOLEVER = 0, skip to Q176, MRJEVER
DEFINE DRINK: Before we continue, let's briefly review the definition of a drink. A drink is equal to a 12 ounce bottle or can of beer, a 4 ounce glass of wine, a 12 ounce bottle or can of wine cooler, or a shot of liquor, either straight or in a mixed drink. Note: Program above instructions as separate page

185. How many drinks containing alcohol do you have on a typical day when you are drinking?
1 or 2 drinks……1
3 or 4 drinks……2
5 or 6 drinks……3 **DRNKDAY**
7 to 9 drinks……4
10 or more drinks…….5

186. During the past 3 months, how often did you have at least one drink of alcohol? **ALC90D**

0 times ……..0
Once a month or less ……1
More than once a month but less than once a week……..……..2
One or more times a week, but not every day……3
Every day……4

If ALC90D = 0, skip to Q176, MRJEVER

187. During the past 3 months,, how often did you have 4 or more drinks within 2 hours?

DRNK4RW

0 times ……..0
Once a month or less……..1
More than once a month but less than once a week……...2
One or more times a week, but not every day……3
Every day……4

If DRNK4RW = 0, skip to Q176, MRJEVER

188. During the past two weeks, on how many occasions have you had 4 or more drinks within 2 hours?

DROW14D

0 times……0
1 time……..1
2 times……2
3 times……3
4 times……4
More than 4 times……5

MARIJUANA

189. Have you ever smoked marijuana (weed, herb, blunts, pot, joints, etc.), other than just trying a few puffs?

MRJEVER

Yes……1
No ……0

Skip Pattern: If 176, MRJEVER= 0, Don't Know, or Refused, skip to Q178, OTHRDRG

190. During the past 3 months, how often did you smoke marijuana?

MRJ90D

0 times ……..0
Once a month or less……..1
More than once a month but less than once a week……...2
One or more times a week, but not every day……3
Every day……4

OTHER DRUGS

The following questions are about drugs not prescribed for you by a doctor or other health care provider.

191. Have you ever used any kind of drug that was not prescribed for you by a doctor or other health care provider? This does not include marijuana or over the counter medications (available in stores without a prescription).

OTHRDRG

Yes.....1
No 0

Note: If 178, OTHRDRG = 0, skip to Q185, OCMEDS.

192. Have you used cocaine (coke, blow, snow), not including crack cocaine, anytime in the past 3 months?

COCAINE

Yes.....1
No.....0

193. Have you used methamphetamine (speed, meth, chalk, ice, crystal, glass) anytime in the past 3 months?

SPEED

Yes.....1
No.....0

194. Have you used crack cocaine anytime in the past 3 months? **CRACK**

Yes.....1
No.....0

195. Have you used Ecstasy (MDMA, Adam, XTC, clarity, Eve, X, hug, beans, love drug, E, Rolls) anytime in the past 3 months?

ECSTASY

Yes.....1
No.....0

196. Have you used any other drug not prescribed for you by a physician or other health care provider in the past 3 months? Remember, this does not include marijuana, drugs that you shoot into your skin, blood vessel or muscle, or over the counter medication (available in stores without a prescription). **OTHDR90**

Yes.....1
No.....0

197. During the past 3 months, how often did you use <u>any</u> of the drugs that I have just asked you about (not including marijuana)?

DRGFREQ

0 times……..0
Once a month or less……1
More than once a month but less than once a week…….2
One or more times a week, but not every day……..3
Every day……..4

198. Have you used any over the counter medications (available in stores without a prescription) for non-medical purposes (to get high, relax, get a rush, etc.) anytime in the past 3 months? This would include medications like Advil, Robitussin, Nyquil, etc. **OCMEDS**

Yes……1
No……0

199. Have you used any medications prescribed for you by your doctor or health care provider in order to get high, relax, get a rush, etc. anytime in the past 3 months? This would include medications like OxyContin, Valium, Ritalin, Codeine, etc. **RXMEDS**

Yes……1
No……0

INJECTION DRUG USE

200. Have you ever shot drugs into your skin, into a blood vessel, or into a muscle - not including drugs that are prescribed for you by a doctor or health care provider? **INJDRGS**

Yes……1
No ……0

Skip Pattern: If 187, INJDRGS = 0, Don't Know, or Refused, skip to Q189,.

201. During the past 3 months, how often did you shoot drugs into your skin, into a blood vessel, or into a muscle - not including drugs that are prescribed for you by a doctor or health care provider?

INJFREQ

0 times……..0
Once a month or less……1
More than once a month but less than once a week…….2
One or more times a week, but not every day……..3
Every day……4

XVI. OTHER PROGRAMS

202. Have you heard of the DIVAS program? DIVAS means diversity, individuality, vitality, activity, strong? **HEARD**
___ Yes
___ No

203. How did you hear of the DIVAS program? **[CHECK ALL THAT APPLY] HOWHRDV[X]**
___ Friend
___ Relative
___ Sexual Partner
___ Mentor
___ Counselor
___ Other Please specify_____

204. Have you heard of the BUtiful program? BUtiful means Be you, talented, informed, fearless, uncompromised, loved? **HEARBU**
___ Yes
___ No

205. How did you hear of the BUtiful program? **[CHECK ALL THAT APPLY] HOWHRBU[X]**
___ Friend
___ Relative
___ Sexual Partner
___ Mentor
___ Counselor
___ Other Please specify_____

XVII. PROGRAM IMPACT (OAH) (F/U Only) 3 and 9 month follow-up only

206. Would you say that this program was enjoyable to you? (3month only)
___ Strongly agree
___ Agree
___ Neither agree nor disagree **ENJOY**
___ Disagree
___ Strongly disagree

207. How likely are you to recommend this program to others? (3month only)

____ Much more likely
____ More likely
____ About the same **RECOMM**
____ Less likely
____ Much less likely

208. Since we saw you last, have you participated in any of the following programs? The programs could have taken place at your school, community center, or some other organization or agency. [CHOOSE ALL THAT APPLY] OTHPROG

___ Be Proud Be Responsible
___ Becoming a Responsible Teen (BART)
___ Curbing HIV/AIDS Transmission among at-risk youth (CHAT)
___ Focus on Youth with Impact (FOY+Impact)
___ HerStory 1 &2
___ Making Proud Choices-NOLA
___ Media Advocates for Prevention (MAP)
___ Safer Choices
___ Safer Sex Intervention
___ Sisters Informing Healing Living Empowering (SIHLE)
___ The 4Real Health Project
___ Wyman's Teen Outreach Program (TOP)
___ Youth Eradicating AIDS & HIV (YEAH-NOLA)
___ Other (Please specify) _____
____ None

For the next few questions, please think about BUtiful/DIVAS (will be adapted for the group) and how it may have influenced you. You may not have thought about these situations before, but please still answer the questions. Think about what you would do and answer as best as you can.

209. Would you say that being in this program has made you more or less likely to have vaginal sex in the next year? **[CHOOSE ONE]**

____ Much more likely
____ More likely
____ About the same **LKLYSEX**
____ Less likely
____ Much less likely

210. If you were to have vaginal sex in the next year, would you say that being in this program has made you more or less likely to use (or ask your partner to use) any of these methods of birth control? **[CHOOSE ONE]**

- Condoms
- Birth control pills
- The shot (DepoProvera)
- The patch
- The ring (NuvaRing)
- IUD (Mirena or Paragard)
- Implant (Implanon)

___ Much more likely
___ More likely
___ About the same **BUMETHD**
___ Less likely
___ Much less likely

211. If you were to have vaginal sex in the next year, would you say that being in this program has made you more or less likely to use (or ask your partner to use) a condom? **[CHOOSE ONE]**

_____ Much more likely
_____ More likely
_____ About the same **BUCNDM**
_____ Less likely
_____ Much less likely

212. Would you say that being in this program has made you more likely or less likely to abstain from vaginal sex in the next year (abstaining means choosing not to have sex)?
[CHOOSE ONE]

___ Much more likely **BUABST**
___ More likely
___ About the same
___ Less Likely
___ Much less likely

213. Have you been pregnant since we saw you last? [END IF 0]

_____ Yes
_____ No **PREG6MOS** [SKIP 230]

214. How did that pregnancy end? **PREGEND**

___ Still pregnant
___ Live birth
___Still birth/miscarriage/abortion

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APPENDIX B: *YOU GEAUX GIRL* OFFICE OF ADOLESCENT HEALTH EVALUATION ABSTRACT

Evaluation of BUtiful: An Internet pregnancy prevention intervention for older teenage girls in New Orleans, Louisiana

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Intervention Name

Be yoU, Talented, Informed, Fearless, Uncompromised, and Loved (BUtiful), an electronic translation of the intervention Sisters, Informing, Healing, Living, and Empowering (SiHLE)

Intervention Description

BUtiful is an Internet-delivered pregnancy prevention intervention translated from the evidence- based HIV prevention intervention SiHLE. In contrast to SiHLE, which is administered in four group sessions, the BUtiful website is composed of eight successive interactive sessions that participants can access at their convenience within an allotted four weeks. SiHLE content was adapted for

electronic/interactive presentation via BUtiful, and a session on contraception was added to provide a pregnancy prevention component. BUtiful targets women ages 18 to 19.

Participants' access to the website is activated on the day of enrollment and is deactivated at the conclusion of the allotted four weeks. Each session is approximately 30 minutes, depending on the participant's level of interaction. The sessions are presented via video, text, interactive activities, and message boards. Five female characters present the material in the sessions: four young women of the target demographic who present their experiences and work through issues related to topics such as contraception and relationships, and one slightly older moderator whose character presents medically accurate health information and anecdotes of her dealings with pregnancy and a sexually transmitted infection. Staff are available to answer questions about the site and to manage technical difficulties. Contact is maintained with the participants throughout the intervention period through text messages, telephone calls, and email according to participant preference. It is used to positively reinforce progress on the site, remind participants of the four-week timeline, and verify/update participants' contact information. At the end of the four weeks, session material is reinforced in quarterly newsletters that participants may opt out of. This outreach is provided throughout the funding period. No modifications of the intervention were made during implementation.

Counterfactual

Diversity, Individuality, Vitality, Activity and Strong (DIVAS)

Counterfactual Description

DIVAS is an electronic nutrition and wellness attention control program. The DIVAS website is composed of eight sequential interactive sessions that deliver a general health and nutrition curriculum created by the study team. Dosage and delivery mirror the intervention methods, as do the types of activities and characters used in the program, the technical assistance in accessing the website, and the reinforcement of information through quarterly newsletters after the four-week period.

Primary Research Question

What was the impact of the BUtiful intervention, relative to the DIVAS attention control, on the consistent use of reliable contraceptives among 18- and 19-year-old African-American women at 6 months after intervention completion?

Secondary Research Questions

The secondary research questions were: 1) What was the impact of the BUtiful intervention, relative to the DIVAS attention control, on the rate of pregnancy among African-American 18- and 19-year-old women 6 months after intervention completion? 2) What was the impact of the BUtiful intervention, relative to the DIVAS attention control, on the rate of Chlamydia or gonorrhea infection among African- American 18- and 19-year-old women 6 months after intervention completion?

Sample

To be eligible for the evaluation, women had to be 18- or 19-year-old African-Americans who lived in Orleans or Jefferson Parish and were willing to complete eight sessions on the website. Women were ineligible if, at baseline, they were pregnant or intending to become pregnant in the next year or if they have or intend to have sex with women exclusively. A total of 656 women were enrolled and randomized; the analytic sample was comprised of 625 women. Of these 625 women, 515 (82.4%) completed follow up and answered questions regarding contraception and contraceptive adherence and were included in the main analysis for the primary outcome.

Setting

The evaluation took place primarily in the greater New Orleans area. Women were recruited through partner sites (community colleges and universities), community events, or passive recruitment materials (brochures, flyers, referral cards). Enrollment was conducted at a location convenient for the participants that allowed for confidential survey responses. Program delivery was conducted via Internet at the convenience of the participants.

Research Design

The evaluation is an individual randomized controlled trial. The BUtiful study was marketed under the pseudonym "You Geaux Girl!" (YGG!), and all promotional recruitment materials bore YGG! branding. To mask the content of the websites before

enrollment, the study was presented as a health education and empowerment program for 18- and 19-year-old African-American women.

Enrollment was conducted through a phase-in approach. Women who were interested and signed up for the study were contacted within 2 to 3 days (with a maximum of 7 days) by study staff. Staff reviewed eligibility criteria and described the study to each interested woman. If a woman was interested and eligible, an enrollment visit was scheduled at a location convenient to her to obtain informed consent. During the consenting process at the enrollment visit, women were told that YGG! evaluates two online programs that look exactly the same but contain slightly different content and that there was a 50/50 chance of being randomized to one site or the other. The names of the two websites were also disclosed. After obtaining informed consent, a baseline survey was administered and biological specimens were collected to test for pregnancy, Chlamydia and gonorrhea. Afterward, a sequentially numbered and sealed randomization envelope was opened by the study staff to reveal which arm the participant had been assigned. Staff then demonstrated the assigned website and helped with log on procedures. Randomization envelopes were created using a randomization process with a single randomization envelope assigned to a single study participant. Neither staff nor participant knew which arm was being assigned until the randomization envelope was opened to reveal the assignment.

Data collection occurred at enrollment and at 2- (check in), 6- (short term outcomes), and 12-month (long term outcomes) post-intervention follow-ups using audio computer assisted survey instruments or Internet surveys.

An implementation evaluation occurred as part of this study to measure adherence, content and context. Website activity was recorded during the four weeks of program delivery using Google Analytics.

Impact Findings

In an intent-to-treat analysis of short term outcomes, there were no significant differences between participants in the intervention arm and in the control arm for use of consistent reliable contraceptives, Chamydia or gonorrhea infections, and pregnancy at the 6 month follow up.

Implementation Findings

Overall, 23.4% did not complete any sessions, 58.2% completed all 8 sessions and 18.4% partially completed their sessions.

Schedule/Timeline

Sample enrollment ended in September 2014. The 2-month follow-up ended in February 2015, the 6- month follow-up ended in June 2015, and the 12-month follow-up ended in December 2015. This evaluation report focuses on the 6-month follow-up data.

APPENDIX C: PAPER 1 PRELIMINARY ANALYSIS & MODEL BUILDING

Multiple studies of adolescents have demonstrated an association between experiencing childhood sexual abuse and forced sexual intercourse, substance use, having multiple sexual partners, and depression (Cohen et al., 2000; DePadilla et al., 2011; Schraedley et al., 1999; Small & Donell, 1993; Wilsnack et al., 1997). Research has also shown a correlation between forced intercourse and physical dating violence, having multiple sexual partners, and depression (DePadilla et al., 2011; Howard & Wang, 2005; B. C. Miller et al., 1995). Physical intimate partner violence has been associated with substance use and depression (Coker et al., 2002).See **Figure C.1** for a depiction of interactions between correlates, indicated by pink arrows. Variables that are thought to predict the outcome but are not known to be associated with other correlates are not included in the directed acyclic graph. See **Tables C.1 and C.2** for a summary of multilevel correlates along with their definitions, measures, theoretical constructs, and evidence from the literature.

Figure C.1. Directed Acyclic Graph Depicting Relationships between Correlates of Psychological Aggression Victimization of 18- and 19-year-old African American Women by Male Intimate Partners

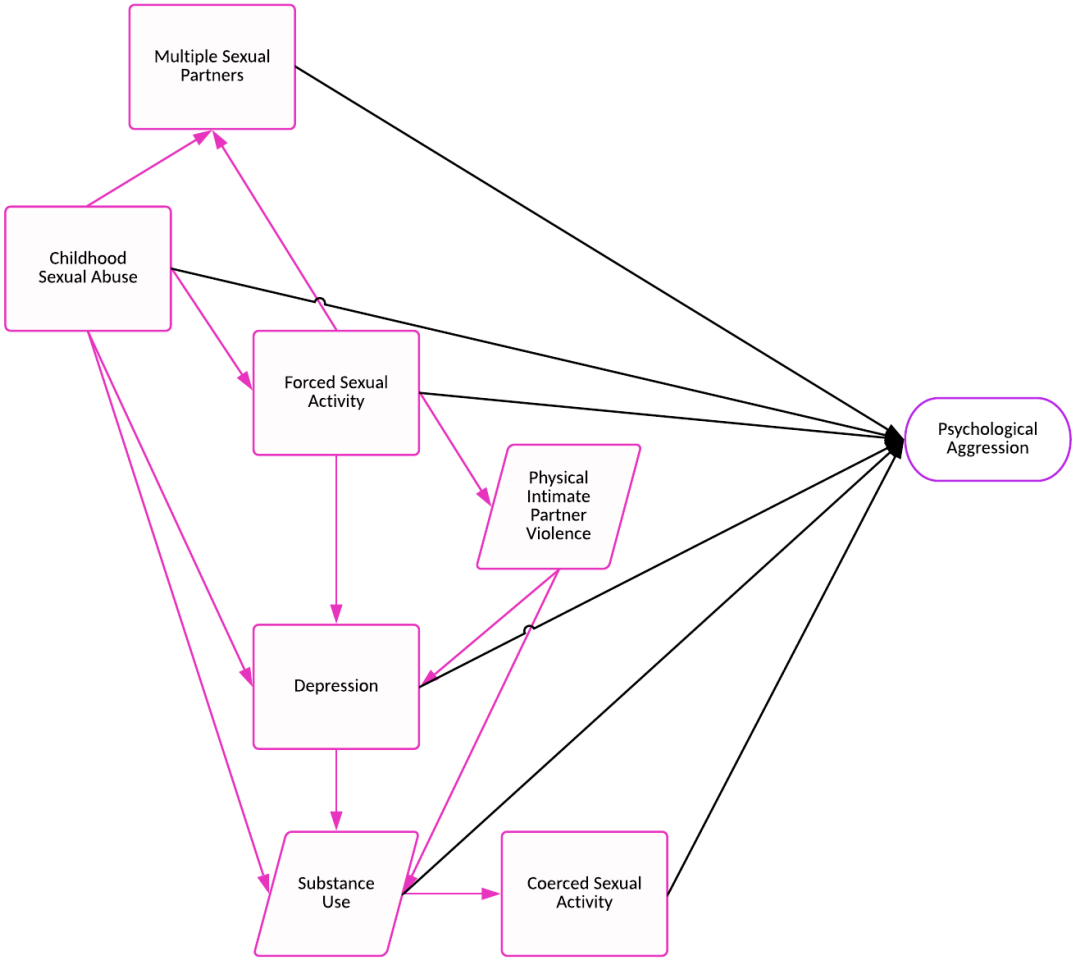


Table C.1. Potential partner-level correlates of psychological aggression by male intimate partners among African American young women

Predictor	Conceptual Definition	Operational Definition[ii]	Theoretical Foundation	Evidence from the Literature
Physical Intimate Partner Violence	Physical violence is defined as "the intentional use of physical force with the potential for causing death, disability, injury, or harm" (Breiding et al., 2015)	In the past 3 months, has [partner] hit, kicked, or inflicted some type of physical violence on you?	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	
Partnership Type	Steady vs. unsteady relationship	Is [partner] your main or casual partner?	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	

[ii] Operational definitions are from the survey tool. See Appendix A.

Predictor	Conceptual Definition	Operational Definition[ii]	Theoretical Foundation	Evidence from the Literature
Partnership Length	Duration of sexual relationship	Relationship length (in months) will be calculated using the date of first and last sexual contact, or the date of the survey if the relationship is ongoing		Among African American women, relationship length is negatively associated with IPV (Caetano et al., 2000).
Partnership Concurrency	Having multiple intimate partners at the same time	Based on the dates of first and last sexual contact, do any partners overlap?		The World Health Organization's Multi-country Study on Women's Health and Domestic Violence found that having outside sexual partners increased the risk of IPV (Abramsky et al., 2011).
Cohabitation	Living with an intimate partner	Cohabiting measured by whether respondent lives with partner		Living with a partner has been found to increase the risk of IPV (Abramsky et al., 2011; Renner & Whitney, 2012).

Predictor	Conceptual Definition	Operational Definition[ii]	Theoretical Foundation	Evidence from the Literature
Substance Use	Substance use with an intimate partner before sexual activity	"In the past 3 months, how often did you drink or use drugs before having sex with [partner]?" Frequency of substance use was measured on a scale of 1–3: 1) all of the time, 2) some of the time, and 3) never	Sexual Division of Power: Behavioral Risk Factors (Wingood & DiClemente, 2002)	Among African American women, alcohol use is a behavioral risk factor positively associated with IPV (Caetano et al., 2000; DuRant et al., 2007; Lipsky et al., 2005; Silverman et al., 2001).
Age of Partner	Age of intimate partner relative to girl	Having a relationship with an older male was assessed by asking "about how old is [partner]?" This will be recoded to classify partners as younger (less than 17), similar in age (17-21), or older (22 and up).	Cathexis: Social Exposures (Wingood & DiClemente, 2002)	

Table C.2. Potential individual-level correlates of psychological aggression by male intimate partners among African American young women

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Sexual Abuse	Sexual abuse by a parent or adult caregiver	Has a parent or other adult caregiver touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	Childhood sexual abuse is a significant predictor of experiencing IPV (Smith et al., 2003).
Forced sexual activity	Victim was physically forced to consent or acquiesce to sexual activity by someone other than a parent/caregiver.	"Have you ever been physically forced to have any type of sexual activity against your will? For example, through the use of hitting (with or without an object), pushing, shaking, burning, or by using physical restraints."	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	Adolescent sexual assault victimization is a predictor of experiencing IPV (Barrick et al., 2013).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Coerced sexual activity	Victim was pressured verbally or through intimidation or misuse of authority to consent or acquiesce to sexual activity by someone other than a parent/caregiver.(Breiding et al., 2015)	"Have you ever been forced, in a non-physical way, to have any type of sexual activity against your will? For example, through verbal pressure, threats of harm or by being given alcohol or drugs?"	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Pregnancy Expectations	Desire to become pregnant or avoid pregnancy	Pregnancy expectations were measured using Positive Orientation to Early Motherhood (POEM) scale (Afable-Munsuz et al., 2006). Each of the 8 measures (career, friends, adult, education, trouble, partner, family, and responsible) were measured on a scale of 1–5, indicating the extent of agreement with the statement. Two summary measures can be created from this scale: POEM-goals (a sum of the career, education, and trouble measures) and POEM-support (a sum of the partner and family measures).	Cathexis: Social Exposures (Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Family Support	Perceived social support adequacy from family	Measured with the Scale of Perceived Social Support (Zimet et al., 1988, 1990). Mean scores will be calculated for family measures.	Cathexis: Social Exposures (Wingood & DiClemente, 2002)	
Number of Sexual Partners	Total number of sexual partners in the woman's lifetime	How many partners have you ever had vaginal sex with?		Lifetime number of sexual partners has been found to be a physical exposure that predicts IPV (Acevedo et al., 2013).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Depression	Exhibit symptoms of depression	Center for Epidemiological Studies of Depression Scale (only 10 of 20 questions were asked) (Radloff, 1991) Circle the number for each statement which best describes how often you felt or behaved this way: 6. I felt depressed 12. I was happy 16. I enjoyed life 18. I felt sad Based on DSM-III dysphoric mood symptoms: A subject is considered positive if score 3 on one or more of CESD 6, 12, 16, 18.	Cathexis: Personal Risk Factors (Wingood & DiClemente, 2002)	Victims of IPV reported more symptoms of recent depression than non-victims (Amar & Gennaro, 2005; Hathaway et al., 2000; Stein & Kennedy, 2001).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Employment	The number of hours worked per week	Employment status was measured by asking whether participants had a job, and if so, how many hours a week they worked. This will be recoded into three categories: no employment, 20 hours or less per week, and more than 20 hours per week.	Sexual Division of Labor: Economic Exposures (Wingood & DiClemente, 2002)	
Health Insurance	Type of health insurance coverage	Participants were asked, "What kind of health insurance or health care coverage do you currently have?"	Sexual Division of Labor: Economic Exposures (Wingood & DiClemente, 2002)	
Level of Education	The highest degree completed	Measured by current year in school & by highest degree completed	Sexual Division of Labor: Economic Exposures (Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Number of Children	The number of children a girl has	Number of children who live with the mother		Among a cross-sectional sample of young adults, number of children was a significant risk factor for IPV (Acevedo et al., 2013).

PRELIMINARY ANALYSIS

Table C.3 Frequency of potential correlates of psychological aggression by male intimate partners among African American young women. **Figure C.2** shows a histogram of psychological aggression; the distribution curve is represented by the red line (kernel) and a normal distribution is represented by the blue line. An index plot (see **Figure C.3**) shows that there is both within- and between-woman variation. There are individual differences in psychological aggression among male sexual partners within each young woman, but also differences in mean psychological aggression victimization across young women. Focusing on the across-girl differences, a histogram (see **Figure C.4**) shows woman-to-woman variation in mean psychological aggression victimization, and the distribution of this variation (red "kernel" line) does not follow the form of a normal distribution (blue line).

Table C.3. Frequency of potential correlates of psychological aggression by male intimate partners among African American young women

Predictor	***Baseline Frequency***
Partner-level Correlates	
Steady Partnership Type (N=534)	374 (70.0%)
Substance Use Before Sexual Activity (N=536)	137 (25.6%)
Partner 4 Years Older or More (N=527)	83 (15.8%)
Physical Intimate Partner Violence (N=536)	20 (3.7%)
Married (N=535)	1 (0.2%)
Cohabitation (N=537)	18 (3.4%)
Shorter Partnership Length (N=203)	144 (70.9%)
Individual-level Correlates	
Sexual Abuse (N=536)	48 (9.0%)
Forced sexual activity (N=536)	48 (9.0%)
Coerced sexual activity (N=536)	76 (14.2%)
6 or more Sexual Partners (N=537)	154 (28.7%)
Desire to Conceive (N=537)	168 (31.3%)
Low Family Support (N=537)	320 (68.7%)
Depression (N=532)	41 (7.7%)
Given Birth to a Child (N=537)	28 (5.2%)
High School Student (N=529)	40 (7.6%)
Unemployment (N=529)	310 (58.6%)
Underemployment (N=537)	144 (26.8%)
No Health Insurance (N=537)	50 (9.3%)

Figure C.2 Distribution of psychological aggression victimization among African American young women

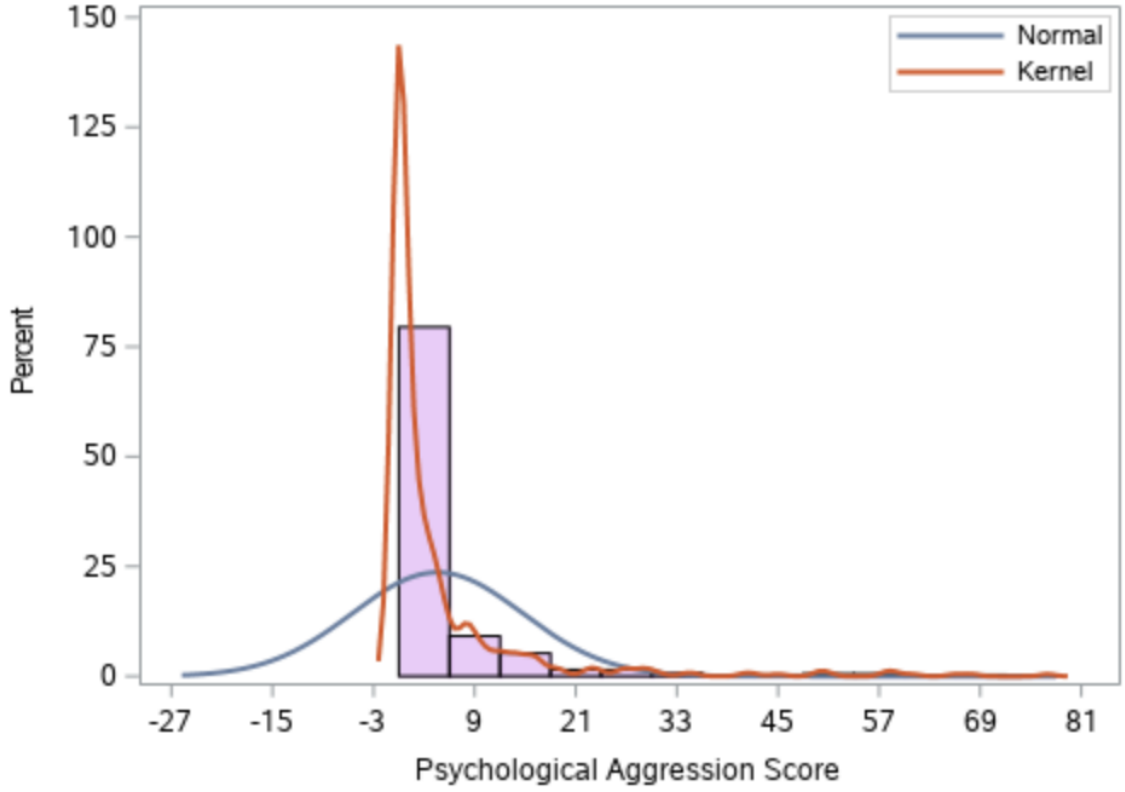
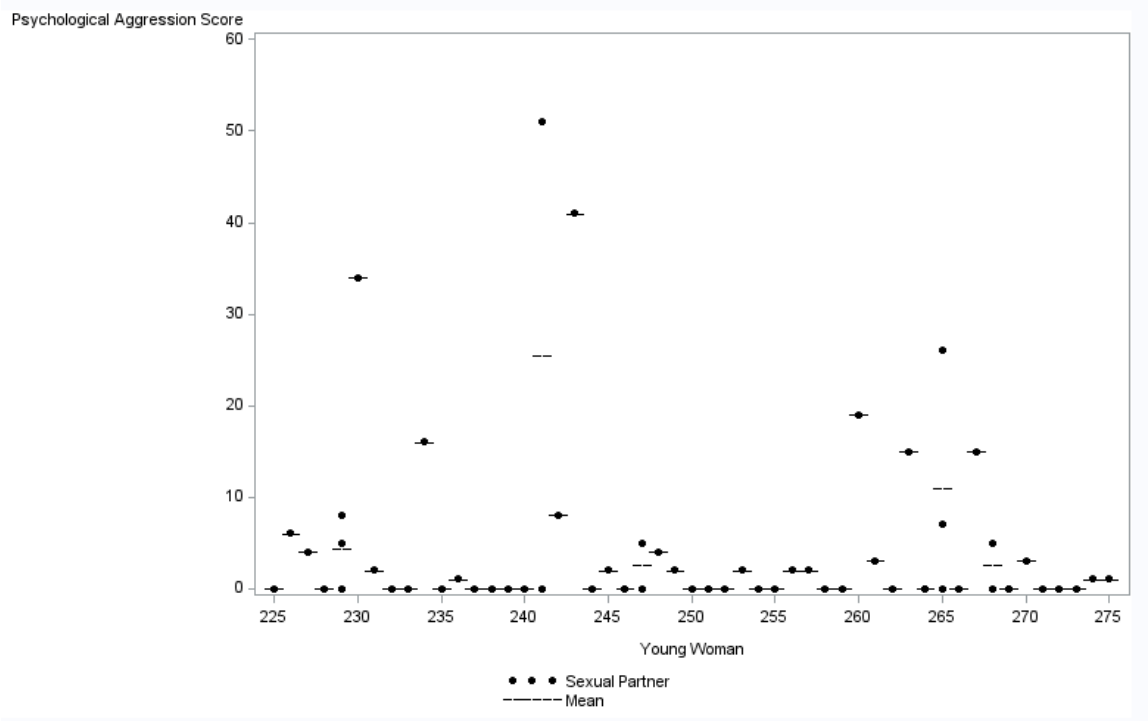
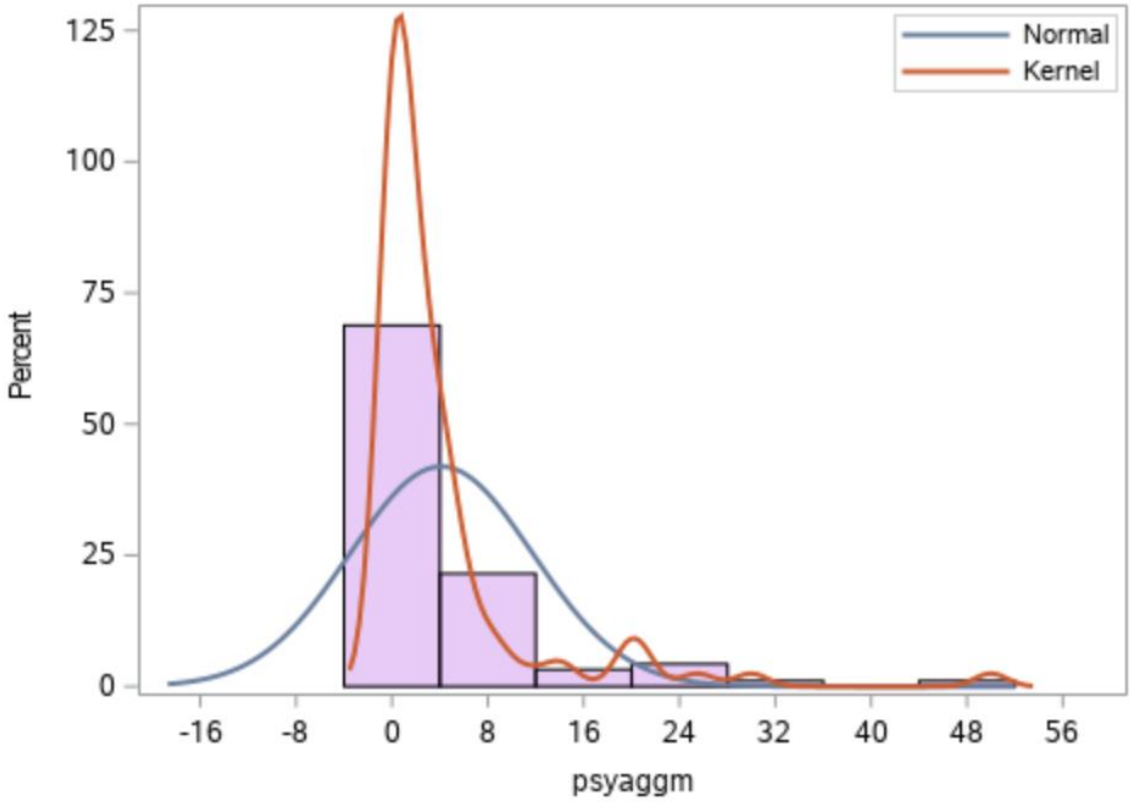


Figure C.3. Within- and Between-Woman Psychological Aggression Variation.*



*Black dots represent the psychological aggression score of each male sexual partner reported by a selection of young women. The dashed line represents the mean psychological aggression score among all male sexual partners reported by an individual young woman. [For young women who only reported one male sexual partner, or whose partners had the same psychological aggression score, the dot(s) and line will overlap.]

Figure C.4. Between-individual variation of psychological aggression victimization



Some of the between-girl variation is due to sampling error since each girl's mean is calculated from very few observations (Bauer & Curran, 2018a). Variability in individual differences were explored graphically by estimating the linear predictor for each young woman (β_{0j}) and then computing predicted probabilities of psychological aggression victimization by plugging the linear predictor into the inverse link function: $\mu_{ij} = e^{\eta_{ij}}$ (Bauer & Curran, 2018b; Fox, 2008). The distributions of the linear correlates (β_{0j}) and predicted probabilities (μ_{ij}) were plotted as histograms. The plot of β_{0j} (see **Figure C.5**) shows variability in the linear predictor, which is not distributed normally. The plot of μ_{ij} (see **Figure C.6**) shows a

fair amount of variability in the probability that an African American young woman will experience psychological aggression from a male sexual partner.

Figure C.5. Distribution of linear correlates

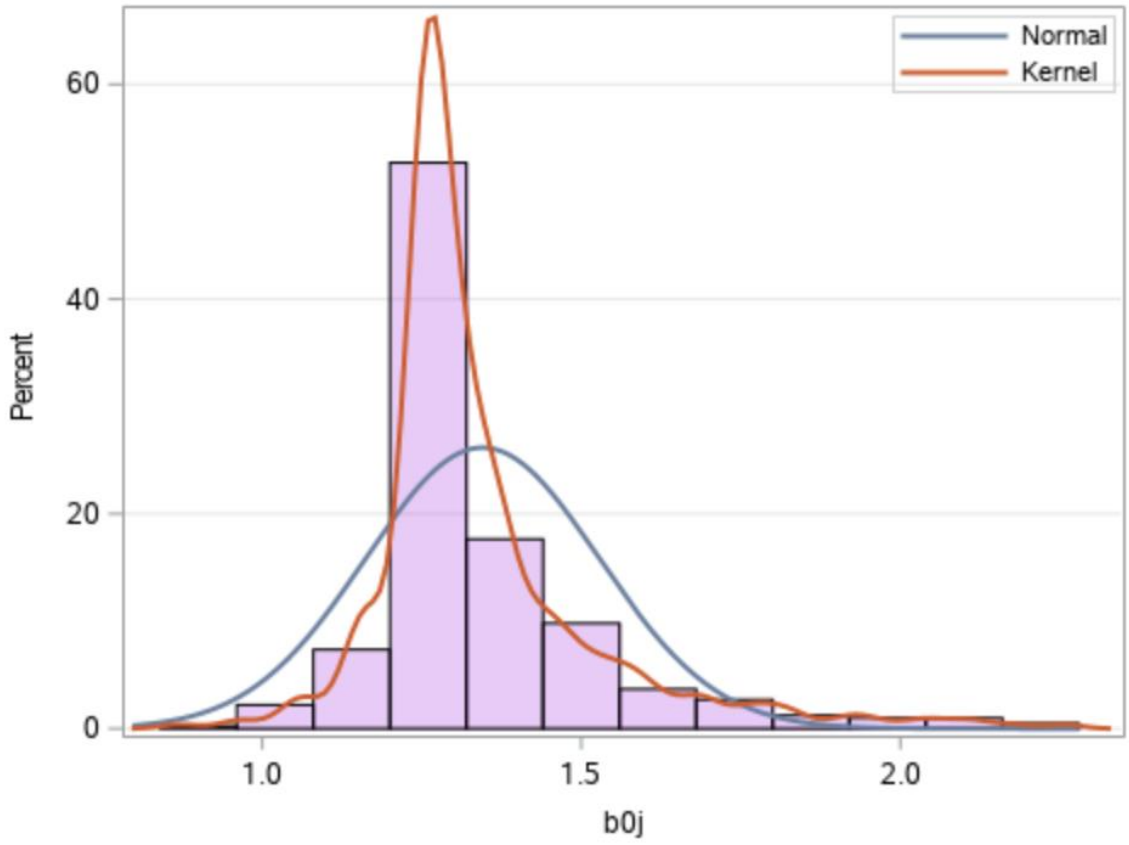
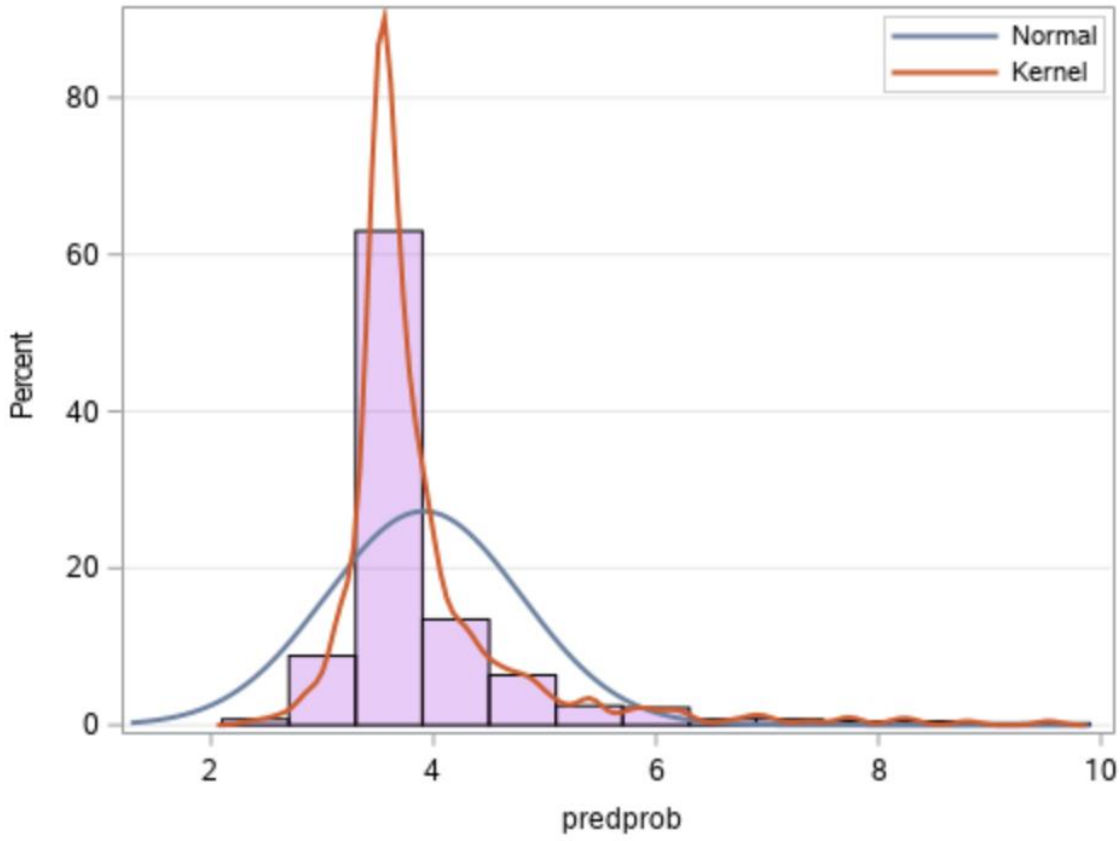


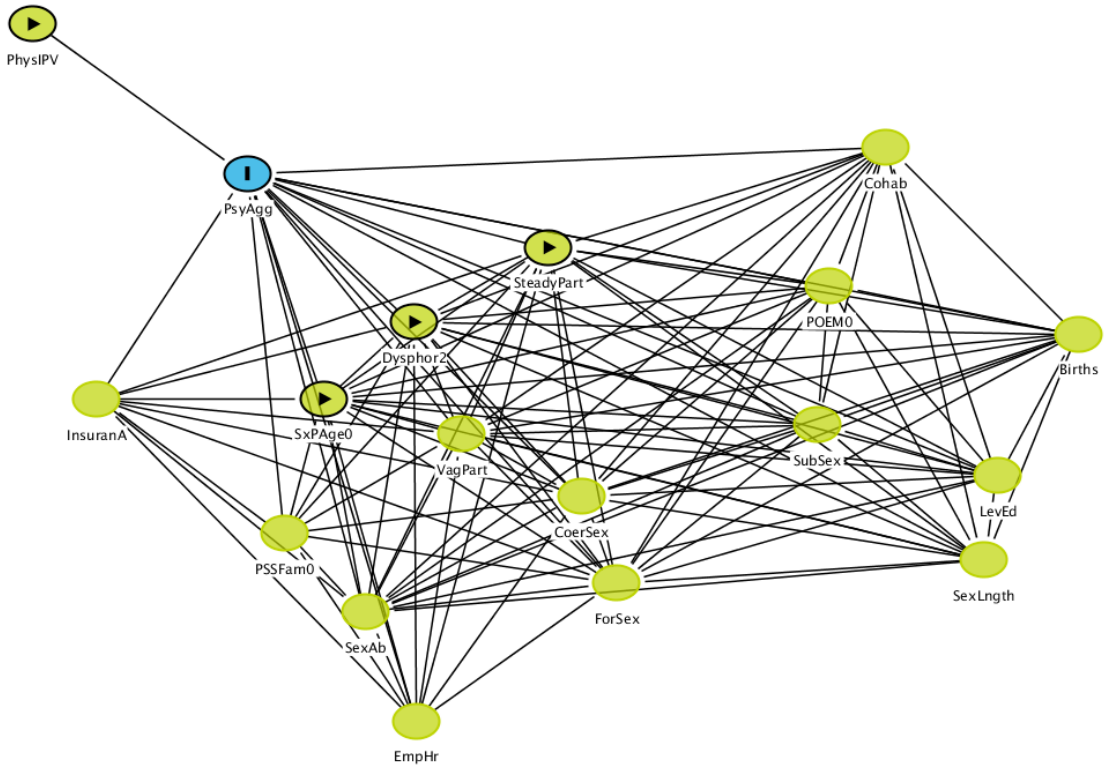
Figure C.6. Distribution of predicted probabilities



MODEL BUILDING

To facilitate interpretation of the intercept and main effects, each predictor was centered so that 0 was a meaningful value (Hoffman, 2015). In order to build an accurate statistical model to test the research aim, additional univariate and bivariate descriptive and graphical analysis were conducted to explore the individual correlates and their effects on psychological aggression victimization and the other correlates (Grace-Martin, 2018). **Figure C.7** shows a correlation graph based on the bivariate analysis (Textor, 2015).

Figure C.7. Correlation graph of correlates of psychological aggression by male intimate partners among African American Young Women in the greater New Orleans area.



Following univariate and bivariate analysis, a preliminary model was developed based on the correlation in the directed acyclic graph (**Figure C.1**). Physical IPV was not included due to low prevalence within the sample. This model showed significant estimated main effects of depressive symptoms (p=0.019) and lifetime number of sexual partners (p=0.004). This model was then expanded to include additional potential predictors (relationship type, relationship length, age of partner, desire to conceive, family support, hours worked per week, no health insurance, level of education, and number of children). Marital status and cohabitation were not included due to low prevalence within the sample. Length of

partnership was not included due to substantial missing data (StatisticsSolutions, 2019). This model showed significant estimated main effects of partnership type ($p<0.0001$) and depressive symptoms ($p=0.0089$). This model was then simplified to remove insignificant interaction terms. The final model consisted of partner-level behavioral risk factors, individual-level personal risk factors and economic exposures, and personal- and individual-level physical and social exposures. Linear predictors in the final model are described by **Equation C.1**.

Equation C.1. Linear predictors in final model.

$$\eta_{ij} = \beta_{0j} + \beta_{1j}SteadyPart_{ij} + \beta_{2j}SubSex_{ij} + \beta_{3j}AgeDif_{ij}$$

$$\beta_{0j}$$

$$= \gamma_{00} + \gamma_{01}SexAb_j + \gamma_{02}ForSex_j + \gamma_{03}CoerSex_j + \gamma_{04}VagPart_j$$

$$+ \gamma_{05}POEM0_j + \gamma_{06}PSSFam_j + \gamma_{07}Dysphor2_j + \gamma_{08}Births_j + \gamma_{09}LevEd_j$$

$$+ \gamma_{010}EmpHr_j + \gamma_{011}InsTyp_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

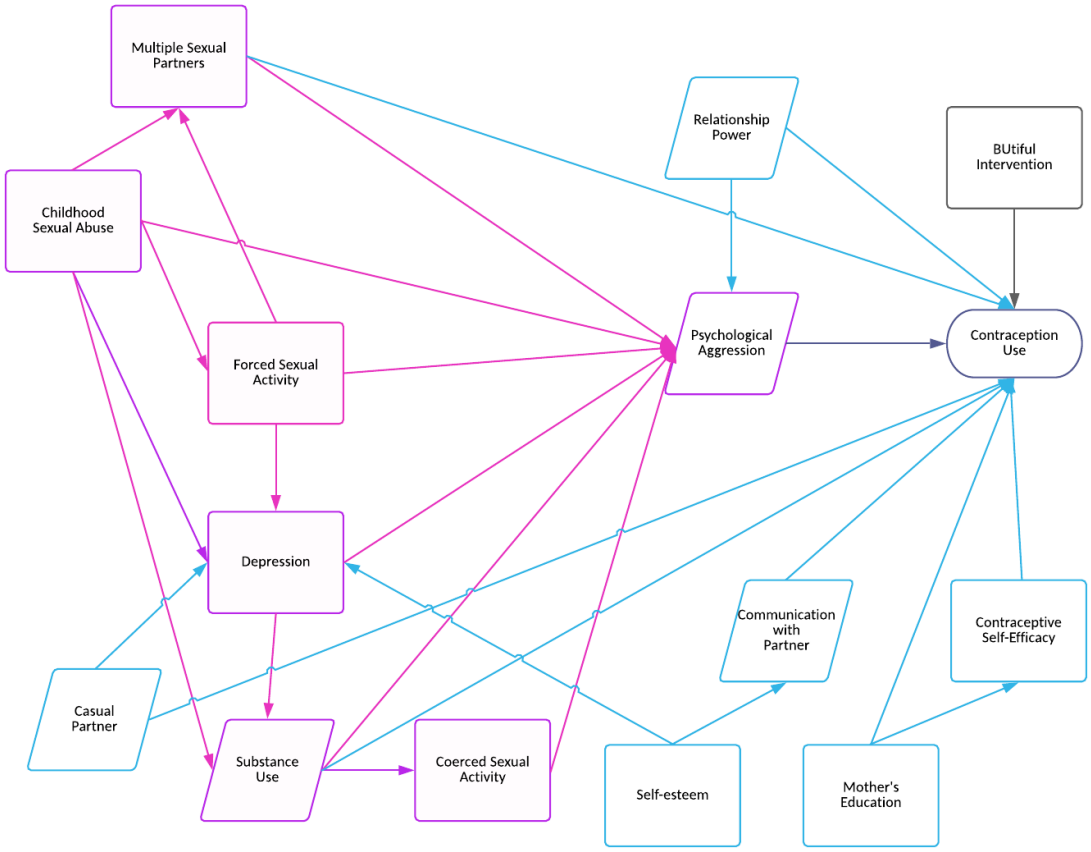
$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

APPENDIX D: PAPER 2 PRELIMINARY ANALYSIS & MODEL BUILDING

Multiple studies of adolescents have demonstrated an association between experiencing childhood sexual abuse and forced sexual intercourse, substance use, having multiple sexual partners, and depression (Cohen et al., 2000; DePadilla et al., 2011; Schraedley et al., 1999; Small & Donell, 1993; Wilsnack et al., 1997). Substance use has been correlated with experiencing sexual abuse among adolescents (DePadilla et al., 2011; Silverman et al., 2001). Self-esteem has demonstrated an association with partner communication and depression (Baumeister et al., 2003; DePadilla et al., 2011; L. F. Salazar et al., 2005). Research has also shown correlation between forced intercourse and having multiple sexual partners and exhibiting symptoms of depression (DePadilla et al., 2011; Howard & Wang, 2005; B. C. Miller et al., 1995). The degree to which one person controls another in a relationship is an important predictor of psychological aggression (Stets, 1991). For emerging-adults, engaging in casual sex may elevate risk for negative psychological outcomes, such as depression (Bersamin et al., 2014). Adolescents whose mothers did not complete high school have been found to report lower contraceptive self-efficacy (Longmore et al., 2003). See **Figure D.1** for a depiction of relationships between predictors.

Figure D.1. Directed acyclic graph depicting relationships between covariates of psychological aggression victimization by male intimate partners and inconsistent contraception use among African American young women



PRELIMINARY ANALYSIS

Preliminary analysis was conducted using SAS® University Edition, which uses SAS Studio 3.71 and runs on SAS 9.4M5 (SAS, n.d.-b, n.d.-c). **Table D.1** shows preliminary analysis of the frequency of the predictor and potential confounders. **Figure D.2** shows the binary distribution of consistent contraception use. Variability in individual differences were explored graphically by estimating the linear predictor for each girl (β_{0j}) and then computing predicted probabilities of

contraception use by plugging the linear predictor into the inverse link function: $\mu_{ij} = \frac{1}{1+e^{-\eta_{ij}}}$ (Bauer & Curran, 2018b). The distributions of the linear predictors (β_{0j}) and predicted probabilities (μ_{ij}) were plotted as histograms. The plot of β_{0j} (see **Figure D.3**) shows variability in the linear predictor, which is not distributed normally (the distribution of the linear predictor is shown by the red "kernel" line). The plot of μ_{ij} (see **Figure D.4**) shows a fair amount of variability in the probability that a young woman will use contraception with a male sexual partner.

Table D.1. Frequency of potential predictors of inconsistent contraception use among 18- and 19-year old African American young women

Variables	***Baseline Frequency***
Independent	
Psychological Aggression Victimization (N=362)	190 (52.5%)
Physical IPV (N=364)	14 (3.8%)
Partner-level Covariates	
Substance Use before Sexual Activity (N=578)	140 (24.2%)
Individual-level Covariates	
Intervention Study Arm (N=364)	173 (47.5%)
Sexual Abuse (N=363)	25 (6.9%)
Forced Sexual Activity (N=426)	30 (7.0%)
Coerced Sexual Activity (N=426)	90 (21.1%)
6 or more Sexual Partners (N=348)	91 (26.1%)
Depressive Symptoms (N=838)	73 (8.7%)
Low Self-esteem (Score<23; N=789)	347 (44.0%)

Figure D.2. Distribution of contraception use among 18- and 19-year-old African American young women

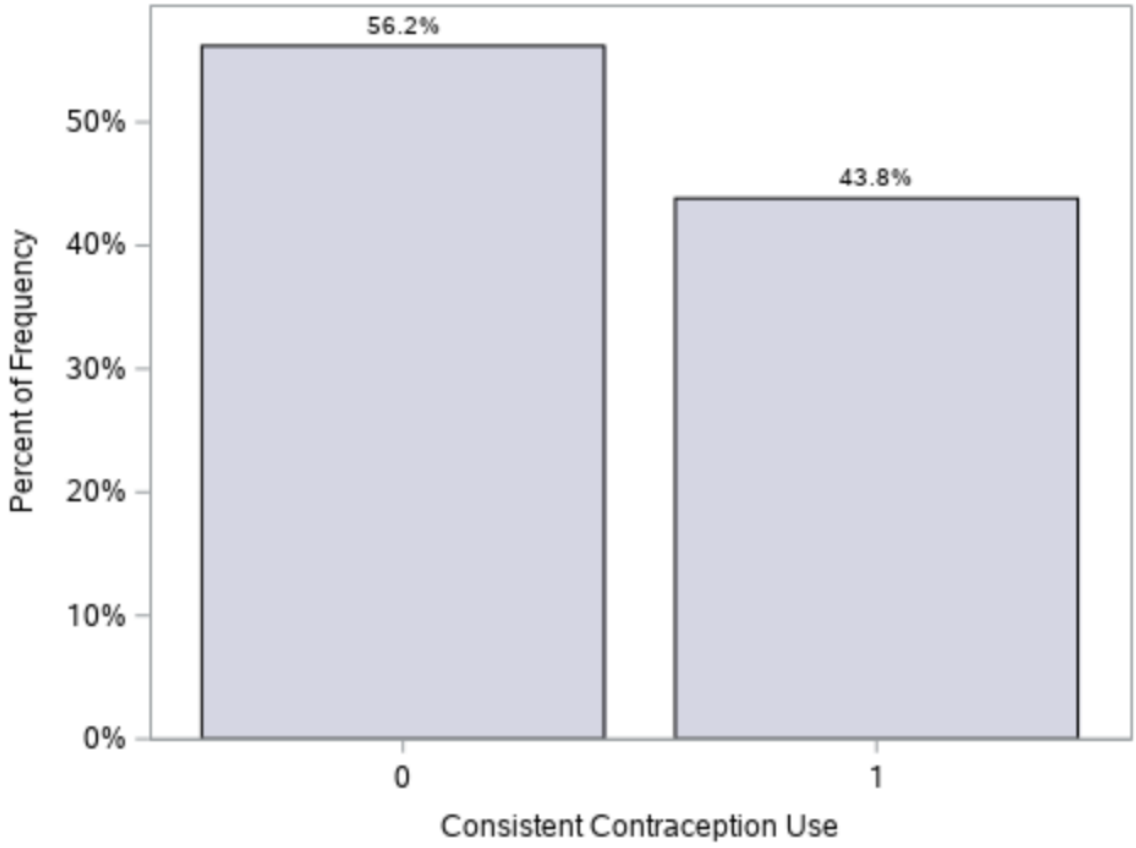


Figure D.3. Distribution of linear predictors

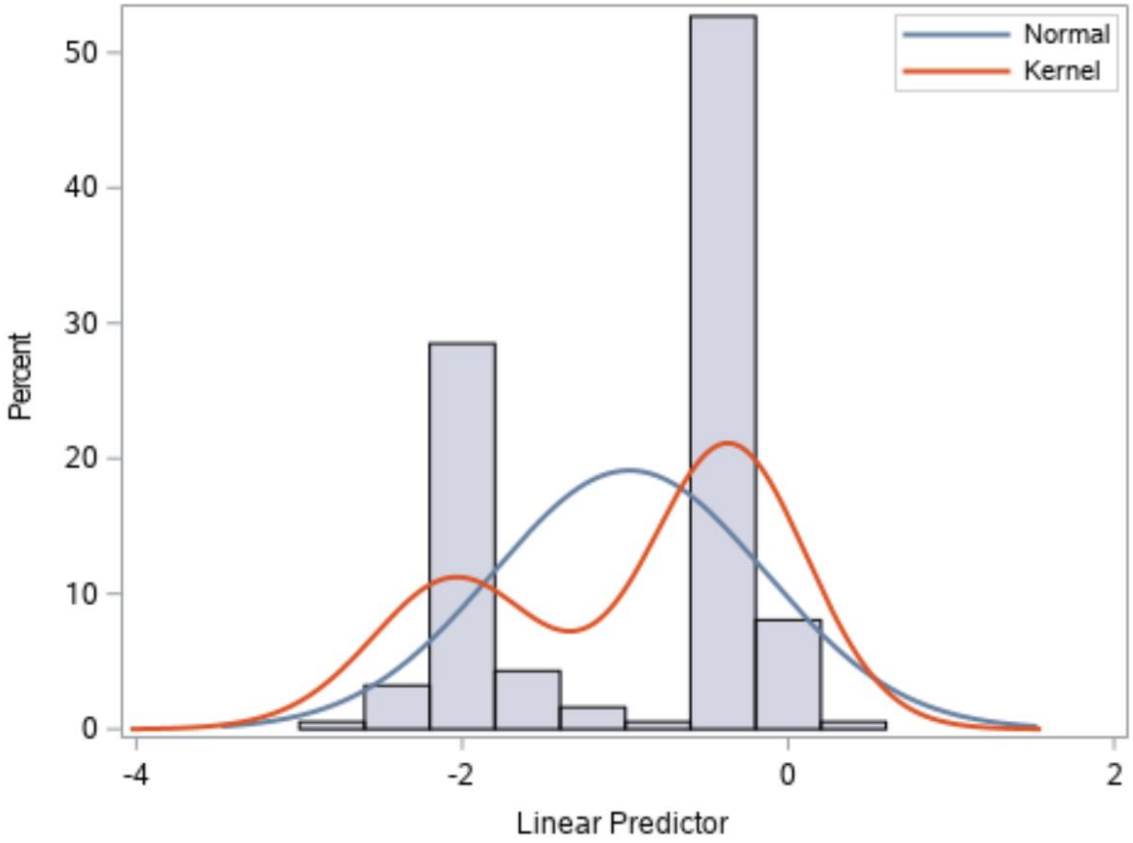
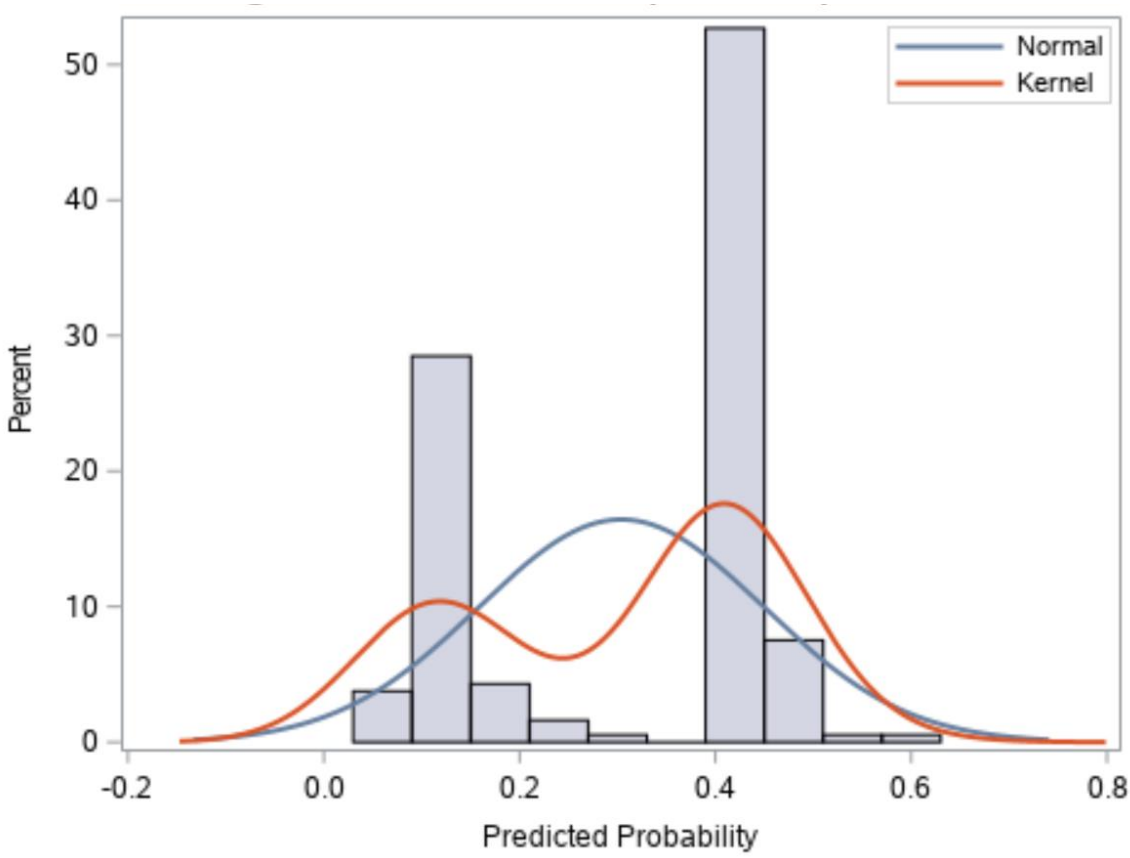


Figure D.4. Distribution of predicted probabilities



To facilitate interpretation of the intercept and main effects, each predictor was centered such that 0 was a meaningful value. In order to build an accurate statistical model to test the research aim, additional univariate and bivariate descriptive and graphical analysis were conducted to explore the individual predictors and their effects on psychological aggression victimization and the other predictors (Grace-Martin, 2018).

A three-level generalized linear growth model was used to try to identify the longitudinal relationship between psychological aggression victimization by a male partner and consistent contraception use (Hoffman, 2013). Level 1 of the model was the measurement time point, level 2 was male sexual partners, who are nested

within participants, who are level 3 (Hoffman, 2015). Preliminary analysis included fitting a null model using adaptive quadrature to observe variability within and between young women (Bauer & Curran, 2018a, 2018b). See **Equation D.1** for the components of the null model. The intraclass correlations were calculated using the variance of logistic distribution (Bauer & Curran, 2018a; Nakagawa et al., 2017). See **Equation D.2** for intraclass correlations. The intraclass correlations imply that if contraception use had been measured on a continuous scale, then none of the variance in levels of contraception use at baseline would be accounted for by individual differences among young women, whereas 10% of the variance in changes over time can be attributed to individual difference among young women.

Equation D.1. Null model

Response Distribution: $ConsBC_{ijk}|\mu_{ijk} \sim BER(\mu_{ijk})$

Linear Predictors: $\eta_{ijk} = \beta_{0jk} + \beta_{1jk} VisitNum_{ijk} + r_{ijk}$

$r_{ijk} \sim N(0, \sigma^2)$

$\beta_{0jk} = \delta_{00k} + \mu_{0jk}$

$\beta_{1jk} = \delta_{10k} + \mu_{1jk}$

$$\begin{pmatrix}\mu_{0jk}\\ \mu_{1jk}\end{pmatrix} \sim N\left[\begin{pmatrix}0\\0\end{pmatrix}, \begin{pmatrix}\tau_{00}^{(2)} & \\ \tau_{10}^{(2)} & \tau_{11}^{(2)}\end{pmatrix}\right]$$

$\delta_{00k} = \gamma_{000} + v_{00k}$

$\delta_{10k} = \gamma_{100} + v_{10k}$

$$\begin{pmatrix}\mu_{00k}\\ \mu_{10k}\end{pmatrix} \sim N\left[\begin{pmatrix}0\\0\end{pmatrix}, \begin{pmatrix}\tau_{00}^{(3)} & \\ \tau_{10}^{(3)} & \tau_{11}^{(3)}\end{pmatrix}\right]$$

Link Function: $\eta_{ijk} = logit(\mu_{ijk})$

Reduced-Form: $\eta_{ijk} = (\gamma_{000} + \gamma_{100} VisitNum_{ijk}) + (u_{0jk} + u_{1jk} VisitNum_{ijk}) + (v_{00k} + v_{10k} VisitNum_{ijk}) + r_{ijk}$

Equation 2.2 Intraclass correlations

$$ICC_{\beta_0} = \frac{\tau_{00}^{(3)} + \tau_{00}^{(2)}}{\tau_{00}^{(3)} + \tau_{00}^{(2)} + \frac{\pi^2}{3}} = \frac{0+0}{0+0+3.29} = 0$$

$$ICC_{\beta_1} = \frac{\tau_{11}^{(3)}}{\tau_{11}^{(3)} + \tau_{11}^{(2)} + \frac{\pi^2}{3}} = \frac{0.3874}{0.3874 + 0 + 3.29} = 0.1053$$

MODEL BUILDING

The generalized linear growth model estimates between-partner differences in within-partner change across by defining the underlying trajectory across the entire sample of male sexual partners among all young women (Curran et al., 2010). Generalized linear growth models are highly flexible in terms of the inclusion of a variety of complexities including partially missing data, unequally spaced time points, non-normally distributed or discretely scaled repeated measures, and time-varying covariates (Curran et al., 2010). The growth model sums the individual contributions of each sexual partner such that observations with a larger number of data points are weighted more heavily than observations with a smaller number of data points (Curran et al., 2010).

Following univariate and bivariate analysis, a preliminary model was developed. Physical IPV and cohabitation were not included due to low prevalence within the sample. This model would not converge, so hours worked per week was removed. Maximum likelihood estimation with adaptive quadrature was used to fit the model and odds ratios were used to interpret results (SAS, n.d.-a). Multivariable regression analysis was used to assess interaction between covariates. Conventional power and sample size methodology does not take into account the combined impact of random model effects and non-normality (Stroup, 2011). Due to this limitation of conventional power size calculations, the approximate power of the regression of each predictor in the model was calculated by defining the critical F-value. If the observed F-value exceeds this number, we reject $H_0: \tau_i = \tau_{i'}$. Then the probability under the non-central F-value defined by the model was determined and

the power was calculated. See **Equation 2.3** for the multilevel logistic growth model.

Equation 2.3. Generalized linear mixed model examining the longitudinal relationship between psychological aggression victimization by a male partner and consistent contraception use among 18- and 19-year-old African American young women

Linear Predictors:

$$\eta_{ijk} = \beta_{0jk} + \beta_{1jk} VisitNum_{ijk} + r_{ijk}$$

$$\beta_{0jk} = \delta_{00k} + \delta_{01k} PartPsyAgg_{jk} + v_{0jk}$$

$$\beta_{1jk} = \delta_{10k} + v_{1jk}$$

$$\delta_{00k} = \gamma_{000} + \gamma_{001} GirlPsyAgg_k + \gamma_{002} ArmNum_k + \gamma_{003} MomEd0_k + \gamma_{004} CurrEd_k + \mu_{00k}$$

$$\delta_{01k} = \gamma_{010}$$

$$\delta_{10k} = \gamma_{100} + \mu_{10k}$$

Response Distribution:

$$ConsBC_{ijk} | \mu_{ijk} \sim BER(\mu_{ijk})$$

Link Function:

$$\eta_{ijk} = logit(\mu_{ijk})$$

Reduced-Form:

$$\eta_{ijk} = \gamma_{000} + \gamma_{100} VisitNum_{ijk} + \gamma_{010} PartPsyAgg_{jk} + \gamma_{001} GirlPsyAgg_k + \gamma_{002} ArmNum_k + \gamma_{003} MomEd0_k + \gamma_{004} CurrEd_k + \left(v_{0jk} + v_{1jk} VisitNum_{ijk}\right) + \left(\mu_{00k} + \mu_{11k} VisitNum_{ijk} PsyAgg_{jk}\right) + r_{ijk}$$

Equation 2.3 provides the final model, the results of which are summarized in **Table 2.4**. The intercept ($\gamma_{000} = -0.78$) is the expected consistent contraception

use log odds for a young woman who has a psychological aggression score of zero and holding all else constant. The estimated main effects of partner's psychological aggression victimization score ($\gamma_{010} = -0.005$) and participant's mean psychological aggression victimization score ($\gamma_{001} = -0.01$) did not indicate that consistent contraception use would be significantly changed by psychological aggression victimization.

Given the low percentage of variance accounted for by individual young women, the method of analysis was changed from a 3-level generalized linear mixed model, to a generalized estimating equation (GEE). The GEE model could not include relationship timeline (first or second reported instance of the partnership) as a panel setting, due to the existence of repeated time values within the dataset. A GEE model looking at contraception use associated with relationship timeline, psychological aggression victimization, study arm, mother's education, young woman's education, and young woman's employment found null results. Another GEE model looking at consistent condom use associated with relationship timeline, psychological aggression victimization, study arm, mother's education, young woman's education, and young woman's employment found a negligible association between inconsistent condom use and psychological aggression victimization (p=0.05). Stata omitted relationship timeline from both of these models due to collinearity.

Straus (1996) states that total numerical scores are preferable for psychological aggression victimization because they permit the measurement of

chronicity, or the number of times the acts in the scale occurred, among those who engaged in at least one of the acts in the scale. However, given the wide range of the scale (0 to 175), a one-unit change may not be meaningful. Final GEE models included psychological aggression score categorized in quartiles. Following revision of the conceptual model, final GEE models were developed based on the correlation in the directed acyclic graph (**Figure D.1**).

Table 2.4. Results of the generalized linear mixed model.

Model Term	Predictor	Regression Coefficient	Standard Error	Probability	Odds Ratio	95% Confidence Interval	Power %
γ_{00}	Intercept	-0.773	0.316	0.015	0.461	0.248 – 0.860	N/A
γ_{100}	Visit number (time)	0	--	--	1.000	--	--
γ_{010}	Partner's psychological aggression victimization score	-0.005	0.017	0.760	0.995	0.962 – 1.029	6.052
γ_{001}	Participant's mean psychological aggression victimization score	-0.009	0.010	0.341	0.991	0.971 – 1.010	15.784
γ_{002}	Study Arm	-0.023	0.145	0.875	0.977	0.734 – 1.301	5.284
γ_{003}	Mother's education level	0.065	0.051	0.203	1.067	0.965 – 1.178	24.594
γ_{004}	Participant's education level	0.086	0.108	0.428	1.089	0.881 – 1.347	12.422

APPENDIX E: PAPER 3 PRELIMINARY ANALYSIS & MODEL BUILDING

Multiple studies of adolescents have demonstrated an association between experiencing childhood sexual abuse and forced sexual intercourse, substance use, having multiple sexual partners, and depression (Cohen et al., 2000; DePadilla et al., 2011; Schraedley et al., 1999; Small & Donell, 1993; Wilsnack et al., 1997). Substance use has been correlated with experiencing sexual abuse among adolescents (DePadilla et al., 2011; Silverman et al., 2001). Research has also shown correlation between forced intercourse and physical dating violence, having multiple sexual partners, and depression (DePadilla et al., 2011; Howard & Wang, 2005; B. C. Miller et al., 1995). Physical intimate partner violence is associated with substance use, depression, and self-esteem (Beadnell et al., 2000; Coker et al., 2002; DePadilla et al., 2011). Self-esteem has demonstrated an association with partner communication and depression (Baumeister et al., 2003; DePadilla et al., 2011; L. F. Salazar et al., 2005). Psychological aggression has been found to predict physical intimate partner violence (Murphy & O'Leary, 1989). The degree to which one person controls another in a relationship is an important predictor of psychological aggression (Stets, 1991). For emerging-adults, engaging in casual sex may elevate risk for negative psychological outcomes, such as depression (Bersamin et al., 2014). Adolescents whose mothers did not complete high school have been found to report lower contraceptive self-efficacy (Longmore et al., 2003). See **Figure E.1** for a more detailed look at relationships between predictors, indicated by blue arrows. Variables that are thought to predict the outcome but are not known to be

associated with other predictors are not included in the directed acyclic graph. See **Tables E.1 and E.2** for a summary of multilevel predictors along with their definitions, measures, theoretical constructs, and evidence from the literature.

Figure E.1. Directed acyclic graph depicting relationships between predictors of inconsistent contraception use among 18- and 19-year-old African American female students attending historically Black colleges and universities

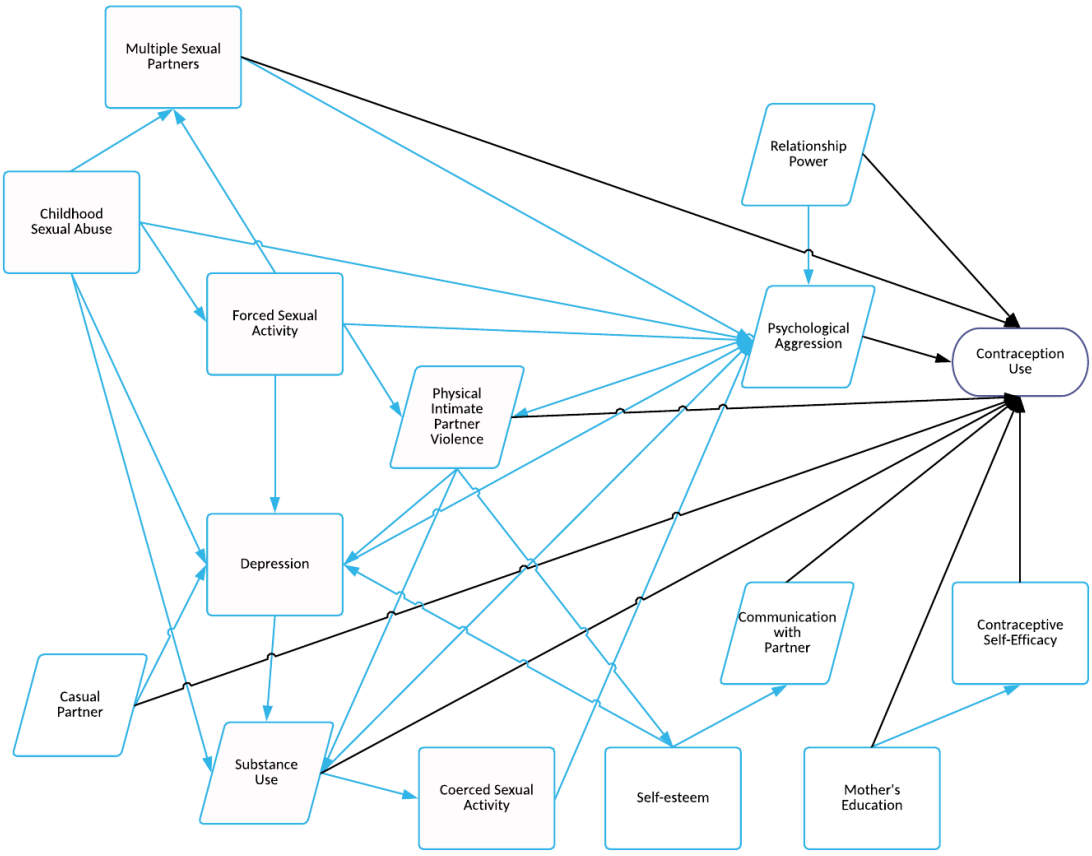


Table E.1. Potential partner-level predictors of inconsistent contraception use among 18- and 19-year old African American female students at historically black colleges and universities

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Psychological Aggression by an Intimate Partner	Psychological aggression is defined as, "Use of verbal and non-verbal communication with the intent to: a) harm another person mentally or emotionally, and/or b) exert control over another person" (Breiding et al., 2015).	Measured by 7 questions from conflicts tactics scale(Straus et al., 1996); scored by number of times this has happened with a total score range of 0 to 175: In the past 3 months, has [partner] done any of the following? A. He has insulted or swore at you B. He shouted or yelled at you C. He stomped out of the room/house/yard during a disagreement D. He said something to make you angry or hurt E. He destroyed something belonging to F. He accused you of being no good in bed G. He threatened to hit or throw something at you	Sexual Division of Power: Physical Exposures (DePadilla et al., 2011)	Current involvement in a verbally abusive relationship was associated with not using a condom during last intercourse (Roberts et al., 2005).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Physical Intimate Partner Violence	Physical violence is defined as "the intentional use of physical force with the potential for causing death, disability, injury, or harm" (Breiding et al., 2015).	Measured by 1 question from conflicts tactics scale; scored by number of times this has happened (Straus et al., 1996): In the past 3 months, has [partner] hit, kicked, or inflicted some type of physical violence on you?	Sexual Division of Power: Physical Exposures (DePadilla et al., 2011; Wingood & DiClemente, 2002)	Adolescent young women' odds of consistent contraceptive use decreased if the relationship involved physical violence (Manlove et al., 2004).
Partnership Type	Steady vs. unsteady relationship	Is [partner] your main or casual partner?	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	Casual sexual relationships have been found to be positively associated with condom use (Alleyne, 2008).
Partnership Length	Duration of sexual relationship	Date of first and last sexual contact		Young women' odds of ever having used contraception increased with longer duration of the relationship (Manlove et al., 2004).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Relationship Power	Which partner has decision-making power in the relationship	Measured with the Decision-Making Dominance subscale of the sexual relationship power scale (Pulerwitz et al., 2000). The final score for the overall Sexual Relationship Power Scale (SRPS) is calculated by rescaling the combined score to a range of 1-4. The range for the low level of power is 1-2.430, the range for the medium level of power is 2.431-2.820, and the range for the high level of power is 2.821-4.		Women with a high level of Decision-Making Dominance are most likely to report consistent condom use (Pulerwitz et al., 2000).
Substance Use	Substance use with each partner before sexual activity	"In the past 3 months, how often did you drink or use drugs before having sex with [partner]?" Frequency of substance use was measured on a scale of 1–3: 1) all of the time, 2) some of the time, and 3) never	Sexual Division of Power: Behavioral Risk Factors (DePadilla et al., 2011; Wingood & DiClemente, 2002)	Substance use has been found to be negatively associated with condom use (Alleyne, 2008).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Communication with Partner	Frequency of communication with each male sexual partner about pregnancy prevention	Measured through a Likert scale from never to very often by asking "How often do you discuss birth control with [partner]?"	Sexual Division of Power: Behavioral Risk Factors (DePadilla et al., 2011)	Infrequent sexual communication is a risk factor that has been associated with risky sexual behavior and inconsistent condom use (Crosby et al., 2002; Davies et al., 2006; DePadilla et al., 2011).
Age of Partner	Age of sexual partner relative to girl	Having a relationship with an older male was assessed by asking "about how old is [partner]?" This will be recoded to classify partners as younger (less than 17), similar in age (17-21), or older (22 and up).	Cathexis: Social Exposures (DePadilla et al., 2011; Wingood & DiClemente, 2002)	Adolescents with an older partner are less likely to use condoms (K. S. Miller et al., 1997).

Table E.2. Potential girl-level predictors of inconsistent contraception use among 18- and 19-year old African American female students at historically black colleges and universities

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Sexual Abuse	Sexual abuse by a parent or adult caregiver	Has a parent or other adult caregiver touched you in a sexual way, forced you to touch him or her in a sexual way, or force you to have sexual relations?	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	
Coerced sexual activity	Victim was pressured verbally or through intimidation or misuse of authority to consent or acquiesce to sexual activity by someone other than a parent/caregiver (Breiding et al., 2015).	1) "Have you ever been forced, in a non-physical way, to have any type of sexual activity against your will? For example, through verbal pressure, threats of harm or by being given alcohol or drugs?"	Sexual Division of Power: Physical Exposures (DePadilla et al., 2011; Wingood & DiClemente, 2002)	
Forced sexual activity	Victim was physically forced to consent or acquiesce to sexual activity by someone other than a parent/caregiver.	"Have you ever been physically forced to have any type of sexual activity against your will? For example, through the use of hitting (with or without an object), pushing, shaking, burning, or by using physical restraints."	Sexual Division of Power: Physical Exposures (Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Contraceptive Self-Efficacy	The strength of a sexually active adolescent girl's conviction that she should and can control sexual and contraceptive situations to achieve contraception priorities (Levinson et al., 1998).	18-item Contraceptive self-efficacy scale that respondents rate from 1, not at all true of me, to 5, completely true of me. The statements describe situations that involve obtaining contraceptives: utilizing contraceptives with a partner; talking to a partner about contraceptive use; using contraceptives in spite of partner or parental disapproval; interrupting an episode of highly aroused, unplanned sex to talk about (or to use) a contraceptive; acknowledging to another or to one-self the physical aspects of sexuality; and preventing episodes of unprotected sexual intercourse (Levinson et al., 1998).	Sexual Division of Power: Behavioral Risk Factors (DePadilla et al., 2011; Wingood & DiClemente, 2002)	Having limited self-efficacy to negotiate the use of condoms and other contraception is a risk factor for inconsistent contraception use (Alleyne, 2008; Bandura, 1977; Burns & Dillon, 2005; Younge et al., 2013).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Pregnancy Expectations	Desire to become pregnant or avoid pregnancy	Pregnancy expectations were measured using Positive Orientation to Early Motherhood (POEM) scale (Afable-Munsuz et al., 2006). Each of the 8 measures (career, friends, adult, education, trouble, partner, family, and responsible) were measured on a scale of 1–5, indicating the extent of agreement with the statement. Two summary measures can be created from this scale: POEM-goals (a sum of the career, education, and trouble measures) and POEM-support (a sum of the partner and family measures).	Cathexis: Social Exposures (Wingood & DiClemente, 2002)	Having a desire to conceive and being ambivalent toward pregnancy have been found to increase inconsistent contraception use (Bruckner et al., 2004; Chandler et al., 2016; Davies et al., 2006; Frost et al., 2007; Higgins, 2017).
Family Support	Perceived social support adequacy from family	Measured with the Scale of Perceived Social Support (Zimet et al., 1988, 1990). Mean scores will be calculated for family measures.	Cathexis: Social Exposures (Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Peer Support	Perceived social support adequacy from friends	Measured with the Scale of Perceived Social Support (Zimet et al., 1988, 1990). Mean scores will be calculated for friend measures.	Cathexis: Social Exposures (DePadilla et al., 2011)	
Number of Sexual Partners	Total number of sexual partners in the woman's lifetime	How many partners have you ever had vaginal sex with		A prospective study of 375 non-pregnant sexually active African American young women aged 14 to 18 found that adolescents "who were inconsistent contraceptive users at follow-up were more likely to have reported… an increased number of lifetime sexual partners"(Davies et al., 2006).

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Mother's Education Level	Highest level of education completed by the girl's mother	What is the highest level of education your mother completed?		The education level of a girl's mother can influence the relationships within the girl's family and can affect the girl's contraception use (El Bcheraoui et al., 2013; Younge et al., 2013).
Depression	Exhibit symptoms of depression	Center for Epidemiological Studies of Depression Scale (Radloff, 1991); only 10 of 20 questions were asked	Cathexis: Personal Risk Factors (DePadilla et al., 2011; Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Self-esteem	Global self-worth (Fetzer Institute, n.d.)	Self-esteem was measured with the 10-item Rosenberg Self-Esteem Scale (Fetzer Institute, n.d.; Rosenberg, 1965). All items are answered using a 4-point Likert scale format ranging from strongly agree to strongly disagree (Fetzer Institute, n.d.). Scores for all 10 items will be summed, higher scores indicate higher self-esteem (Fetzer Institute, n.d.).	Cathexis: Personal Risk Factors (DePadilla et al., 2011)	
Pregnancy Prevention Knowledge	Knowledge of how pregnancy occurs and how to prevent it	Pregnancy prevention knowledge was measured with nine true/false questions. Scores for all items will be added together with a higher total score indicating higher knowledge of pregnancy prevention.	Cathexis: Personal Risk Factors (DePadilla et al., 2011; Wingood & DiClemente, 2002)	

Predictor	Conceptual Definition	Operational Definition	Theoretical Foundation	Evidence from the Literature
Employment	The number of hours worked per week	Employment status was measured by asking whether participants had a job, and if so, how many hours a week they worked. This will be recoded into three categories: no employment, 20 hours or less per week, and more than 20 hours per week.	Sexual Division of Labor: Economic Exposures (Wingood & DiClemente, 2002)	Underemployment (working less than 20 hours per week) has been associated with inconsistent condom use among female college students (El Bcheraoui et al., 2013; Younge et al., 2013).
Health Insurance	Type of health insurance coverage	Participants were asked, "What kind of health insurance or health care coverage do you currently have?"	Sexual Division of Labor: Economic Exposures (Wingood & DiClemente, 2002)	Adolescent and young adult women in New Orleans report lack of sufficient insurance coverage to be a primary barrier to accessing health care, including contraception (Louisiana Public Health Institute, 2016).

PRELIMINARY ANALYSIS

Table E.3 shows preliminary analysis of the frequency of potential predictors. **Figure E.2** shows the binary distribution of consistent contraception use. Variability in individual differences were explored graphically by estimating the linear predictor for each girl (β_{0j}) and then computing predicted probabilities of contraception use by plugging the linear predictor into the inverse link function: $\mu_{ij} = \frac{1}{1+e^{-\eta_{ij}}}$ (Bauer & Curran, 2018b). The distributions of the linear predictors (β_{0j}) and predicted probabilities (μ_{ij}) were plotted as histograms. The plot of β_{0j} (see **Figure E.3**) shows variability in the linear predictor, which is not distributed normally (the distribution of the linear predictor is shown by the red "kernel" line). The plot of μ_{ij} (see **Figure E.4**) shows a fair amount of variability in the probability that a female HBCU student will use contraception with a male sexual partner.

Table E.3. Frequency of potential predictors of inconsistent contraception use among 18- and 19-year old African American female students at historically black colleges and universities

Predictor	*Baseline Frequency Among HBCU Students*
Partner-level Predictors	
Psychological Aggression (N=274)	142 (51.2%)
Physical Intimate Partner Violence (N=274)	14 (5.1%)
Casual Partnership Type (N=273)	85 (31.1%)
Substance Use Before Sexual Activity (N=275)	67 (24.4%)
Infrequent Communication with Partner (N=256)	135 (52.7%)
Partner 4 Years Older or More (N=270)	38 (14.1%)
Shorter Partnership Length (N=103)	74 (71.8%)
Lower Decision-Making Dominance (N=208)	47 (22.6%)
Individual-level Predictors	
Sexual Abuse (N=275)	17 (6.2%)
Coerced sexual activity (N=275)	51 (18.6%)
Forced sexual activity (N=275)	31 (11.3%)
Low Contraceptive Self-Efficacy (N=271)	113 (41.7%)
Desire to Conceive (N=273)	112 (41.0%)
Low Family Support (N=274)	89 (32.5%)
Low Peer Support (N=275)	61 (22.2%)
Mother Less than High School Education (N=270)	18 (6.7%)
Depressive Symptoms (N=274)	16 (5.8%)
Low Self-esteem (N=273)	115 (42.1%)
Low Pregnancy Prevention Knowledge (N=271)	67 (24.7%)
Work less than 20 hours/week (N=270)	229 (84.8%)
6 or more Sexual Partners (N=260)	63 (24.2%)
No Health Insurance (N=275)	13 (4.7%)

Figure E.2. Distribution of contraception use among 18- and 19-year-old female HBCU students

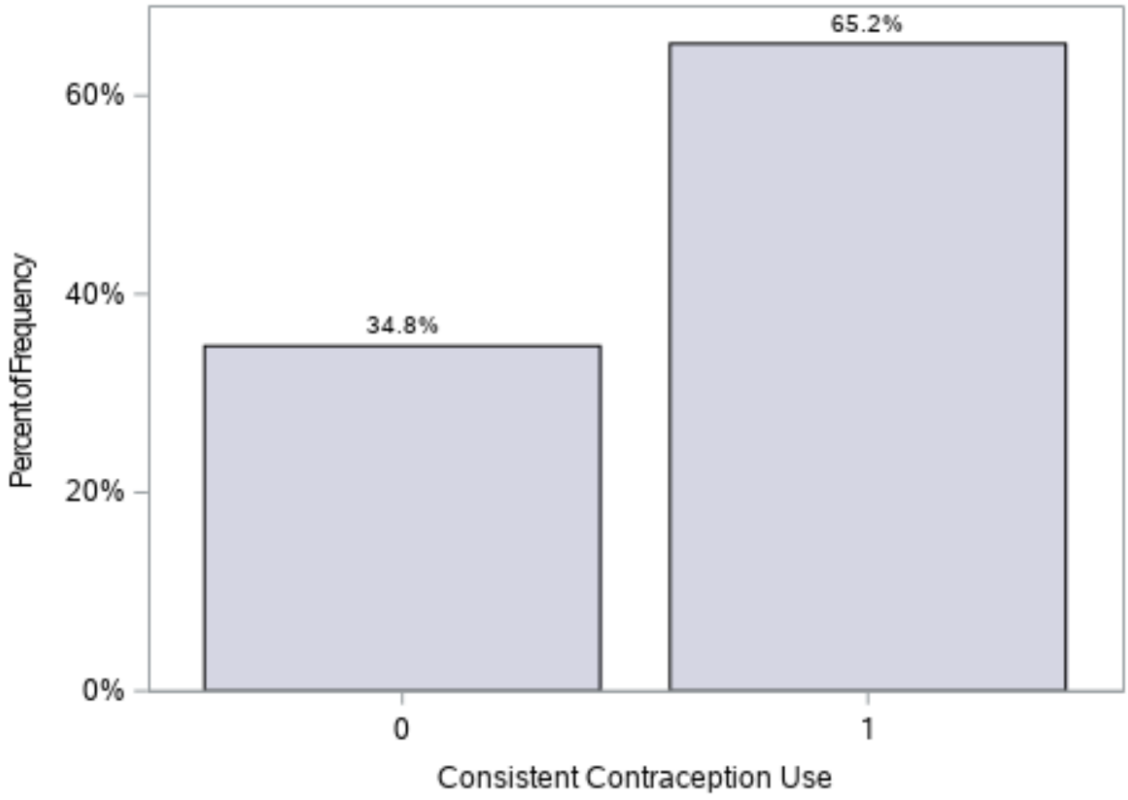


Figure E.3. Distribution of linear predictors

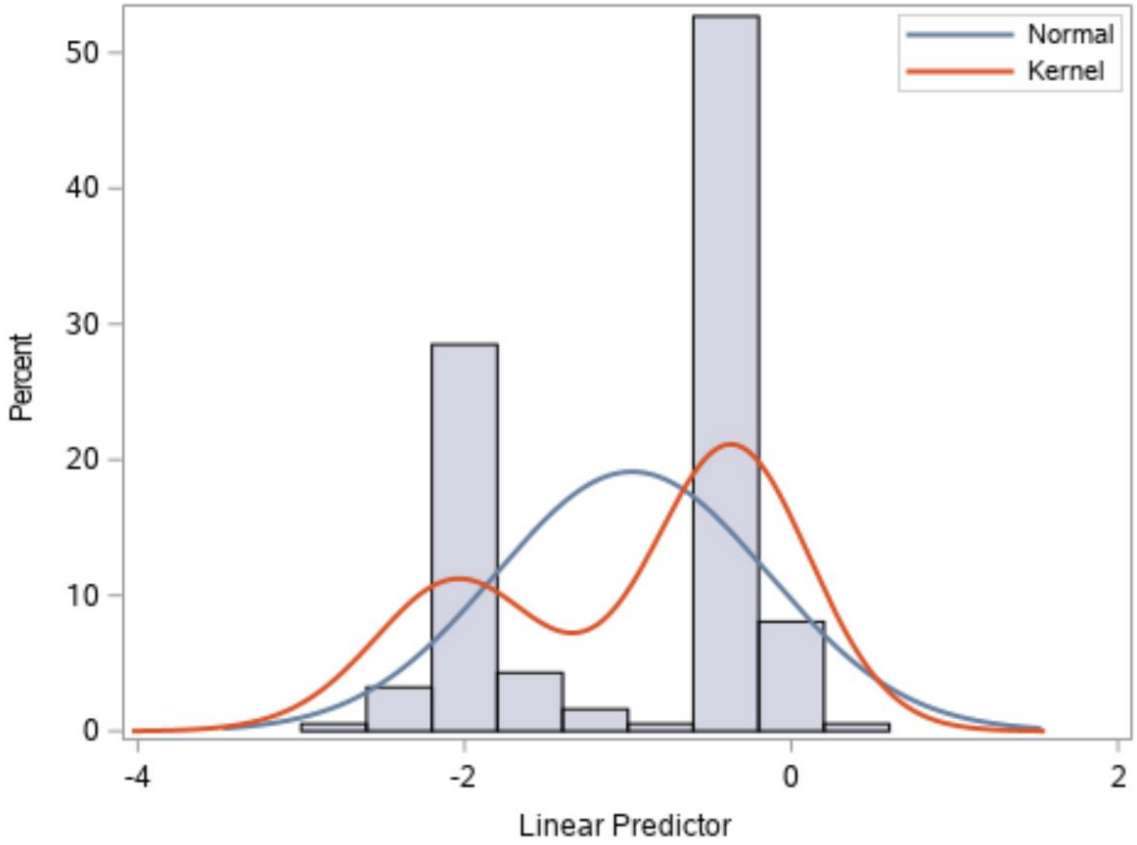
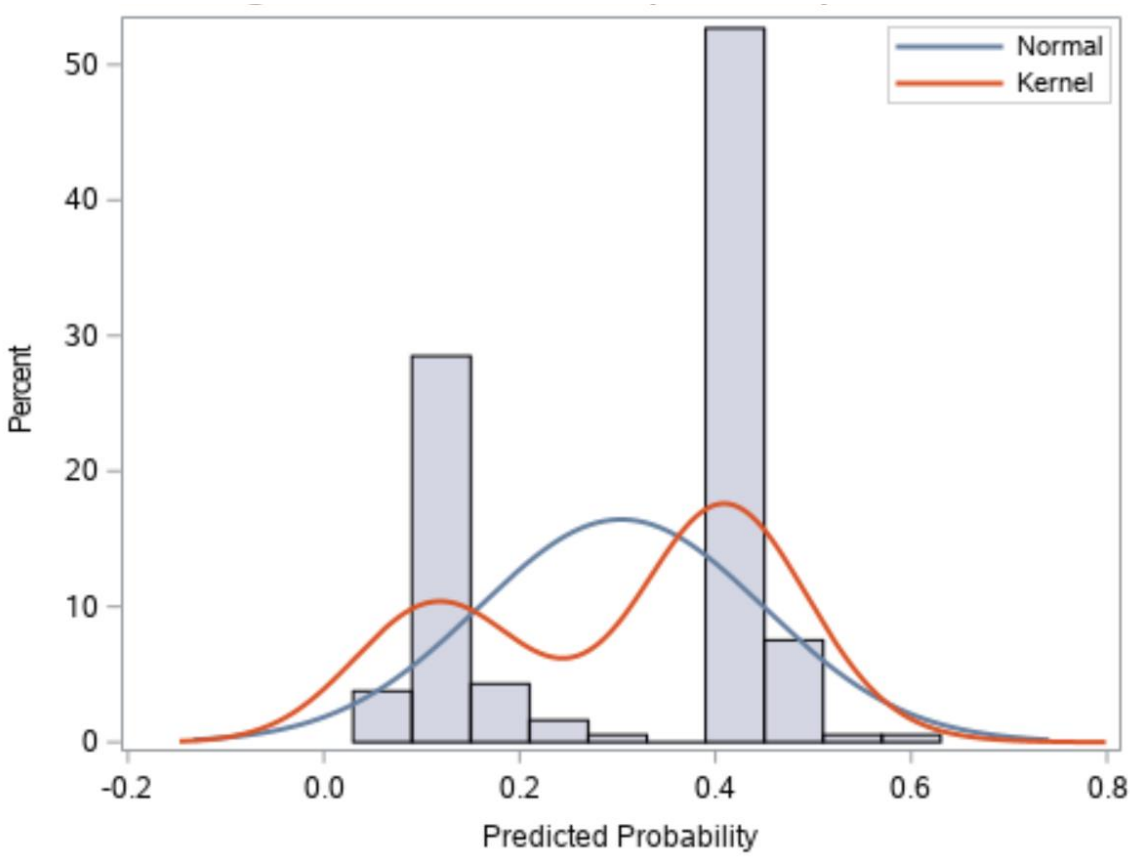


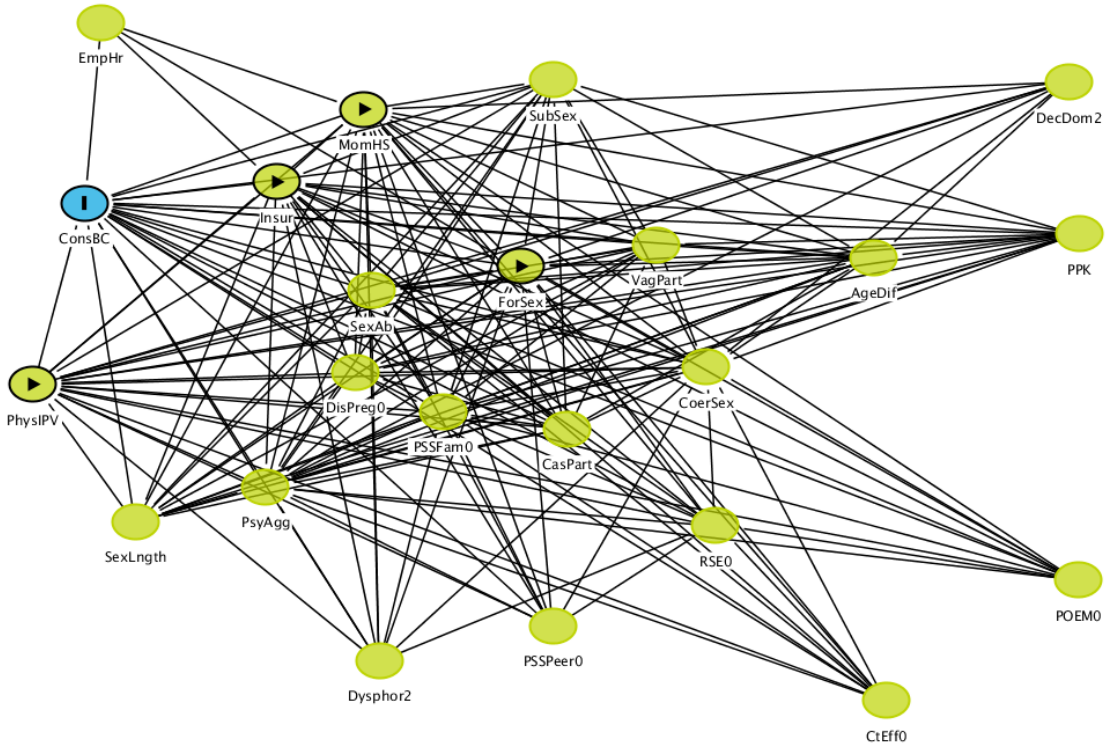
Figure E.4. Distribution of predicted probabilities



MODEL BUILDING

To facilitate interpretation of the intercept and main effects, each predictor was centered such that 0 was a meaningful value. In order to build an accurate statistical model to test the research aim, additional univariate and bivariate descriptive and graphical analysis were conducted to explore the individual predictors and their effects on psychological aggression victimization and the other predictors (Grace-Martin, 2018) **Figure E.5** shows a correlation graph based on the bivariate analysis (Textor, 2015).

Figure E.5. Correlation graph of predictors of inconsistent contraception use among female HBCU students in the greater New Orleans area.



Following univariate and bivariate analysis, a preliminary model was developed based on the correlation in the directed acyclic graph (**Figure E.1**). Decision-making power and lifetime sexual partners were not included due to substantial missing data (StatisticsSolutions, 2019). This model showed no significant main effects. This model was then expanded to include additional potential predictors (age of partner, desire to conceive, family support, peer support, pregnancy prevention knowledge, and hours worked per week). Lack of health insurance was not included due to low prevalence within the sample. Length of partnership was not included due to substantial missing data. This model also showed no significant main effects.

Additional models were developed for physical and social exposures to examine how variables are correlated within each structure of the Theory of Gender and Power (Grace-Martin, 2018; Wingood & DiClemente, 2002). These models also showed no significant main effects. Models were then created and run for the overarching TPG constructs of sexual division of power (combining physical exposures and behavioral risk factors) and cathexis (combining social exposures and personal risk factors). These models also showed no significant main effects.

When a combined model was created that included physical exposures, social exposures, economic exposures, and personal risk factors, there were no significant main effects. This model was expanded by adding behavioral risk factors. The expanded model showed significant estimated main effects of mother's education level. This model was simplified by removing extraneous interaction terms and predictors. The final model consisted of individual level physical exposures, behavioral risk factors, social exposures, and personal risk factors. Linear predictors in the final model are described by **Equation E.1**.

Equation E.1. Linear predictors in final model

Linear Predictors:

$$\eta_{ij} = \beta_{0j}$$

$$\beta_{0j}$$

$$= \gamma_{00} + \gamma_{01} MomEd0_j + \gamma_{02} PSSFam0_j + \gamma_{03} RSE0_j + \gamma_{04} ForSex_j + \gamma_{05} CtEff0_j$$

$$+ \gamma_{06}(MomEd0_j * PSSFam0_j) + \gamma_{07}(RSE0_j * ForSex_j) + \gamma_{08}(ForSex_j * CtEff_j)$$

$$+ \mu_{0j}$$